Medico-Legal Update

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Effects on Quadriceps Muscle Strength Using EMG in Supervised vs Unsupervised Post-Operative Anterior Crucial Ligament Reconstruction

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Abstract
Anterior crucial ligament (ACL) injury is one of the most common ligament injuries in the knee. The ACL injury is the anterior ligament tear or sprain (ACL). The objective of this paper is to compare the effectiveness, recovery rate and the variance in the affected and non-affected limbs muscle strength/activation potential readings of both knees in supervised v/s unsupervised groups of patients after undergone ACL reconstruction surgery at RML Hospital Delhi. The participants were divided into two groups (A-Supervised, and B-Unsupervised) through random sampling. The supervised exercise in group a performed according to the WILK protocol at RML hospital, and un-supervised group B performed the same WILK protocol at home. The method adopted for this study is to compare both Pre-operative and Post-Operative quadriceps(vastus medialis and vastus latralis) EMG readings of the respondents has been recorded using NEURON SPECTRUM 5 using NEUROSOFT Neuro-MEP.NET software at RML Hospital Delhi. The study findings indicated the significant difference in recovery rate as well as the difference in between supervised v/s unsupervised groups i.e. The average pre-operative-VM values of EMG- affected for supervised was 97.1µV, and for unsupervised was 94.2µV and the average post-operative-VM values of EMG for supervised was 130.1µV (36% variance), and for unsupervised was 95.2 µV (1% variance). The average pre-operative-VM values of EMG- normal for supervised was 135.8 µV, and for unsupervised was 139 µV and the average post-operative-VM values of EMG for supervised was 135.1 µV (-7% variance), and for unsupervised was 135.7 µV (-6% variance).

Keywords: Quadriceps; Muscle girth; ACL; EMG; Recovery.

Introduction
The anterior cruciate ligament (ACL) is one of the cruciate pairs in the human knee (the other being the posterior cruciate ligament). The two ligaments are also known as crossed ligaments, as they are arranged in a crossed formation. This name is appropriate as the ACL crosses the rear ligament to form an “X.” This consists of a heavy fibrous fibre which helps to regulate repetitive movement. This is done by restricting the joint’s mobility. The anterior cruciate ligament is one of the four main ligaments of the knee, providing the anterior tibial displacement of 85% of the force of the restraint at 30 degrees and the knee flexion of 90 degrees ¹–⁵. The quadriceps is critical for lowering/reducing limb control during dynamic activity and quadriceps weakness can change movement strategies, which can lead to injury. To prepare patients optimally to return to full activity it is necessary to restore full quadriceps function. Before the severity of quadriceps deficits can be effectively counteracted, however, there must be a deep understanding as to why the weakness of the quadriceps persists throughout recovery. Quadriceps disuse atrophic...
arises after the immobilization of the knee joint and may lead to the weakness of the quadriceps after ACL injury and after reconstruction. Deficits of 3% are 12–18 months post-operative, in volume 6 and cross-sectional area (CSA). Similar amounts of quadriceps atrophy were documented, although no link between atrophy and force was found. The authors concluded that the weakness of quadriceps alone did not lead to incomplete volitional muscle activation.

Atherogenic inhibition of muscles results from an activation of several different joint receptors that function upon the synapses of the inhibitory interneurons on the joint muscle motor neuron pool. Cryotherapy has more “disinhibition” or activation of the VM than the transcutaneous neuromuscular electrical stimulation community of longer-life effects. Disinhibition is defined as “a return of some measure of recruitment to baseline or preinjury levels.”

### Materials and Method

80 patients were selected for participants who volunteered to participate in recent knee surgery. Those who have undergone surgery post-operation after 3 weeks of data collection can take part.; one was omitted following secondary screening and the inclusion criteria alone were not fulfilled. Another person reported for MRI but did not report the CAR test. 80 patients were subjected to semitendinosus graft with the inside out technique of ACL reconstruction of CAL (62 males, 18 females). Medical clarification for the restoration of full activity before reconstruction was given to patients, reported pre-operation screening and assessment ACL reconstruction. Exclusion criteria as following.

1. Any lower extremity injury except recent ACL;
2. Partial or full meniscectomy;
3. Cumulative ligament damage to other ligaments ACL injury; or
4. Common heart conditions. Even pregnant women were excluded.

The volunteer respondents enrolled focused on physical therapy to facilitate postoperative knee rehabilitation through pre-established rehabilitation protocols (WILK). The subjects were seated on a padded table with both knees firmly supported against a wall. At the beginning of the session, the knee girth measurements were carried out at the upper margin of the patella. According to a 10-point visual analogue scale, the pain levels were reported explicitly to measure subjective symptoms during knee operations. At the beginning of each data collection session, a review period was conducted for all subjects. This time the subjects were familiarized with the research procedure and practised the full 3,12,15,16. Joint effusion was measured by lying supine on couch from superior pole of the patella in patients. A tag placed 1 cm near the top pole, and a tape scale was used to measure the circumference of the knee. An average of three MVIC knee extension periods with a minimum of 2 minutes rest between repeating until no torque change was detected by the investigator. and the QAF evaluation was used as a benchmark 4,17,18. The eligible patients underwent anterior reconstruction in cross-ligaments (ACL R) using inside out technique;

### Procedure:

Enrolled volunteers have registered for the study has to undergo measurement of MVIC 2 weeks Pre Operation then 12 to 14 weeks post-operation. Knee rehabilitation with pre-established recovery guidelines for outpatient physical therapy was started. The subjects were seated on a padded table with their backs against a wall completely extended on both legs. At the beginning of each data collection session, a review period was conduct. Maximum voluntary isometric contraction (MVIC) was calculated with the help of the EMG machine for all subjects. This time, the participants were familiarised with the study procedure and the overall MVIC (three to five experimental studies) performed on both the limbs normal and surgical. During three QS trials, EMG measurements of the VM, and VL from the surgical leg were obtained (Figure 1). The subjects were given verbal commands to press the back of their surgical knees as hard as possible into the padded table below their knees before they were ordered to stop. QS Test lasted 5 seconds with a rest of 30 seconds between each test. The subjects were advised to relax as the data was processed. The participants were asked to assess their pain after the three QS tests with a 10 point visual analogue scale using the verbal commands “up,” “push” and “stop,” and were instructed to stretch their knees with full effort for 5 s, with 30 s remaining between two trials. Knee extensor MVIC EMG activity was obtained with the participant lying supine on an examination bed with a foam roller (diameter15cm) placed below the knee to ensure a slight knee flexion. The pelvis was fixated to the examination bed by a non-elastic strap. The hand was placed on top of the lower leg in a distance corresponding to the width of two fingers above the medial malleolus. This procedure has been recorded with
excellent intra-class correlation coefficient (0.929, 95 percent confidence interval [CI] = 0.857–0.966). 36 All MVIC’s lasted 4 secs to allow optimum muscle activity and good verbal encouragement. Three MVIC tests with a 30-second rest between each test were conducted to avoid fatigue build-up for each muscle.

Assessment: Detail assessment was performed according to the assessment Performa measuring the mid-thigh circumference and special tests and strength of the muscle Pre-operation, and post-operation 12 to 14 weeks. WILK protocol was adopted for the strengthening exercise for both the groups for 3 months post-operative.

Quadriceps EMG recording and data analysis: NEURON SPECTRUM 5 using NEUROSOFT Neuro-MEP.NET software surface measurements are carried out. Single differential bar-electrode Ag-AgCl (DE-2.1; Delsys Inc.) were fastened to the medial malleolus of the non-chirurgical body using an electrolyte gel and an adhesive skin interface over a set inter-electrode length of 1 cm 27. EMG data are obtained for the following muscles of the surgical leg: VM (two finger-widths near the superomedial border of the patella along the expected fibre line), and vast lateralis (VL, four finger-widths next to the superolateral border of the patella). Bandpass filters (20–500 Hz) and notch filters (60 Hz) were used. During the maximum voluntary isometric contraction (MVIC) the EMG signal was obtained for 5 s for the monitoring of quadriceps and the knee was extended (isometric effects of the monitored muscles). For each of the muscles, 5-s MVIC root-mean-square (RMS) was tested for three tests in the middle of three seconds. The highest value was then evaluated in the three consecutive trials.

Statistical tests: The SPSS 24 (Statistics System for Social Science) was used for statistical analysis. The paired t-test and was performed, which was having a significance p-value (less than 0.05) 19–21.

Results

Figure 1 and figure 2 showed the data for supervised and Un-supervised groups. The following information was tabulated in the Excel spreadsheets: sex, age, Pre-Operative EMG VL, Pre-Operative EMG VM, Post-Operative EMG VL, and Post-Operative EMG VM for both supervised and unsupervised groups. For affected and Normal leg readings pre and post-operation for both supervised and unsupervised groups. A total of (80) participants were divided into two groups. The findings of the data analysed is mentioned group wise below:

- The average pre-operative-VL values of EMG-affected for supervised was 95.2 µV and for unsupervised was 94.6 µV and the average post-operative-VL values of EMG for supervised was 126.9 µV (32% variance), and for unsupervised was 135.7 µV (43% variance).
- The average pre-operative-VL values of EMG-normal for supervised was 144.5 µV, and for unsupervised was 145 µV and the average post-operative-VL values of EMG for supervised was 133.8 µV (-7% variance), and for unsupervised was 121.4 µV (-16% variance).
- Similarly, the average pre-operative-VM values of EMG-affected for supervised was 97.1 µV, and for unsupervised was 94.2 µV and the average post-operative-VM values of EMG for supervised was 130.1 µV (36% variance), and for unsupervised was 95.2 µV (1% variance).
- The average pre-operative-VM values of EMG-normal for supervised was 135.8 µV, and for unsupervised was 139 µV and the average post-operative-VM values of EMG for supervised was 135.1 µV (-7% variance), and for unsupervised was 135.7 µV (-6% variance) figure 1 and figure 2.
Discussion

Our hypothesis that supervised exercise have a better impact on strengthening and post-operative recovery in comparison with the unsupervised exercises knee surgery leads to an improvement in EMG quadriceps muscles amplitude. We also noted the VM was the muscle in which EMG after surgery that could vary because of atherogenic inhibition of the muscle. Although traditional views and clinical observation suggest that VM is more inhibited after joint injury than other Quadriceps heads, recent findings suggest uniform weakness, atrophy and quadriceps deactivation following joint injury.

The study also showed that due to the unequal strength of both limbs, weight-bearing asymmetry in both limbs would also cause difficulties in dynamic operation. This research also gave us a quantitative meaning in relation to the difference in strength recovered in both groups,
which are also beneficial in the future for the individual to tailor the rehab protocol. The intensity of exercise, as determined in a given percentage of maximum muscle contraction strength, is a fundamental element in muscle strength progression. Surface electromyography (EMG) is also used for indicating exercise intensity as a positive linear association between isometric muscle strength and amplitude was previously reported. In addition, during dynamic muscle contraction, there are positive proportionate relationships between muscle strength and EMG amplitude, although this relationship can be slightly curvilinear in some muscles. Normalizing the EMG amplitude for the average EMG amplitude obtained under isometric conditions improves measurement reliability. Therefore, the standardized EMG (nEMG) amplitude measured as percent of the mean EMG amplitude provides an indicator of exercise strength and is widely used in exercise evaluation studies. Nonetheless, traditional strength training method are still not used in clinical practice and for home-based recovery. One of the key areas of focus in recovery following ACL reconstruction is to implement safe exercises which target quadriceps muscles gradually at appropriate levels of activity. However, reduced lower limb muscle strength is documented, often far beyond post-operative rehabilitation, not only in the quadriceps but also in the hamstring muscles after ACL injury/reconstruction. During strong dynamic movements, hamstrings co-activation is critical for dynamic knee joint stabilisation and excessive prevention.

**Conclusion**

With the above study, the authors concluded that supervised exercises in post-operative ACL reconstruction plays a very significant role in the recovery and also reduces the chances of post-operative complications remarkably.

**Ethical Clearance:** This research was approved by the Ethical committee of Amity University Noida and Dr RML Hospital Delhi. Before participation, all subjects signed informed consent documents and the interests of all subjects are secured.

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Oral Manifestations of Poisons in View of Forensic Odontology-A Review

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Abstract

The aim of this article is to provide an overall view of the literature available about “Poisons” and changes in oral cavity due to poisons. “Oral Cavity” is the first source to identify or analyze the poisonous features and different manifestations observed in postmortem. “Forensic Odontologists” here plays a major role to provide the oral manifestations and diagnosis. The oral cavity can be considered as a region with tremendous potential especially in regard to coming to a final forensic diagnosis. This article revolves around this concept and reviews the different manifestations in the oral cavity observed in post mortem.

Keywords: Poisons, Oral Cavity and Oral Manifestation, Forensic Odontologist.

Introduction

In the field of Forensic the most challenging one is the poison cases. Oral cavity is the major insight for poison consumed cases because it is easy to analyze which type of poison by using the color changes. So, here we are trying to explain the poisons and oral manifestations (ie) clinical or autopsy changes in oral cavity. Law has not tried to define death. The death, in Black’s law dictionary means “cessation of life” or “ceasing to exist.” Medico-legally, death is defined as permanent and irreversible cessation of functions of the three interlinked vital.[1] Oral cavity can be described as a window to changes occurring in the human body; almost all systemic variations show manifestations orally.[2]

Various Sources of Poisons in India:

1. Domestic or household sources: Detergents, disinfectants, antiseptics, insecticides, rodenticides, etc.
2. Agricultural and horticultural sources: Different pesticides, fungicides, and weed killers.
3. Industrial sources: In factories, where poisons are manufactured or poisons are produced as by products.
5. From uses as drugs and medicines: Due to wrong medication, overmedication, and abuse of drugs.
6. Food and drink: Contamination in a way of use of preservatives of food grains or other food material, additives such as coloring and odor agents or other accidental contamination of food and drink.
7. Miscellaneous sources: Snakes bite poisoning, city smoke, sewer gas poisoning, etc.[3]

Classification of Poisons: Poison may be classified in several method, following are 2 sorts during which poison may be classified:

I. Chemical

   Inorganic
   (a) Corrosives
   (b) Metallic and non-metallic salts
Organic
(a) Volatile
(b) Non-volatile, non-alkaloidal
(c) Alkaloidal

II) Physiological/pharmacological

Corrosive
(a) Strong mineral/organic acids
(b) Strong alkalis

Irritant
(a) Metallic
(b) Vegetable
(c) Gas

Commonly Used Poisons in India: Suicidal (KCN, HCL, opium, barbiturates, Organophosphorus), homicidal (arsenic, aconite, thallium, oleander, madar, carbamates). Pesticides are commonly used for self-poisoning. Pesticides are highly toxic and poisoning may be a significant problem in India. In parts of Northern India, aluminum phosphide (AlP) causes most deaths.

Organophosphorus Compound and its Oral Manifestations: Organophosphorus compounds are the overall name for any compound containing phosphorus. OP compounds are widely used for a couple of decades in agriculture for crop protection, pest control & additionally, in veterinary, medical uses and “nerve gases” in chemical operations.

Classification of organophosphorus compounds:

According to their toxicity and clinical use OP compounds are classified as:

1. **Highly toxic OPs**: Agricultural insecticides.
2. **Intermediately toxic OPs**: Animal insecticides.
3. **Low toxicity**: Household application and also in field applications.

Most OPs are highly lipid-soluble agents and are well absorbed from the skin, oral mucous membranes, conjunctiva.

Clinical Manifestation: The onset and severity of symptoms of organophosphate depend upon the precise compound, amount, route of exposure, and rate of metabolic degradation. A person’s can are available contact with OP by various means like ingestion, eating or drinking, inhalation or dermal contact.

Oral Manifestation of OP Poisoning: Most OPs are highly lipid soluble compounds and well absorbed from intact skin, oral mucous membranes, conjunctiva. Most characteristic garlic smell from the mouth.

AlP (Phostoxin, Fumitoxin) And Its Oral Manifestation: AlP is an compound, which is usually used as a fumigant since 1940. It’s utilized for control of pests in buildings (structural fumigation) and also used during processing of products to be imported or exported to stop transfer of exotic organisms. AlP when ingested, liberates of Phosphine gas within the stomach, which features a very pungent smell.

Symptoms of more severe toxicity includes: Individuals after death consuming AlP on external examination during autopsy, face when observed appears to be livid or distinct bluish discoloration. Garlicky pungent odor are often noted in many cases. Froth are often noted round the mouth and/or nose.

Lead Poisoning: Lead (Pb) may be a soft, ductile, bluishgray metal that’s extracted chiefly from galena. Additionally on mouth, it causes astringency & metallic taste. Chronic plumbism results when small amounts of lead are taken in over a extended period.

Oral Manifestation of Lead Poisoning: A “lead hue” of skin with pallor is another feature. A blue line along the gum, with bluish black edging to the teeth is another indication of chronic plumbism. Fig: 1 & 2

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Fig: 1 Shows gingival enlargement
Arsenic Poisoning and Its Oral Manifestation:
Arsenic may be an element that happens in many minerals, mainly combined with sulfur and metals, also it’s commonly used as a semiconductor.[19]

Oral Manifestation of Arsenic Poisoning:
Groundwater contamination by arsenic is a major public health concern worldwide. Chronic exposure to arsenic cause various types of skin lesions including raindrop pigmentation, hyper-pigmentation, hyperkeratosis, squamous cell carcinoma, basal cell carcinoma, and Bowen’s disease.

Signs and symptoms are also found on other tissues of the body including the tongue, gingival, and buccal mucosa.[15] Toxic metals have profound effects on oral health. Melanocytes present in the basal cell layer of the oral mucosa are similar to those found in the skin.[20] The changes are shown (fig 3).

Boric Acid Poisoning and its Oral Manifestation:
Boric acid (BA) is an odorless compound (H3BO3; 5.5% Boron) which can be used as pesticide, water softener and personal care products such as toothpastes & disinfectant. It is also used in high concentrations as pesticide (99% boric acid).[21&22]
External Oral And General Manifestation of Boric Acid Poisoning:

1. At first glance, intense cyanosis of lips and nail beds were evident.
2. Inflammatory changes in oral cavity and brownish stains along with right angle of mouth and right nostril.[23]

Sulphuric Acid Poisoning and its Oral Manifestations: Sulfuric acid is one of the most widely used industrial chemicals. Sulfuric acid is widely used in electrical industry, chemical laboratories, jewelery, and agriculture. The commonest means of intoxication usually takes place through ingestion, acidic vapors are strong irritants to the respiratory mucosa and may cause pulmonary edema in the more severe cases.[24]

Oral Manifestation of sulphuric poisoning:

Insensitive yellowish spongy tongue, gums, buccal mucosa, and palate.[24]

Case Report of Poisoning and Oral Manifestations:

Case 1- Organophosphorous Poisoning:

The first subject was a moderately built, male with approximate age ranging from 30-32 years. Presence of white froth observed in corners of mouth & nose. The eyes characteristic hazy presentation also referred to as glassy appearance. Examination of oral cavity revealed thickening of the oral mucous membranes with mild whitish discoloration, and moderate to intense white discoloration with the attached gingival. The tongue also displayed white patches. (fig 4). [2]

After the Chemical analysis it revealed the cause of death is to be ingestion of organophosphorus compound.[25]

This has three types of effects: (1) muscarinic, (2) nicotinic, and (3) central effects.[26]

Case 2: Sulphuric Acid Poisoning:

A 36-year-old jeweler was admitted to our emergency department 30 minutes after he accidentally ingested highly concentrated solution of sulfuric acid. He suffered immediate cutaneous burns of varying extent and depth on his face, neck, thorax, and abdomen. He had a severe trismus with insensitive yellowish spongy tongue, gums, buccal mucosa, and palate (Fig. 5).[24]

Fig 5: The necrosis of the lips, tongue, and gums is evident.

Case 3: Sulphuric Acid Poisoning:

The second subject was a moderately built female, approximately 17-20 years of age. Various patches exhibiting yellowish discoloration were also present all over the body. Darkening of the skin was observed from the facial region extending till the neck. Swelling of lips was presented along with signs of cyanosis.

Examination of the oral cavity revealed a faint generalized yellowish tinge with the oral mucosa; the teeth exhibited unusually white shade and were brittle in consistency (fig 6). There was moderate to intense yellowish discoloration of the tongue seen. The chemical analysis in this case showed the cause of death to be sulphuric acid poisoning.[2]
The injuries in mouth, throat, esophagus, reversible or irreversible. The damaged mucous membrane, the sub-mucus regenerate only with great difficulty because of the surrounding inflammation and secondary complications.[27] Naik SM et al (2012) reported a case of acute accidental formic acid poisoning and examination of oral cavity revealed intense corrosion of tongue and the oral mucosa.[28] Vijanath V et al (2010) presented a suicide case, consumption of sulphuric acid and the autopsy revealed extensive demarcated cutaneous burns on the inner aspect of the lips.[29]

In a study performed by MalcolD (1961) on the effect of sulphuric acid on the teeth of battery workers observed the initial lesion to be etching of the labial surface of the enamel, giving a dull ground glass appearance barely visible naked eye. The exposed surface of teeth were highly polished or etched & also said that both material alba and calculus dissolved completely from the exposed surfaces in vivo, which shows false presentation of good oral hygiene.[30]

Snakes Poisons and its Oral Manifestations:
Deaths due to bite/sting of a venomous animal accounted for 10.7% of all deaths due to unintentional injuries, with an adjusted mortality rate of 6.2 (95% CI 6.0±6.3) per 100,000 population. By seeing the oral manifestations we can judge and conclude the snake bite.

Oral Manifestations: Spontaneous systemic haemorrhage is most often detected in the gingival sulci. Later the face, palate, jaws, tongue, vocal cords, neck muscles become paralysed, Locally froth formation and Bluish or Blackish discoloration of oral cavity and face.[34]

Case Report of Snake Bite:

Case report 5: 14 years/girl, Respondent: Brother

Brother of the deceased told that his sister had slept at night after dinner. After sometime, someone went to check on her but she was found dead. Her whole body had turned pale and froth was coming from her mouth. Because of the froth, they came to know that a snake had bitten her.

Summary: A general review of this literature showed us many cases with documented post-mortem oral manifestations. The oral cavity can be considered as a region with tremendous untapped potential especially in regard to coming to a final forensic diagnosis, but this aspect of forensic medicine is relatively undiscovered and overlooked. The above cases shed light on the prospects offered by observation of the manifestations of the oral cavity post mortem and their significance in the field of forensic science.[2]

Organophosphorus insecticides appear to be the most commonly ingested pesticides in rural Asia, accounting for around two thirds of cases.[32] Organophosphorus poisoning; after hanging (49%) is known to be the second most common method of suicide in India (40.3%).[33]

Findings from arsenic poisoning suggest that a higher level of urinary arsenic concentration is associated with higher risk of arsenical lesions of gums & tongue. In the present review, we provide further direct evidence that arsenichas stronger association with arsenicosis symptoms of gums & tongue. These findings imply that contamination of drinking water with arsenic might also be a risk factor for arsenicosis of the gums and tongue.[20]
A dead body with erythematous rash, redness of skin, bluish green color of vomitus and fecal matter, corrosive changes in oral & nasal cavity & multiple organ damages can be highly suggestive of Boric Acid poisoning.[23] Sulfuric acid is widely used in electrical industry, chemical laboratories, & agriculture.[24]

**Conclusion**

The main aim of forensic toxicology is that the technology and therefore the techniques that are utilized in obtaining and interpreting the results. The explanation for death could also be achieved after considering all the forensic investigations. The aim of this paper was to report the likelihood of poisoning and the way to interpret the oral manifestation (ie) (Oral Cavity Changes) in perfumes and other household products which will contain this substance.

**Ethical Clearance:** It is just a review article. It does not come under any ethical review.

**Source of Funding:** Self

**Conflict of Interest:** Nil

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18. Link is here


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Knowledge of Nurses Concerning Ventilator-Associated Pneumonia (VAP) Prevention in Mosul Teaching Hospitals

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Lecturer, University of Mosul, College of Nursing, Mosul, Iraq

Abstract

Background: Ventilator-Associated Pneumonia (VAP) is one of the popular Intensive Care Units (ICUs) nosocomial infections with a prevalence rate of ten to seventy percent. The frequency of VAP is about twenty percent. Lack of awareness of VAP standards and the low quality of nursing practice can become a barrier to preventing VAP.

Objective: The purpose of this study is to assess the knowledge of nurses concerning VAP prevention in Mosul teaching Hospitals.

Material and Method: A descriptive design study was used to assess knowledge and sources of knowledge among nurses about VAP prevention. From Mosul Teaching Hospitals picked 200 respondents working in different intensive care areas (ICU, CCU, NICU, and PICU) as a sample for the current study using the accidental sampling approach. A questionnaire developed for nurses have been updated and revised for the purpose of the study. The questionnaire was tested for validity and reliability and passed for use in the present study. Using Microsoft Excel, data coding, entry, cleaning, and analysis were done, and results were presented using standard frequency distribution tables.

Results: In relation to Sociodemographic data of the studied sample is shown in Table 1. The average age of nurses was founded (26.13 ± 4.25) years, and (62.7 %) had a diploma in nursing (secondary schools). Also, the mean experience period was (7.31 ± 3.81) years. The study found that (67%) of Nurses had poor knowledge about pneumonia and VAP. The highest (86%) of nurse’s little knowledge was gained through their practice of nursing in Mosul hospital.

Conclusion: Multieducational and training courses and programs need for nurses to improve their knowledge about prevention of VAP and may decrease Pneumonia associated with Ventilator among patients were concluded in current study.

Keywords: Knowledge, Ventilator, Pneumonia, (VAP).

Introduction

“Ventilator Associated Pneumonia” (VAP) is a nosocomial lung parenchyma infection that occurs more than 48–72 hours after the intubation of a patient and the initiation of mechanical ventilation(1). It is a subtype of Hospital Acquired Pneumonia that occurs in people on mechanical ventilation via an endotracheal or tracheostomy tube for at least 48 hours with 6-20 times higher incidence recorded in these patients(2). Especially in intensive care units (ICUs), where the reality of the diseases, the circumstances of the patient and the type of micro-organisms involved make infections a severe problem(3). Invasive procedures have been the focus of health-associated infection (HAI) epidemiology studies and are known to be common risk factors, such as central venous catheters for bloodstream infections and mechanical ventilation for pneumonia(4-6). Because patients in the Intensive Care Unit (ICU) focus exclusively on the caregivers, the awareness, perceptions, and behaviors implemented by the nurses have a direct impact on patient recovery. Miserably, oral health issues in chronically ill patients are typically overshadowed by other severe needs. There are major effects of chronic illnesses and disorders, leading to
disabilities and a decreased quality of life. Individuals with the most prevalent oral conditions tend to have the highest oral disease rates, associating poor oral health with adverse health effects such as aspiration pneumonia and cardiovascular disease (7-10).

**Aim:** The purpose of this study is to identify knowledge of ventilator-associated pneumonia among critical care nurses.

**Method**

A descriptive design study was used to assess knowledge and sources of knowledge among nurses about VAP prevention. From Mosul Teaching Hospitals picked 200 respondents working in different intensive care areas (ICU, CCU, NICU, and PICU) as a sample for the study using the accidental sampling approach. The questionnaires developed for nurses have been updated and revised by professors of Community Health Nursing and was tested for validity and reliability and passed for use in the present study. The information about sociodemographic profiles of health care professionals in the ICU like age, number of years of experience and past attendance of training courses on infection control were gathered directly from them. Questions to assess the nurse’s knowledge about VAP (what is meaning, risk factors, causes, sources, route of transmission, and mission of infection control as well as Knowledge about recommendations suggested by APIC for reducing associated pneumonia in the ventilator) are arranged and addressed to the participants. The correct answer is marked with (1) and the wrong answer is marked (0). Using Microsoft Excel, data coding, entry, cleaning, and analysis were done, and results were presented using standard frequency distribution tables. Simple proportions have been used to define the numerical and categorical details.

**Results**

The average age of nurses was reported (26.13 ± 4.25) years, and (62.7 percent) had a nursing certificate (secondary schools). The mean period of experience was also (7.31 ± 3.81) years. The study showed that Nurses (67 percent) had no knowledge of pneumonia and VAP. The highest (86 percent) of the little awareness of nurses was gained by their nursing practice at Mosul hospital. The study found that (67%) of Nurses had poor knowledge about pneumonia and VAP. The highest (86%) of nurse’s knowledge was gained through their practice of nursing in Mosul hospital. One of the top barriers to VAP management, having multiple physician groups managing VAP, can lead to poor patient outcomes, particularly due to the increased likelihood of communication errors in multiple providers. (Table 3).

![FIGURE (1): KNOWLEDGE OF NURSES CONCERNING VAP PREVENTION.](image-url)
Table (1): Nurses’ knowledge about pneumonia in details.

<table>
<thead>
<tr>
<th>Nurses knowledge about signs and symptoms of pneumonia</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>58</td>
<td>29%</td>
</tr>
<tr>
<td>Average</td>
<td>48</td>
<td>24%</td>
</tr>
<tr>
<td>Good %</td>
<td>52</td>
<td>26%</td>
</tr>
<tr>
<td>Very good</td>
<td>42</td>
<td>21%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>200</td>
<td>100%</td>
</tr>
<tr>
<td>Chi -Square= 2.72 P-Value= 0.43</td>
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<table>
<thead>
<tr>
<th>Nurses knowledge about complications of pneumonia</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>122</td>
<td>61%</td>
</tr>
<tr>
<td>Average</td>
<td>47</td>
<td>23.5%</td>
</tr>
<tr>
<td>Good</td>
<td>31</td>
<td>15.5%</td>
</tr>
<tr>
<td>Very good</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>200</td>
<td>100%</td>
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<tr>
<td>Chi -Square= 70.81 P-Value= 0.00</td>
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<table>
<thead>
<tr>
<th>Nurses knowledge about causes of pneumonia</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>136</td>
<td>68%</td>
</tr>
<tr>
<td>Average</td>
<td>32</td>
<td>16%</td>
</tr>
<tr>
<td>Good</td>
<td>29</td>
<td>14.5%</td>
</tr>
<tr>
<td>Very good</td>
<td>3</td>
<td>1.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>200</td>
<td>100%</td>
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<td>Chi -Square= 207.80 P-Value= 0.00</td>
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<table>
<thead>
<tr>
<th>Nurses knowledge about measures of reducing incidence of pneumonia:</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>57</td>
<td>28.5%</td>
</tr>
<tr>
<td>Average</td>
<td>30</td>
<td>15%</td>
</tr>
<tr>
<td>Good</td>
<td>61</td>
<td>30.5%</td>
</tr>
<tr>
<td>Very good</td>
<td>52</td>
<td>26%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>200</td>
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<tr>
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</table>

<table>
<thead>
<tr>
<th>Nurses knowledge about chest X-ray findings:</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct answer</td>
<td>149</td>
<td>74.5%</td>
</tr>
<tr>
<td>Incorrect answer</td>
<td>51</td>
<td>25.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>200</td>
<td>100%</td>
</tr>
<tr>
<td>Chi -Square= 48.02 P-Value= 0.00</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Nurses knowledge about severity of pneumonia:</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct answer</td>
<td>58</td>
<td>29%</td>
</tr>
<tr>
<td>Incorrect answer</td>
<td>142</td>
<td>71%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>200</td>
<td>100%</td>
</tr>
<tr>
<td>Chi -Square= 35.28 P-Value= 0.00</td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nurses knowledge about amount of fluid required for patient with pneumonia:</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct answer</td>
<td>69</td>
<td>34.5%</td>
</tr>
<tr>
<td>Incorrect answer</td>
<td>131</td>
<td>65.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>200</td>
<td>100%</td>
</tr>
<tr>
<td>Chi -Square= 19.22 P-Value= 0.00</td>
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</table>
Table (2): Sources of knowledge regarding Pneumonia

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th></th>
<th>%</th>
<th>No</th>
<th></th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you received information about pneumonia during your academic study stage?</td>
<td>184</td>
<td>92%</td>
<td>16</td>
<td>8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did you get information about pneumonia during your practice of nursing in Mosul hospital?</td>
<td>172</td>
<td>86%</td>
<td>28</td>
<td>14%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did you search for information in scientific books and the internet?</td>
<td>80</td>
<td>40%</td>
<td>120</td>
<td>60%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have you participated in scientific courses and seminars that deal with the study of diseases in health institutions and universities?</td>
<td>107</td>
<td>53.5%</td>
<td>93</td>
<td>46.5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (3): List of top-notch VAP performance barriers

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Agree</th>
<th></th>
<th>%</th>
<th>Disagree</th>
<th></th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Having different groups of doctors treating ICU patients complicates the use of the VAP guidelines.</td>
<td>126</td>
<td>63</td>
<td>74</td>
<td>37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>There are differences in the management of VAP between doctors attending and ICU workers</td>
<td>98</td>
<td>47.5</td>
<td>102</td>
<td>52.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICU + renal failure patients complicate the decision-making process when ordering antibiotics.</td>
<td>116</td>
<td>58</td>
<td>84</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is a difference in the control of VAP within the physician service depending upon who is the attending physician of the VAP patient.</td>
<td>94</td>
<td>47</td>
<td>106</td>
<td>53</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discussion

Ventilator-related pneumonia (VAP) is one of the hospital-acquired infections most often found in intensive care units and is related to severe morbidity and high care costs. VAP’s pathophysiology, epidemiology, diagnosis, and prevention have been researched widely for decades, but no specific preventive strategy has yet emerged.

It revealed, according to the result, that bad knowledge respondents are higher than those who had good knowledge. This result comes in agreements with another study. (11) Performed at New Zealand that fond Just 48% of critical care nurses working in New Zealand have some information about pneumonia prevention associated with ventilator nosocomial. Similar to the literature (12-20), The level of information on VAP among nurses was found to be deficient in the present research. Healthcare teams and academics have put in place and tested various approaches aimed at increasing patient health and reducing inhospitable performance.

Health care-associated infections are the most frequent adverse events that threaten patient safety worldwide. About 5% to 15% of patients admitted to intensive care hospitals in developed countries acquire a healthcare-related infection at any time. The risk of developing infection in developing countries is 2 to 20 times higher. Health-associated infections (HAI) pose a danger to the health of patients. CDC offers regional leadership in monitoring, disease investigations, clinical testing and health-associated infection prevention. CDC uses the information gained from these activities to identify infections and establish new approaches to avoid infections associated with the healthcare. CDC and other healthcare agencies’ public health intervention has contributed to changes in clinical practice, medical protocols and the continued development of evidence-based infection control guidelines and advances in prevention. (21-24)

However, given the reported findings, there are variations in knowledge of the evidence and the incorporation of evidence-based recommendations into routine nursing. Often, when implementing patient safety or risk management interventions to address healthcare problems, a simple principle must be considered: matching strategies to the source of the problem. (25,26) Focusing on all mechanisms known to...
cause VAP allows health care providers to carry out successful risk management measures for patients (27,28).

About the definition of ventilator-related pneumonia, the study found that (%) of the nurse defined pneumonia and VAP correctly. This result ties well with previous studies wherein the analysis showed that 90 percent of the research sample responded correctly about ventilator definition, and 66.7 percent responded correctly concerning ventilator-related pneumonia (29). Regarding the signs and risk factors of ventilator-associated pneumonia, the study results of the current study were broadly in line with another study that showed the average knowledge of the respondents about signs of ventilator-associated pneumonia was (33.3%), while the average knowledge of the respondents about risk factors of ventilator-associated pneumonia was (34.6%) (30).

Additionally, this is similar to what was reported in Boston by a study where average knowledge score was (43.28) percent for signs and symptoms of ventilator-associated pneumonia (31). Regarding prevention strategies the results of the current study comes in a similar pattern of results was obtained in another study that showed only 31.9 percent of the research sample replied with correct responses about ventilator-associated pneumonia prevention strategies, while 58.7 percent replied correctly concerning the diagnosis of ventilator-associated pneumonia (32). Regarding understanding the concept of VAP (50 percent) had strong knowledge, regarding risk factor more than one third (36.7 percent), Regarding knowledge of signs and symptoms of VAP (30 percent) had poor knowledge Concerning knowledge of airway type humidifier (55 percent) had poor knowledge, two-thirds (65 percent) of nurses changed humidity. And the majority of nurses (85%) used open suction, had equal knowledge of endotracheal tube forms (81%) (33).

“The recommended oral route is based on the evidence-based guidelines (EBG’s) for the prevention of ventilator-associated pneumonia (VAP). of all the participants, 58(6 9.88%) responded correctly, and 25 (30.12%) responded incorrectly, indicating that nurses know that the oral route is preferred for endotracheal intubation” (34).

The current study indicates the following obstacles to the implementation of VAP-based evidence guidelines: deficiency of resources, no VAP procedure in the unit, and dissatisfaction with the proposed strategy associated with a lack of awareness of the VAP guideline among nurses in Iraq (35).

**Conclusion**

Our study indicates that the awareness of nurses about the guidelines for nosocomial pneumonia is not sufficient and highlight the necessity for thorough training and education.

**Acknowledgements:** The researchers express their gratitude to the 200 nurses serving in teaching Hospitals of Mosul City and especially whose work in ICUs.

**Conflict of Interests:** No conflict of interest is declared.

**Ethical Clearance:** Taken from Nineveh Health Directorate- ethical Research committee

**Source of Funding:** Self

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Social Gain or Social Pain: Subjective Socio-economic Status, Income and Attitudes towards Social Relations

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Abstract

Social pain is usually defined as the experience of pain because of interpersonal rejection or loss. The aim of this study was to find out the peculiarities of attitudes towards social relations in different groups of income and perceived socio-economic status in a representative sample of Lithuanian population (n=1001). We have found that mean ranks in the lowest-income quintile, agreeing that “my relationships are supportive and rewarding”, were almost twice lower than in the highest-income quintile. A similar tendency was observed with the statements “I actively contribute to the happiness and well-being of others” and “People respect me”. Mean ranks in the subjectively poorest group regarding perceived respect from people were almost three times lower than in the subjectively rich group. It appears that having low income and low subjective socio-economic status may harm psychological well-being. Our study raises concern regarding societal well-being: we suggest that in order to achieve the prosperity of society, it is necessary to reduce socio-economic inequalities and through various programs and projects strengthen people’s ability to establish and maintain supportive, compassionate social contacts.

Keywords: Subjective perceptions, public administration, social relationships, social connections.

Introduction

Interest in the influence of social relationships on psychological well-being has a long history, starting with works of E. Durkheim (1897/1951), J. Bowlby (1969) and many others. Recently, researchers worldwide have investigated positive as well as challenging aspects of social relationships, including social power,¹ social class,² or aggression.³ Some researchers have suggested central role of morality in social connections and revealed that supportive social relations reduce the adverse consequences of a wide variety of stressful life events, contributes to psychological well-being irrespective of the level of life stress, and may enhance overall subjective well-being.⁴ Some researchers investigated whether low (vs. high) subjective socioeconomic status increase both prosociality and aggression,⁵ and some have found that we choose our social ties because of their capacity to provide rewards relative to costs, and our choices lead to construct social networks composed predominantly of rewarding social ties. Person perception studies show that negative information about others has higher impact than positive information, and unpleasant encounters with bureaucracies are far more predictive of clients’ overall evaluation of services provided than are pleasant encounters.

Research on societal quality of life has established social relationships as extremely important factor in the psychological well-being of society. Researchers argue that we are “social animals” who, through relationships with others, can experience the joy of life, discover the meaning of life, as other people are the most important objects in our world.⁶ If one succeeds in establishing and managing social relationships in a qualitative manner, it may determine the ability to experience the fullness of life.⁷ ⁸ In addition, relationships with other people are reflected in best life experiences.⁹

Research shows that social relationships are better predictors of our own well-being than higher income: “people are firmly anchored in social networks, and
person’s health and well-being affects the health and well-being of another human because happiness is not the happiness of isolated individuals. Social relationships also link to mental and physical health: individuals living alone or having no close friends are twice as likely to suffer from cardiovascular disease; they are more likely to have infectious or respiratory diseases. Quality of social connections determines the speed of wound healing: if a person has very poor quality social relationships, wounds heal twice slower than in a group of people having supporting and satisfactory social relationships. Deprived social connections relates to social exclusion: exclusion means that a person is geographically present in a society but cannot participate actively as other citizens. Research has shown that in some countries poor people, especially children or youth, may suffer social exclusion or stigma and related bullying. Due to a lack of material resources, some people may not be able to get proper education and achieve their goals in the labour market.

For decades, researchers have been interested in how exclusion affects person’s social relationships, or whether being the poorest member of society results in social stigma and consequent social pain. This research is extremely important as it demonstrates that social pain could also arise from social comparisons, perceptions regarding personal income or socio-economic status, and not only because of interpersonal rejection or loss. Research has also demonstrated positive value of personal initiative to be an active member of society. Some researchers revealed that not only qualitative social relationships, but also any contribution to society can increase quality of life: altruistic social behaviour, community engagement and group assistance aimed at helping others positively links to longevity, help overcome stress and negative emotions.

By magnetic resonance, neurobiologists have found that some parts of the brain activate at the time we receive money so that we experience pleasure. However, when we give money to other people for charitable purposes, our brain activates in a way that gives us even more pleasure. Thus, social relationships are crucial to the quality of life. According to research, many people in the world suffer from low self-esteem and lack of willingness to live, which can lead to their diminished economic value. In order to make effective public administration or social policy decisions, it is important to clarify factors possibly related to people’s economic value and societal wellbeing. This study aimed at analysing Lithuanian population attitudes towards social relationships in different income and perceived socio-economic status groups. We hypothesised that income or perceived socio-economic status relates to different attitudes towards social relations.

**Materials and Method**

The study of Lithuanian population was carried out by multilevel probability sampling. The overall number of respondents was 1001. To measure attitudes towards social relationships, we used Psychological Flourishing scale created by Ed Diener. The Flourishing Scale is a brief 8-item summary measure of the respondent’s self-perceived success in important areas such as relationships, self-esteem, purpose, and optimism. The scale provides a single psychological well-being score. However, we have selected 3 items for this survey: “People respect me”; “My social relationships are supportive and rewarding”; “I actively contribute to the happiness and well-being of others”.

Objective and subjective indicators relate to socio-economic status. Objective indicators include, for example, personal income, and subjective indicators include, for example, perceived socio-economic stratification. We evaluated the objective socio-economic status according to the person’s income. We subdivided the study sample into income quintiles. In the lowest income group, quintile Q1, there were 17.2 percent of the respondents. In Q2, the second quintile, there were 19.9 percent, in Q3, the third quintile, there were 24.9 percent, in Q4, the fourth quintile, there were 19.4 percent, and in Q5, the fifth quintile, the highest income group, there were 18.7 percent of respondents.

Because the data were distributed asymmetrically across the groups, non-parametric statistics were used to analyse the data, and Kruskal-Wallis independent sample intergroup comparisons were performed. The limitations of this part of the analysis are, of course, the specifics that other assets or debts of the individual were not taken into account, because the income received monthly does not necessarily reflect the actual economic situation of the individual.

In this study we aimed to evaluate the role of subjective socio-economic stratification, therefore we have also analysed subjective socio-economic status assessment. We applied the modified Subjective Social Class Measure, which measures a person’s subjective socio-economic status, and based on the results, we divided the respondents into 5 groups:
– affiliating themselves with the wealthy, who live a rich and privileged life, who have a lot of money and feel themselves as VIP;
– assigning themselves to the middle class who have enough money to live a normal life;
– assigning themselves to the middle class, who sometimes have limited amounts of money;
– affiliating themselves with the poor, who have no money for a normal life;
– assigning themselves to the poorest of the poor who do not have the money for basic everyday needs.

According to the subjective assessment of the socio-economic situation, only one person attributed himself to the rich, so we did not investigate this further. As the remaining four groups were distributed asymmetrically, non-parametric statistics were used to analyze the data, and Kruskal-Wallis independent sample intergroup comparisons were performed.

### Results and Discussion

To determine whether groups of different income quintiles differ in their attitudes towards social relationships, we performed Kruskal-Wallis cross-group comparisons of independent samples. The results of the study showed statistically significant differences in attitudes towards social relationships between different groups of income quintiles (Table 1). Mean ranks in the lowest-income quintile Q1, agreeing that “my relationships are supportive and rewarding”, were almost twice lower than in the highest-income quintile Q5 (H (2) = 127.585, p = 0.000). A similar tendency is observed for the statement “I actively contribute to the happiness and well-being of others”, with mean ranks in the lowest income quintile Q1 being almost twice lower than in the highest income quintile Q5 (H (2) = 110.829, p = 0.000).

<table>
<thead>
<tr>
<th>Income quintiles</th>
<th>N</th>
<th>Mean ranks</th>
<th>H (2)</th>
<th>Chi square</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>“My social relationships are supportive and rewarding”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q1</td>
<td>172</td>
<td>357.18</td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Q2</td>
<td>199</td>
<td>453.67</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q3</td>
<td>249</td>
<td>474.18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q4</td>
<td>194</td>
<td>545.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q5</td>
<td>187</td>
<td>673.61</td>
<td>127.585</td>
<td>4</td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>“I actively contribute to the happiness and well-being of others”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q1</td>
<td>172</td>
<td>356.19</td>
<td></td>
<td></td>
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<tr>
<td>Q2</td>
<td>199</td>
<td>451.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Q3</td>
<td>249</td>
<td>487.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q4</td>
<td>194</td>
<td>556.18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q5</td>
<td>187</td>
<td>648.54</td>
<td>110.829</td>
<td>4</td>
<td></td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

To find out whether subjective stratification, self-attribution to different socio-economic status groups is associated with different evaluations of the quality of social relationships, we performed Kruskal-Wallis cross-group comparisons of independent samples. As shown in Table 2, the results of the study indicated statistically significant differences between the different groups of subjective socio-economic stratification. The mean ranks in the subjectively poorest group, agreeing that “my relationships are supportive and rewarding”, were almost three times lower than in the subjectively rich group (H (2) = 130.374, p = 0.000). A similar tendency is observed for the statement “I actively contribute to the happiness and well-being of other people” – the average ranks in the subjectively poorest group were almost twice lower than in the subjectively rich group (H (2) = 111.070, p = 0.000).

To find out whether groups of different income quintiles differ in perceived respect from people, we
performed Kruskal-Wallis cross-group comparisons of independent samples. As we can see in Table 3, the results of the study showed statistically significant differences in perceived respect from people among different income quintile groups. Mean ranks in the lowest-income quintile Q1, agreeing that “people respect me”, were almost twice lower than in the highest-income quintile Q5 (H (2) = 69.904, p = 0.000).

Table 2. Intergroup comparisons of subjective socioeconomic stratification by attitudes to others, Kruskal-Wallis Test (n = 998)

<table>
<thead>
<tr>
<th>Subjective socio-economic stratification</th>
<th>N</th>
<th>Mean ranks</th>
<th>H (2) Chi square</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>“My social relationships are supportive and rewarding”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle class, enough money</td>
<td>125</td>
<td>612.76</td>
<td>130.374</td>
<td>3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Middle class, not enough money</td>
<td>552</td>
<td>554.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor, not enough money</td>
<td>276</td>
<td>381.07</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poorest of the poor</td>
<td>45</td>
<td>235.32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“I actively contribute to the happiness and well-being of others”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle class, enough money</td>
<td>125</td>
<td>578.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle class, not enough money</td>
<td>552</td>
<td>554.43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor, not enough money</td>
<td>276</td>
<td>399.88</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poorest of the poor</td>
<td>45</td>
<td>217.04</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To find out whether subjective stratification, self-attribution to different socio-economic status groups is associated with different evaluations of perceived respect from people, we performed Kruskal-Wallis cross-group comparisons of independent samples. As we can see in Table 4, the results of the study showed statistically significant differences in perceived respect for people among the different groups of subjective socio-economic stratification (H (2) = 78.111, p = 0.000), with mean ranks in the subjectively poorest group almost twice lower than in the subjectively rich group.

Table 3. Intergroup comparisons of income quintile independent samples by perceived respect from people, Kruskal-Wallis test (n = 1001)

<table>
<thead>
<tr>
<th>Income quintiles</th>
<th>N</th>
<th>Mean ranks</th>
<th>H (2) Chi square</th>
<th>Df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>172</td>
<td>385.05</td>
<td>69.904</td>
<td>4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Q2</td>
<td>199</td>
<td>474.41</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Q3</td>
<td>249</td>
<td>480.99</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q4</td>
<td>194</td>
<td>548.29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q5</td>
<td>187</td>
<td>613.54</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Inter-group comparisons of subjective socio-economic stratification by perceived respect from people, Kruskal-Wallis test (n = 998)

<table>
<thead>
<tr>
<th>Subjective socio-economic stratification</th>
<th>N</th>
<th>Mean ranks</th>
<th>H (2) Chi square</th>
<th>Df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>“People respect me”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle class, enough money</td>
<td>125</td>
<td>552.73</td>
<td>78.111</td>
<td>3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Middle class, not enough money</td>
<td>552</td>
<td>547.64</td>
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<tr>
<td>Poor, not enough money</td>
<td>276</td>
<td>417.03</td>
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<td></td>
<td></td>
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<tr>
<td>Poorest of the poor</td>
<td>45</td>
<td>266.90</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
To sum up, the Lithuanian population’s survey revealed statistically significant differences in attitudes towards social relationships between different income quintile groups. In the Lithuanian population, the mean ranks in the lowest income quintile, agreeing that “my relationships are supportive and rewarding”, are almost twice lower than in the highest income quintile. A similar tendency is observed with the statements “I actively contribute to the happiness and well-being of others” and “People respect me”. It appears that having low subjective socio-economic status may harm psychological wellbeing. Our study raises concern regarding societal wellbeing, especially, having in mind some of the studies reporting that lower class participants respond with greater hostile reactions to threat than do upper class participants or that low subjective socio-economic status is related to increased aggression.

**Conclusions**

The results of the study revealed statistically significant differences in attitudes towards social relationships between different income quintile groups. Mean ranks in the lowest-income quintile Q1, agreeing that “my relationships are supportive and rewarding”, were almost twice lower than in the highest-income quintile Q5. A similar tendency observed with the statement “I actively contribute to the happiness and well-being of others”. The results of the study showed statistically significant differences between different groups of subjective socio-economic stratification. Mean ranks in the subjectively poorest group were almost three times lower than in the subjectively rich group. A similar tendency observed with the statement “I actively contribute to the happiness and well-being of others”.

The results of the study showed statistically significant differences in perceived respect from people among different groups of subjective socio-economic stratification, where the average ranks in the subjectively poorest group were almost twice lower than in the subjectively rich group. It appears that having low income and low subjective socio-economic status may harm psychological wellbeing. Our study raises concern regarding societal wellbeing. In order to achieve the prosperity of society, it is necessary to reduce socio-economic inequalities and through various programs and projects strengthen people’s ability to establish and maintain supportive, compassionate social contacts.

**Acknowledgments:** None.

**Conflict of Interest:** There is not conflict of interest.

**Ethical Clearance:** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study. A study was approved by National Ethics Committee for Research in Health of Lithuania, November 27, 2019, No 348621-LK.

**Source of Funding:** Self-funding.

**References**

5. Greitemeyer T., Sagiooglou C. Does low (vs. high) subjective socioeconomic status increase both prosociality and aggression? Social Psychology, 2018, 49(2): 76-87.


Drowsiness Detection Using Eye Blink and Facial Features Image Analysis

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¹Student, ²Professor, Department of Information Technology, Sathyabama Institute of Science and Technology, Chennai, India, ³Senior Lecturer, Department of Computing, UOW Malaysia KDU Penang University College, Malaysia

Abstract

Drowsiness detection and alert system is developed using OpenCV library and deep learning algorithms and implemented with a night vision camera and a computer to detect if a person is drowsy. The system uses a camera to capture the person’s face and eyes to detect fatigue. In such a case where fatigue is detected, a warning signal is issued to alert the person and an SMS to a person related to the victim.

Keywords: EAR (Eye Aspect Ratio), Fatigue, Drowsiness, Blink Detection, SMS alert.

Introduction

Drowsiness is the state of feeling tired or sleepy. It mostly occurs when a person has lack of sleep or is tired. Drowsiness can lead to many other consequences if it is not taken care properly[7,8]. Health wise it might lead to forgetfulness or falling asleep at inappropriate times. Some researchers say Driving drowsy is considered more dangerous than driving on alcohol[2,3]. Drowsiness of a person not only affects the person drowsy; it might also affect the people around them. In a workplace when an employee is drowsy and sleeps, it affects the organization and the person. If the person feels drowsy and sleeps during work, it can lead to any accident, which might interrupt the orderly progress of the work. Drowsiness also may lead to breach of security in many places if the security personnel at work gets drowsy.

Our objective is to provide an alert system to this problem. In this manner the person and the person concerned to the victim can be alerted before it’s late. To accomplish this, we will need a system, which will track the face and eyes of a person to check if drowsy, and sound an alarm to the victim and send an SMS to the person concerned to the victim.

The purpose of this study is to provide a real time monitoring using face and eye detection techniques. The video will capture with camera after all the analysis the victim who is drowsy and the person concerned with the victim will be warned separately.

Proposed Method: Existing drowsiness detection systems are only focused on driver drowsiness but the proposed system can be used for general drowsiness detection and can also send SMS unlike other drowsiness detection system[4,5]. Generally, drowsiness detection systems use different method to analyze drowsiness. Some method use the position of the head to analyze drowsiness, some use yawns to detect drowsiness, and some method use visual information of the eyes to analyze drowsiness [6]. Commonly most algorithms use face and eye movements to detect drowsiness. We propose a system which is cost efficient and has additional features for alerting the person and the person concerned with the victim. Our system finds the face and eye movements from the web camera to determine the state of the person’s eyes and if drowsy. The alert system in this advanced than others since it not only warns the person, it also sends a SMS to the concerned person of the victim.

System Overview: Detection of drowsiness is done using computer vision and deep learning algorithms and Twilio api is used for SMS alert. The architecture is described as shown in Fig 1. The program flow of this projected system is:
A. Algorithms: The proposed system uses a combination of dlib’s library, Eye aspect ratio algorithm[1] and Twilio SMS api.

**Step 1:** Getting input video stream from the webcam.

**Step 2:** Detecting face using dlib’s pre trained hog face detector.

**Step 3:** Apply dlib’s facial landmark predictor on the face and extract eye region.

**Step 4:** Calculating Ear value using the 6 points.

**Step 5:** If Ear threshold value is satisfied go to step 7.

**Step 6:** Go to step 2.

**Step 7:** Alert the person with warning sound and send SMS to the concerned person.

B. Working of the System: The system starts with the initialization process and acquires the face and eyes from the video stream. Then the system performs detection to extract the face and eye regions. For each frame we identify face and get the facial points and the coordinates of the points of eyes from dlib’s facial landmark predictor. After localizing the eyes and finding the points, we compute a value called eye aspect ratio (EAR) [1] to find if the person blinks or not, and check with the threshold if the person has closed the eyes for sufficiently long time to know if drowsy or not? If the value goes below the threshold, we sound an alarm and send a SMS to the concerned person.

C. Eye Aspect Ratio: It is a mathematical formula which gives an elegant solution to find the blinks of a person. After finding the landmarks of the eyes, the 6 (x, y) points are used to compute the aspect ratio between the height and width of the eye. The value of the ‘EAR’[1] value becomes less than 0.1 when the eyes are closed. Equation 1 is used to calculate the ‘EAR’ value using the 6 points (p1, p2, p3, p4, p5, p6) which is depicted in figure 2.

\[
    EAR = \frac{|p2 - p6| + |p3 - p5|}{2|p1 - p4|} \quad ...(1)
\]

This equation (1) finds the vertical and horizontal distance between the eye. The numerator calculates the vertical distance between the eye and denominator computes the horizontal distance between the eye.

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**Fig. 1. Architecture of System Flow**
Fig. 2. Points of eye landmarks

Fig. 2 shows the 6 eye landmark points of the 68 dlib’s facial landmark points detector.

Fig. 3. Visualization of the eye aspect Ratio

Fig. 3 depicts the visualization of the eye aspect ratio when the eyes are open and close. As show in the figure the eye aspect ratio is constant when the eyes are open and is close to zero when the eyes are closed.

Fig. 4. SMS alert sent when user drowsy.

Fig. 4 shows the SMS sent by the system to the concerned person alerting that the user is drowsy.
Results and Observation

The existing Drowsiness detection systems are made and focused on only driver drowsiness and doesn’t provide any additional features to be used in other applications. Drowsiness detection can be used in other applications such as employee monitoring. The proposed system can be implemented in both driver drowsiness system and in employee monitoring with an additional feature which doesn’t just alert the victim (the person being drowsy) but also the concerned person by sending an SMS.

Conclusion

Drowsiness is a very serious issue in many situations. The present systems mainly concentrate on driver drowsiness and only alerts the driver or the person drowsy. Our proposed system is a general-purpose drowsiness detection system which can not only be used for driver drowsiness detection but can also be used to check employee’s activity and it can also be used to send SMS to the concerned person and alert the person who is drowsy. Our system is fairly straightforward. A camera is setup to find faces. After finding face we send the bounding box of face to find the eye region using facial landmark algorithm. The eye aspect ratio is computed and if the video segments average ear value exceeds the threshold value, we infer as the person is drowsy and send SMS to the concerned person and alert the person who is drowsy. This system can be further expanded with features like mobile use identification to find if the user is using phone and it can be improved to identify drowsiness in different cases such as, When the person is wearing shades.

Ethical Clearance: No ethical clearance required

Source of Funding: Self

Conflict of Interest: Nil

References

Serum α–Amylase Level in Sudanese Patients with Long Standing Diabetes Mellitus Type 2 in Khartoum State, Central Sudan

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Abstract

Objectives: To evaluate and correlate the serum activity of α-amylase in Sudanese patients with type 2 long standing diabetes mellitus.

Methodology: This is a descriptive, cross- sectional, hospital based, case- control study was done in fifty patients (twenty male & thirty female) above forty years with long period diabetes mellitus type 2 referred to Jabber Abu Eliz Diabetes Center and Bahri Diabetes Center in Khartoum state in central Sudan within six months. Thirty healthy volunteers with matching age and sex and socioeconomic status were included. Data was collected through, clinical evaluation form, questionnaire, and laboratory investigations. Serum concentrations of α- amylase were measured by spectrophotometer and t test and correlation were used in statistical analysis for the comparison between test and control group for example: control group.

Results: The result showed a significant difference between the mean of serum α- amylase of the control group compared with that of the test group (Mean ±SD): (39.83±9.0) versus (32.22±13.5) U/L respectively, (P<0.05). Also, there wasa significant positive correlation between the levels of α- amylase and the duration of diabetes mellitus. Correlation coefficient (r) = (r = 0.27, P= 0.000) for example: 0.0000.

Conclusion: From this study it was concluded that; the diminution of the serum levels of α- amylase could be part of the exocrine pancreatic insufficiency since α- amylase activity decline correlated well with the duration of long-standing type 2 Diabetes Mellitus.

Keywords: α-amylase, Diabetes Mellitus, Pancreas exocrine Insufficiency.

Introduction

Diabetes mellitus is a common metabolic disease that is characterized by mis regulation of blood glucose levels leading to hyperglycemia¹². The disease affects millions of people worldwide and the number of people affected by diabetes is increasing³. The prevalence of diabetes is high among Middle Eastern and North African countries with frequencies between 4% and 10%⁴. Diabetes is associated with several complications that include renal deteriorations, retinopathy leading to vision disturbance, nerve damage and predisposition to cardiovascular diseases. Globally, the statistics are

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staggering. Diabetes is the third leading cause of death in the United States after heart disease and cancer[5].

Type 2 diabetes was previously called non–insulin dependent diabetes mellitus or adult-onset diabetes because the peak age of onset is usually later than type 1 diabetes. In adults, type 2 diabetes accounts for about 90% to 95% of all diagnosed cases of diabetes. Type 2 diabetes usually begins with insulin resistance, a disorder in which the cells primarily within the muscles, liver, and fat tissue do not use insulin properly[6].

Since the tight control of enzyme activity is essential for homeostasis, any malfunction (mutation, overproduction, underproduction or deletion) of a single critical enzyme can lead to a genetic disease. The importance of enzymes is shown by the fact that a lethal illness can be caused by the malfunction of just one enzyme out of the thousands of enzymes present in our bodies[7].

α- amylase is marked increase (five to 10 times the upper reference limit) in acute pancreatitis; severe glomerular impairment; severe diabetic ketoacidosis and moderate increase (up to five times the upper reference limit) in acute abdominal disorders as perforated peptic ulcer and salivary gland disorders, Mumps, salivary calculi and myocardial infarction (occasionally), renal failure — due to reduced excretion[7].

There is a significant reduction in pancreatic outputs of amylase, trypsin, chemotropism, and to a lesser degree, bicarbonate in patients with long standing type 2 diabetes mellitus. Clinical evidence of disease of the exocrine pancreas was missing. There was no discernible relationship between the abnormality of external pancreatic function and the duration of diabetes mellitus[6]. In Type 2 diabetes mellitus, there are defects in secretion and signaling of insulin. These defects may also affect the exocrine pancreatic activity[7].

**Materials and Method**

**Setting and participants:** This study was carried out in Khartoum state in central Sudan. The subjects were selected in Khartoum city randomly. The data obtained from different sites in Khartoum city: Khartoum and Khartoum north (Bahri). The study was conducted for three months.

Fifty patients (Twenty male &Thirty female) above forty years with long standing diabetes mellitus (more than ten years), were selected after taking their consent. Each volunteer in this study was asked to come to Jabber Abu Eliz Diabetes Center in Khartoum and Bahri Diabetes Center for medical assessment and sample collection. Thirty healthy subjects (Twelve males, eighteen females) were selected as a control group who were age, sex and socioeconomic status matched to the diabetic group (test group) Clinical data was obtained from the patient’s history and recorded on a questionnaire sheet. Clinical assessment of the study group was done by a medical doctor and they were not suffering from acute pancreatitis or salivary gland disorders which led to increase α- amylase level.

**Data collection Procedure:** After informed consent, venous blood sample (5 ml) was collected from the study subjects. After blood clotting, the samples were centrifuged within 20 minutes after collection at 3000 rpm for 5 minutes and the sera were stored -20°C until analysis. The serum was allowed to reach the room temperature and α- amylase specific activity was measured spectrophotometrically in the direction of 2-chloro-4-nitrophenol formation at 405 nm wavelength using α- amylase kits from Biosystem Company Costa Brava, 30, Barcelona (Spain).

**Quality control:** Control serum of known α-amylase value was used to verify the performance of the measurement procedure.

**Statistical analysis:** The data collected in this study were analyzed by using SPSS computer program package. The mean and standard deviations of α-amylase were used to compare between the test group and the control group. The P values were obtained using the (t) test. Correlation between the serum levels of α-amylase and the duration of the disease were tested using Pearson correlation. Pvalues<0.05 were considered to be statistically significant Pvalues<0.01 were considered highly significant.

**Observation and Results**

**Serum α- amylase:** The following table shows a significant difference between the mean of serum α-amylase of the control group compared with that of the test group (Mean ±SD): (39.83 ±9.0) versus (32.22 ±13.5) U/L, (P<0.05).

Independent sample t-test was used for comparison.
Table 1. Comparison of the means of serum α- amylase of the control group and the test group.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control group Non-diabetic n=30</th>
<th>Test group Diabetic n=50</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serumα- amylase (U/l) Range</td>
<td>39.83 ± 9.0 (20 - 98)</td>
<td>32.22± 13.5 (18 - 82)</td>
<td>&lt; 0.05</td>
</tr>
</tbody>
</table>

The table shows the mean ± SD, range in brackets () and probability (P).

![Figure 1. A scatter plot shows correlation between the serum α-amylase levels and duration of the disease (r = 0.27, P= 0.000).](image)

**Discussion**

In Sudan, there were a great number of published study regarding diabetes mellitus but infrequent related published data regarding the serum levels of α- amylase enzyme in Sudanese with long standing type 2 diabetes mellitus, so this study have a tendency to compare the results with that obtained in other previous studies in none Sudanese people.

This study showed a significant difference between the mean of the serum levels of α- amylase of the test group when compared with that of the control group, the mean of the test group is significantly reduced as shown in table 1(P<0.05). This may be due to the effect of long-standing type 2 diabetes mellitus on pancreatic exocrine function. The above results agree with a study done by Matteo Piciucchi et al.[8] who were found a significant reduction in pancreatic outputs of amylase, trypsin, chemotropism, and to a lesser degree, bicarbonate in patients with long standing type 2 diabetes mellitus. Clinical evidence of disease of the exocrine pancreas was missing.

Also, there was a significant positive correlation between the serum levels of α- amylase and the duration of the disease (in years). (Figure 1) and this may be by reason of enzyme utilization in carbohydrates digestion
and to the pancreatic exocrine insufficiency. In a study done by Vishwanath, et al. [9] on patients with long standing diabetes mellitus, they found that the reduction in serum amylase in type 2 diabetes was more in patients with longer duration of illness (59%) and in patients with low serum insulin values (79%). An association between reduced level of serum amylase and reduced levels of lipase was found in type 2 DM was due to decrease of exocrine acinar cells.

**Conclusion**

This study concluded that the serum activity of α- amylose is reduced in patients with long standing diabetes mellitus type 2 with a considerable constructive correlation with the duration of the Diabetes Mellitus. The repercussion that; analysis of serum pancreatic enzymes could be supplementary informative parameter for the reflection of chronic and progression of the disease.

**Conflict of Interest:** The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

**Source of Funding:** Self-funding.

**Ethical Clearance:** Researchers had care of ethics required in research as this study was completed in accordance with the Helsinki Declaration. Written informed consent was obtained from all subjects before the data collection of the study.

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7. Chathurika W, Vidanarachchi JK. MICROBIOLOGICAL CHANGES DURING PROCESSING AND SHELF LIFE IN ULTRA HIGH TEMPERATURE MILK. In: 7 th YSF SYMPOSIUM. 2018: 34.
Serum Calcium and Serum Alkaline Phosphatase Levels and their Correlations with Disease Activity in Patients with Rheumatoid Arthritis

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¹Prof., ²FIBMS (Rheumatology And Medical Rehabilitation), University of Baghdad, Collage of Medicine, Medical City, Baghdad Teaching Hospital.

Abstract

Rheumatoid Arthritis is a systemic autoimmune disease, characterized by chronic synovial inflammation leading to joint destruction and bone erosion. Metabolic changes have been studied in rheumatoid arthritis, with several studies reported decrease in serum calcium, and increase in serum alkaline phosphatase in rheumatoid arthritis patients in comparison to healthy individuals. This study has been undertaken to evaluate serum calcium and serum alkaline phosphatase levels in patients with rheumatoid arthritis, and their correlation with disease activity. A total of 100 patients with rheumatoid arthritis were enrolled in the study and compared with 50 healthy controls (46 female: 4 male) matched for age and sex. No significant differences have been noticed in mean values of serum calcium, corrected calcium, and serum alkaline phosphatase in patients with rheumatoid arthritis and healthy controls. The mean values of serum calcium, corrected calcium and serum alkaline phosphatase levels were slightly higher with moderate and high disease activity in comparison to low disease activity in patients with rheumatoid arthritis, but the differences did not reach the statistical significance.

Keywords: Rheumatoid Arthritis, Serum Calcium. Alkaline Phosphatase.

Introduction

Rheumatoid Arthritis (RA) is a chronic systemic inflammatory disease, affecting all ethnic groups throughout the world, characterized by chronic synovial inflammation, leading to joint destruction and bone erosions¹². The prevalence of RA is from 0.5% to 1% of the general population worldwide, with female: male ratio of 3:1³⁴. The diagnosis of RA is chiefly based on the clinical features, radiological findings and laboratory results⁵. The classification of RA is based on 2010 ACR/EULAR Classification Criteria for RA⁶. Clinical Disease Activity Index (CDAI) is a new simple tool for measurement of disease activity in RA⁷. Disease Activity Score of 28 joints (DAS28) is another common tool used to assess disease activity in RA⁸. Calcium is an essential element for various biological processes from fertilization to death. The serum calcium is divided into three fractions: 50% of calcium ions in the active form, 40% bound to serum proteins, principally albumin, and 10% bound to anions such as bicarbonate and citrate⁹. Calcium has numerous functions, including: controlling ions transport across cell membranes, acting as an intracellular second messenger, activation of blood coagulation factors, coupling neuromuscular excitation and providing the strength of bones and teeth¹⁰¹¹. Alteration of protein levels, can cause changes in total calcium without affecting ionized calcium physiologically or clinically, thus, the total calcium adjustment to albumin is very important when trying to determine the value of normal calcium⁹. Alkaline Phosphatase (ALP) presents in the plasma membrane of Osteoblasts and in the cells of the liver, kidney, intestine, spleen and placenta¹². Alkaline phosphatase is involved in mineralization, possibly by catalyzing the formation of phosphate from pyrophosphate. In the gut, there is an evidence of having a role in lipid transport¹³. Several studies reported that serum calcium level is decreased and ALP is markedly elevated in RA. The elevation in ALP might be explained by a compensatory bone regeneration mechanism and osteoblastic proliferation in an effort to restore the eroded bones in the joints⁵.
Low level of serum calcium in RA patients might be explained by the intermediate metabolism of vitamin D which may be abnormal in RA, although reports on cases with RA and osteomalacia have drawn attention to the coexistence of these two diseases\(^{14}\). Another study reported the increased level of ALP in RA indicates that the disease is more active, and ALP is a biochemical marker of bone turnover which provides a clinically useful evidence of the pathologic process that reflects bone cell activity on the skeleton\(^{11}\).

**Subjects and Method**

This study is a case-control study conducted at Baghdad Teaching Hospital in Medical City, Baghdad, Iraq, with a total of 100 patients of RA (96 females: 4 males) according to the 2010 American College of Rheumatology/European League Against Rheumatism classification criteria for Rheumatoid arthritis was included and compared with 50 healthy controls (46 female: 4 male) matched for age and sex.

**Exclusion criteria:**

- Overlap connective tissue diseases.
- Patients with vitamin D deficiency, thyroid and parathyroid diseases, malignant diseases, renal and hepato-biliary diseases, bone fractures and diabetes mellitus.
- Patient who wastaking (calcium and vitamin D supplements, bisphosphonates, diuretics and alcohol).
- Pregnant women or those in postpartum period.

The exclusion had been done by a full history, examination and investigations (serum vitamin D, Thyroid function test, Parathyroid hormone, liver function tests and renal function tests). Blood samples were taken from individuals in both groups under aseptic venepuncture and 5ml of blood were collected without tourniquet to test for Serum Calcium (S.Ca), with normal value \((8.4-10.4)\) mg/dl. Serum Alkaline Phosphatase (S.ALP), with normal value \((46-116)\) IU/L by Dimension EXL, immunoaassay analyser which was made in Germany. Serum albumin \((3.4-5)\) g/dl, Blood urea \((15-38)\) mg/dl, Serum creatinine \((0.5-1.3)\) mg/dl, Serum aspartate transaminase (AST) \((15-37)\) IU/L, Serum alanine transaminase (ALT) \((14-63)\) IU/L, erythrocyte sedimentation rate (ESR) \((0-20)\) mm/H, C-Reactive Protein (CRP), Rheumatoid Factor (RF). Disease activity was measured using Clinical Disease Activity Index (CDAI), and Disease Activity Score 28 (DAS 28).

**Statistical Analysis:** Data analysis carried out using SPSS version 23. Numbers and percentages had been used to represent the categorical data, while the mean and standard deviation were used to express the numerical data. Anova, independent student test, Pearson correlation and Chi-square tests (fisher exact test when not applicable) were used to confirm significance. Statistical significant considered whenever the P-value was less than \((0.05)\).

**Results**

The demographic characteristics of both groups are shown in **Table 1**. No statistically significant differences have been found between both groups in all variables. The laboratory and clinical characteristics of RA patients group are shown in **Table 2**. The rheumatoid factor was positive in \((87\%)\) of RA patients, CRP was positive in \((45\%)\) and negative in \((26\%)\), not measured in \((29\%)\) of patients group. Mean ±SD duration of disease was \((9(2.3)\) years. The activity of disease according to DAS28 showed that \(9\%, 46\%\) and \(45\%\) of patients presented with mild, moderate and high disease activity respectively while according to CDAI, the results showed that \(10\%, 56\%\) and \(34\%\) of patients had mild, moderate and high disease activity respectively. The treatment of RA patients was: Biologics \(64\%\), cDMARD \(89\%\), NSAID \(17\%\) and steroid \(47\%\). No statistically significant difference \((p\geq0.05)\) in mean values of serum calcium, corrected calcium, serum alkaline phosphatase and serum albumin levels has been found between RA patients and controls groups, as shown in **Table 3**. No statistically significant correlation between RA disease activity according to (CDAI and DAS28) with S.Ca, corrected Calcium or S.ALP level. The mean values of serum calcium, corrected calcium and serum alkaline phosphatase levels were slightly higher with moderate and high disease activity in comparison to low disease activity in RA patients group, but the difference did not reach the significant level \((p\geq0.05\) for all) **Table 4**. There is a weak non-significant indirect correlation between the CDAI value and serum alkaline phosphatase level \((R=0.01, P\geq0.9)\), in **Figure 1**. There is a weak non-significant direct correlation between the DAS-28 value and serum alkaline phosphatase level \((R=0.02, P\geq0.8)\) as illustrated in **Figure 2**.
Discussion

Few data were published about the assessment of serum calcium and serum alkaline phosphatase levels in RA and their correlation with disease activity. No statistically significant differences (p≥0.05) have been found between RA patients and healthy controls regarding mean values of (S.Ca, Corrected Ca, S.ALP) levels. This result differs from several studies, which revealed that (S.Ca) level decreases and (S.ALP) level elevates in RA patients as compared to healthy controls. This elevation in ALP was explained by a compensatory bone regeneration mechanism as an effort to restore the eroded bones in the joints. Circulating pro-inflammatory molecules & hormones that alter calcium metabolism contribute to the diminished calcium status(5). Other studies showed that the (S.ALP) level in RA patients significantly increased when compared to controls, in which bone formation increases with cytokines mediated increased resorption of bones, which correlates with increased ALP in RA patient serum(15).

The possible explanations for these differences from the current study might be related to: first; the difference in sample sizes, Second; alteration of protein levels can cause changes in the total calcium, without affecting the ionized calcium physiologically and clinically, thus, the total calcium adjustment to albumin is very important when trying to determine the value of normal calcium(9). Third; the decrease in (S.Ca) level and elevation in (S.ALP) level in RA patients might be related to vitamin D deficiency, most of these studies did not exclude patients with vitamin D deficiency in their samples. In the current study, patients with vitamin D deficiency in RA patients and controls group (about 25 RA patients and 3 healthy control have been excluded from study due to their vitamin D deficiency in those who reported with low S.Ca or high S.ALP levels or both). Serum vitamin D was positively correlated with serum calcium level that reported by Kiran et al(16). Raised serum alkaline phosphatase (ALP) is a sensitive marker which could be used as a screening test to detect vitamin D deficiency(17). No statistically significant correlation has been found between the disease activity(according to CDAI and DAS 28) and serum calcium, corrected calcium and alkaline phosphatase levels. Although the mean values of serum calcium, corrected calcium, and alkaline phosphatase were slightly higher in moderate and high disease activity indices( P ≥0.05). The current study demonstrated that there was no significant difference (P≥0.05) in mean values of (S.Ca, Corrected Ca and S.ALP) levels when compared according to the biomarkers disease activity (ESR level, CRP and RF positivity) in RA patients group.

Conclusion

No significant differences between rheumatoid arthritis patients and healthy controls in serum calcium and serum alkaline phosphatase levels have been found, as well as no significant correlation with disease activity indices.

Table 1. Demographic characteristics of RA patients and controls.

<table>
<thead>
<tr>
<th>Patients</th>
<th>Control</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number</strong></td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Age/year, Mean±SD</td>
<td>48±12</td>
<td>44±11</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>96</td>
</tr>
<tr>
<td>BMI kg/m², Mean±SD</td>
<td>28.9±4.9</td>
<td>29.9±5.8</td>
</tr>
<tr>
<td>Occupation</td>
<td>Employed</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Non-employed</td>
<td>84</td>
</tr>
<tr>
<td>Smoking</td>
<td>Non-smoker</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>Smoker</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Ex-smoker</td>
<td>0</td>
</tr>
</tbody>
</table>

RA, rheumatoid arthritis; BMI, body mass index; Kg, kilogram; M2, square meter; P-value, probability value; SD, standard deviation.
Table 2. Laboratory and clinical characteristics of RA patients group.

<table>
<thead>
<tr>
<th>Variable</th>
<th>RA patients</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>RF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>87</td>
<td>87.0</td>
</tr>
<tr>
<td>Negative</td>
<td>13</td>
<td>13.0</td>
</tr>
<tr>
<td>CRP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>45</td>
<td>45.0</td>
</tr>
<tr>
<td>Negative</td>
<td>26</td>
<td>26.0</td>
</tr>
<tr>
<td>Was not done</td>
<td>29</td>
<td>29.0</td>
</tr>
<tr>
<td>ESR mm/H</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>17</td>
<td>17.0</td>
</tr>
<tr>
<td>Increased</td>
<td>83</td>
<td>83.0</td>
</tr>
<tr>
<td>Disease duration/year, Mean±SD</td>
<td>9.0±2.3</td>
<td></td>
</tr>
<tr>
<td>DAS28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>9</td>
<td>9.0</td>
</tr>
<tr>
<td>Moderate</td>
<td>46</td>
<td>46.0</td>
</tr>
<tr>
<td>High</td>
<td>45</td>
<td>45.0</td>
</tr>
<tr>
<td>CDAI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>10</td>
<td>10.0</td>
</tr>
<tr>
<td>Moderate</td>
<td>56</td>
<td>56.0</td>
</tr>
<tr>
<td>High</td>
<td>34</td>
<td>34.0</td>
</tr>
<tr>
<td>Biologics</td>
<td></td>
<td>(%)</td>
</tr>
<tr>
<td>Etanarecept</td>
<td>50</td>
<td>50.0%</td>
</tr>
<tr>
<td>Rituximab</td>
<td>12</td>
<td>12.0%</td>
</tr>
<tr>
<td>Infliximab</td>
<td>2</td>
<td>2.0%</td>
</tr>
<tr>
<td>Total</td>
<td>64</td>
<td>64.0%</td>
</tr>
<tr>
<td>None</td>
<td>36</td>
<td>36%</td>
</tr>
<tr>
<td>DMARD No. (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTX</td>
<td>66</td>
<td>66.0%</td>
</tr>
<tr>
<td>HCQ</td>
<td>8</td>
<td>8.0%</td>
</tr>
<tr>
<td>Azathioprine</td>
<td>6</td>
<td>6.0%</td>
</tr>
<tr>
<td>Leflunomide</td>
<td>4</td>
<td>4.0%</td>
</tr>
<tr>
<td>MTX &amp; HCQ</td>
<td>5</td>
<td>5.0%</td>
</tr>
<tr>
<td>Total</td>
<td>89</td>
<td>89%</td>
</tr>
<tr>
<td>None</td>
<td>11</td>
<td>11%</td>
</tr>
<tr>
<td>NSAID No. (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meloxicam</td>
<td>9</td>
<td>9%</td>
</tr>
<tr>
<td>Diclofenac NA</td>
<td>5</td>
<td>5%</td>
</tr>
<tr>
<td>Naproxen</td>
<td>3</td>
<td>3%</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>17%</td>
</tr>
<tr>
<td>None</td>
<td>83</td>
<td>83%</td>
</tr>
<tr>
<td>Steroid (yes)</td>
<td>47</td>
<td>47%</td>
</tr>
</tbody>
</table>

RA, rheumatoid arthritis; NO, number; RF, rheumatoid factor; CRP, C - reactive protein; ESR, erythrocyte sedimentation rate; mm, millimeter; H, hour; DAS28, disease activity score 28; CDAI, clinical disease activity index; SD, standard deviation; DMARD, disease modifying anti rheumatic drugs; MTX, methotrexate; HCQ, hydroxychloroquine; NSAID, non-steroidal anti inflammatory drugs.
Table 3. Comparison of (S.Ca, Corrected Ca and S.ALP) levels between RA patients and controls.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patients</th>
<th>Controls</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean±SD</td>
<td>Mean±SD</td>
<td></td>
</tr>
<tr>
<td>S.Ca mg/dl</td>
<td>9.1±0.5</td>
<td>9.2±0.4</td>
<td>0.1</td>
</tr>
<tr>
<td>Corrected Ca mg/dl</td>
<td>9.9±1.3</td>
<td>9.4±0.6</td>
<td>0.4</td>
</tr>
<tr>
<td>S.ALP IU/L</td>
<td>87.5±27.5</td>
<td>84.3±24.1</td>
<td>0.4</td>
</tr>
<tr>
<td>S.albumin g/dl</td>
<td>3.5±1.1</td>
<td>3.6±1.4</td>
<td>0.5</td>
</tr>
</tbody>
</table>

S.Ca, serum calcium; S.ALP, serum alkaline phosphatase; S. albumin, serum albumin; RA, rheumatoid arthritis; P-value, probability value; SD, standard deviation; mg, milligram; g, gram; dl, deciliter; IU, international unit; L, liter.

Table 4. Correlation between (S.Ca, Corrected Ca, S.ALP) and disease activity in RA patients group.

<table>
<thead>
<tr>
<th>Disease activity scores</th>
<th>S.Ca mg/dl</th>
<th>Corrected Ca mg/dl</th>
<th>S.ALP IU/L</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean±SD</td>
<td>Mean±SD</td>
<td>Mean±SD</td>
</tr>
<tr>
<td>CDAI range</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (2.8-≤10)</td>
<td>8.89±0.4</td>
<td>9.31±0.5</td>
<td>83.40±32</td>
</tr>
<tr>
<td>Moderate (&gt;10-≤22)</td>
<td>9.10±0.5</td>
<td>9.45±0.6</td>
<td>86.91±28</td>
</tr>
<tr>
<td>High (&gt;22)</td>
<td>9.13±0.5</td>
<td>9.45±0.6</td>
<td>89.58±26</td>
</tr>
<tr>
<td>P-value</td>
<td>0.4</td>
<td>0.7</td>
<td>0.8</td>
</tr>
<tr>
<td>DAS Range</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (2.6-&lt;3.2)</td>
<td>9.13±0.6</td>
<td>9.46±0.6</td>
<td>82.33±35</td>
</tr>
<tr>
<td>Moderate (≥3.2≤5.1)</td>
<td>9.16±0.5</td>
<td>9.47±0.6</td>
<td>88.85±28</td>
</tr>
<tr>
<td>High (&gt;5.1)</td>
<td>9.18±0.6</td>
<td>9.48±0.6</td>
<td>87.08±26</td>
</tr>
<tr>
<td>P-value</td>
<td>0.8</td>
<td>0.7</td>
<td>0.8</td>
</tr>
</tbody>
</table>

S.Ca, serum calcium; S.ALP, serum alkaline phosphatase; CDAI, clinical disease activity index; DAS28, disease activity score 28; P-value, probability value; SD, standard deviation; mg, milligram; dl, deciliter; IU, international unit; L, liter.

Figure 1. Correlation of Serum Alkaline Phosphatase (ALP IU/L) with CDAI CDAI, clinical disease activity index; S.ALP, serum alkaline phosphatase.
Fig 2. Correlation of Serum Alkaline Phosphatase (S.ALP IU/L) with DAS28. DAS28, Disease Activity Score 28; S.ALP, serum alkaline phosphatase.

Limitations of the Study:
1. Data collection had been done in one single institute.
2. Small sample size.

Conflict of Interest: Nil.

Source of Funding: Self-funding.

Ethical Clearance: Consent was obtained from each participant included in this study according to the declaration of Helsinki. Ethical approval was obtained from the Ethics Committee in Medical Department, College of Medicine, Baghdad University.

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5. Poddar A, Behera DD, Ray S. Serum alkaline phosphatase activity & serum calcium levels: an


Effectiveness of Nursing Management Educational Program upon Head Nurses Knowledge Regarding Staff Management

Ali Hussein Ali Al-Jazaeri¹, Muna A. Khaleel²

¹PhD Student, University of Babylon-College of Nursing-Family and Community Health Nursing,
²Prof. Dr. Al-Bayan university-College of Nursing-Family and Community Health Nursing

Abstract

Background: Globally, the role of the unit nurse manager has evolved exponentially over the past several decades from that of clinical ward sister, overseeing mainly patient care on a single unit, to that of nurse manager with a much wider scope of practice. Unit operations including budget, recruitment and retention, staff development, quality and evidence-based practice for patient outcomes. Prior to that era, “ward charge nurses” were responsible for only clinical patient care on their single unit, and were expected to perform patient care (Bailey, 2014).

Objectives: Implement the nursing management education program for the study group.

Methodology: A quasi-experimental design is carried out throughout the present study with the application of test-retest approach for the study and control groups from March 24th 2019 to Feb 19th 2020.

Settings of the Study: This study was conducted at the nursing units of Al-Najaf AL-Ashraf City Hospitals which include (Al-Sadr Medical City, Al-Hakeem General Hospital and Al-Zahra Teaching Hospital, they represented AL-Najaf AL-Ashraf city).

Result: Showed that the study group participants had benefits from the implementation of nursing management education program.

Conclusions: The program considered an effective mean for the improvement of the head nurse’s knowledge.

Recommendations: Head nurses should have the required knowledge about wards management regarding staff management. And nursing management education program is an important tool for the development of head nurses’ skills. Accordingly, head nurses need to be encouraged to participate in nursing management education program focused on staff management. Finally, the study proved that there is an essential need for collaboration between the Ministry of Higher Education and Scientific Research with Ministry of Health and Environment to improve the nursing management courses as a part of curriculum in nursing institutes and universities.

Keyword: Effectiveness, Nursing, Management Educational Program, Head Nurses, knowledge, Staff Management.

Introduction

Management is ability of leading, planning, staffing, organizing, and controlling actions to reach objectives. Planning includes determine of objectives and finding method to achieve them. Staffing and organizing is the process of confirming that the important physical and human resources are obtainable to attain the objectives of planning. Organizing also includes identify job to the correct individual or team and identifying who has the manager to achieve responsibilities. Managing is effecting others staff to reach the organizations objectives and includes directing, energizing and persuading others staff to reach those objectives. Controlling is comparing real role to a standard and rereading the original strategy as required reaching the objectives.¹
Methodology

Design of the Study: A quasi-experimental design is carried out throughout the present study with the application of test-retest approach for the study and control groups from March 24th 2019 to Feb 19th 2020.

Settings of the Study: This study was conducted at the nursing units of Al-Najaf AL-Ashraf City Hospitals which include (Al-Sadr Medical City, Al-Hakeem General Hospital and Al-Zahra Teaching Hospital, they represented AL-Najaf AL-Ashraf city).

Results

Table (1) Pre to Post Training Changes in Mean Scores of Knowledge about Tasks of Staff Management

<table>
<thead>
<tr>
<th>Changes in Overall Mean Score</th>
<th>Study group (n = 30)</th>
<th>Control group (n = 30)</th>
<th>Effect size</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Pre-test</td>
<td>2.43</td>
<td>0.44</td>
<td>2.47</td>
<td>0.41</td>
</tr>
<tr>
<td>Posttest 1</td>
<td>2.85</td>
<td>0.23</td>
<td>2.45</td>
<td>0.39</td>
</tr>
<tr>
<td>Posttest 2</td>
<td>2.81</td>
<td>0.24</td>
<td>2.44</td>
<td>0.38</td>
</tr>
<tr>
<td>Mean difference Pre</td>
<td>0.42</td>
<td>0.15</td>
<td>-0.02</td>
<td>0.14</td>
</tr>
<tr>
<td>Mean difference Post</td>
<td>0.38</td>
<td>0.13</td>
<td>-0.03</td>
<td>0.16</td>
</tr>
<tr>
<td>Mean difference Post2-Post 1</td>
<td>-0.04</td>
<td>0.20</td>
<td>-0.01</td>
<td>0.19</td>
</tr>
</tbody>
</table>

Multiple comparison (pairwise) within groups

<table>
<thead>
<tr>
<th></th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post 1 vs. Pre</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Post 2 vs. Pre</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Post 2 vs. Post 1</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

As it shown in (Table 1), the comparisons of mean knowledge score of the head nurses in both groups at pretest, posttest 1 and posttest 2 revealed that the overall mean knowledge score in the study group changed from 2.43 before training to reach 2.85 after training (posttest 1) and maintained at 2.81 at posttest 2. The differences in pairwise multiple comparison were statistically significant, when compare Post 1-Pre (P<0.001), Post 2 vs. Pre (P<0.001) and post 2 vs. post 1 (P=0.001). Indicated that the overall mean knowledge score for this study at posttest 1 was significantly higher than that at pre training and at posttest 2, and that at posttest 2 was significantly higher than that at pre training. No such changes had been reported in control group and the differences in mean knowledge score were not significant at pre, post1 and post 2. From other point of view, the comparison between both groups at posttest 1 and posttest 2 revealed significantly higher change in study group than controls with a large effect size of 1.29 and 1.19, respectively, indicated that much of the change in the knowledge scores attributed to the training program. Larger effect size also reported when the mean difference are compared between the study and control groups. Moreover, the trends of changes in mean knowledge score in both groups are graphically compared in (Figure 1).

Discussion of the Results

Staff management is the method of receiving work done by head nurse through staff nurses. Nursing staff management is the process working through nursing personnel to provide care, cure, and comfort to groups of patient (Council & Nurses, 2018). There are potentials for head nurse supervision in wards to participate in the development of skilled workforce and nursing staff which can positively contribute to hospitals objectives.²

Table (1), indicates that the overall mean knowledge score for this study at posttest (1) was significantly higher than that at pre training and at posttest (2) and that of posttest (2) was significantly higher than that at pre training. No such changes had been reported in control group and the differences in mean knowledge score. The differences were not significant at pre, post (1) and post (2). On the other hand when both groups compared the effect size of training program was large.
(1.62), in the change of mean knowledge score for this domain at posttest (1), large (1.28) at post-test (2), and cumulatively much large effect size of (3.42) and (3.0) when the mean differences posttest (1) pretest and posttest (2) pretest taken into account, but small effect size of (0.33) reported at posttest (1) posttest (2) but it still significant in study group than controls. This means that head nurses acquired high improvement in nursing staff management knowledge by education program compared to their knowledge at pretest.

Misiukonis, (2011) reported that head nurse and staff nursing are motivated when training is used as a management philosophy to develop nursing staff performance. Similarly.\textsuperscript{3}

Saleh, (2015) mentioned that there was highly improvement for level of head nurses’ knowledge in all topics of clinical supervision after implementation of educational program compared with pretest.\textsuperscript{4}

This result consistent with Wiley (2016), in that he showed that after nursing management education program, head nurses gained better coping mechanisms and increased confidence resilience in improving staff nursing management and cohesion.\textsuperscript{5}

Conclusions:

Much improvement in the knowledge of study group was detected after implementation of teaching program (post-test1) regarding staff management; therefore, highly significant differences were reported between study group and controls in the proportions of correct responses towards the items of domain with a large effect size.

Recommendations:

1. Head nurses should have the required knowledge about wards management regarding staff management.

2. Nursing management education program is an important tool for the development of head nurses’ skills. Accordingly head nurses need to be encouraged to participate in nursing management education program focused on wards management.

3. The study recommends focusing on scientifically qualified nurses with minimum of BSc degree to work in the nursing wards.

4. The study proved that there is an essential need for collaboration between the Ministry of Higher Education and Scientific Research with Ministry of Health and Environment to improve the nursing management courses as a part of curriculum in nursing institutes and universities.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing, University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

References


Association of Explosive Power and Agility among Cricketers of State Level

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Abstract

Often cricket is stated as an aerobic sport however when broken down the game is played by the players performing at various speeds and intensities—jumping, sprinting, catching, diving, majority of the play is in intervals and the activity does not lasts for long periods of time (e.g.; batting, bowling, fielding, wicket keeping, making a run). Purpose of the study is to determine association between explosive power agility in state level cricket players. Previous studies have investigated physical performances with respect to injury incidence and prevention. In this study physical aspects such as power, agility and anaerobic fitness shall be considered. Also due to paucity of evidences and studies on this literature it is important to find an association between the explosive power, agility among cricket players of state level. Total 100 male state level cricketers from different cricket academies were included in the study. Subjects with age group of 16-23 were taken in the study. Screening and assessment protocol were followed to select participants. Performance tests were measured. Explosive power with vertical jump test, agility with run a 3 test. Result of study showed:

1. Correlation between explosive power and agility was -.305** and it was significant at .002.

Present study concluded that explosive power is negatively correlated with agility.

Keywords: Fast twitch muscle type, anaerobic capacity, fitness testing, professional cricket, performance.

Introduction

Cricket is a sport that is played by millions from all the corners of the globe. All over the world three formats are practised at the elite level: Test, One day, and Twenty-20.21 Cricket involves large physiological demands of the human body, muscular strength and endurance, CVS endurance, speed, agility, power, flexibility etc. Often cricket is stated as an aerobic sport however when broken down the game is competed by the athletes playing at a range of speeds and intensities—jumping, sprinting, catching, diving, greater part of the sport is in pauses and the movements does not lasts for long periods of time (e.g.; batting, bowling, fielding, wicket keeping, making a run).

Cricket involves sudden movements which are often slow and fast. A professional player is expected to perform a large number of sprints, jumps, lunges and rapid directional changes. As well as another characteristic of cricket is execution of sporadic or fast movements of moderate to high intensity relate to repetitive actions of short duration but greater intensity as it occurs in other sports with similar characteristics like (squash etc). The shorter game formats tend to be more physically intensive when related to match duration, incorporating more maximal sprints when fielding, bowling, and batting. As a result of these demands, running speed, agility and power or strength has become an essential athletic quality for cricketers and therefore must be assessed correctly. Appropriate speed & agility assessments can provide an indicator of an athlete’s level of ability, and be used to monitor physical development.

Leg strength and speed (power) are vital for cricketers. These two elements to influence the speed and agility necessarily meant for fielding, wicket keeping and
running between wickets. It is even essential for bowlers because it helps them monitor and practice their ability to absorb the forces experienced by the legs during a delivery.\textsuperscript{4} Strength of the muscles of lower extremity upper extremity and trunk is of utmost importance for the execution of strokes of the ground.\textsuperscript{32}

Cricket is termed as an interval sport with equally anaerobic and aerobic components.\textsuperscript{26} At advanced ability intensities, technical performance may be reduced by physical attributes, physical fitness and performance qualities.\textsuperscript{31} Also, cardiorespiratory fitness in terms of max O2 uptake (VO\textsubscript{2max}) reflects physical fitness of a person hence; VO\textsubscript{2} max is the single preeminent measure of cardiorespiratory capacity and is considered as a bench mark to quantity CVS functional capacity and aerobic fitness.

There are various study conducted to assess agility and explosive strength but there are lack of literature studying association between explosive power agility in cricket player

**Methodology**

Subjects were taken after signing informed consent including 100 male state level cricket players with age group of 16-23 with normal BMI (<25), who fulfilled the inclusion criteria playing for at least 1 year at state level. Players were asked to perform general warmup for 20 mins2 performance tests were measured. Explosive power using vertical jump test. Agility using run a 3 test. Data will be collected from academy in Faridabad and Delhi. Assessment form was filled (details pertaining to sport, dominance, level of playing position etc.)

The demographic details are recorded and information about subject is collected in assessment formheight (cms) and weight (kg) and BMI was calculated. After completing the assessment form the testing for vertical jump, run a 3 test was done after a general warmup. Height was measured using a wall mounted stadiometer with a horizontal head board. Players stood barefoot, feet together and stand tall. Height and weight was recorded to a precision of 0.1 cms and 0.1kg respectively.

Sargent chalk jump test: Subjects stood with one side against a wall, heels together and held a one inch piece of chalk in the hand nearest to the wall. With the heels together the subject was asked to make mark as high as possible on the wall. Then were required to jump as high as possible to make another mark on the wall, the score was calculated at the distance in centimetres between the reach mark and the highest jump mark attained by the subject.

Run a three test: To assess agility, “Run a three” protocol of Bourdon et al was chosen. The subjects were asked to warm up prior to the test and allowed at least two trials at sub maximal pace. The test was performed on a cricket wicket or crease of 17.68m or 22 yards respectively. Subjects were instructed to presume the starting position, with one foot behind the popping crease line and cricket bat in hand and with knee pads, physically and mentally ready to take run. No cue was given to begin the test. The timing began when the subject’s rare foot left the ground and finished as the bat crossed the popping crease line at the end of the third run. Subjects had to perform three trials with the fastest average time was recorded as the best score. A rest interval of ≥5 minutes was given between trials. The average time from the two stopwatches was recorded to the nearest 0.1 second.

The statistical tests were applied which includes mean, standard deviation, Karl Pearson correlation for assessing the correlation between agility and explosive strength, SPSS 21 version was used as a statistical tool. Relationship between the test variables were determined by using bivariate correlation.

In this study the level of significance was set as p ≤ 0.05.

**Results**

The descriptive values of the sample group are shown in the table below:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Males (N=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>17.49±1.68</td>
</tr>
<tr>
<td>BMI (kg/m\textsuperscript{2})</td>
<td>22.76±2.61</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical jump height (cms)</td>
<td>53.1±7.52</td>
</tr>
</tbody>
</table>

Descriptive statistics of Explosive power test.
Descriptive statistics of Agility test.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run a 3 test (sec)</td>
<td>10.6±.563</td>
</tr>
</tbody>
</table>

Correlation between explosive power (vertical jump height) and agility (Run a 3 test).

<table>
<thead>
<tr>
<th>Variables</th>
<th>r-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical jump height &amp; Run a 3 test score</td>
<td>-.305**</td>
<td>.002</td>
</tr>
</tbody>
</table>

Scatter gram of vertical jump height score and Run a 3 test score.

**Conclusion and Discussion**

Study was to assess the explosive power of the cricket players. According to the result of the present study mean scores of explosive power (cms) were 53.10. Similar studies Gabbet et al stated there was limited research pertaining to the enhancement of athletic performance although he stated that a study on professional rugby players had a better or significant impact of lower body explosive power and speed on their physical playing performance. On the contrary longitudinal studies on rugby players found no differences in explosive strength as a marker of physical performance.\(^\text{23}\) A study by Carr et al on elite cricketers measuring their explosive power over a range of season showed improvements in lower body power scores overall the seasons.\(^\text{5}\) Studies by Johnstone on explosive power differences in batsman and bowlers showed negligible differences among them. Jakovljev through his studies concluded “explosive power is an essential pre requisite for sports that demand explosiveness and fast maximal energy production and finds need to be incorporated for planning and training, performance prediction and talent identification in various sports”.\(^\text{19}\) Castagna has also further layed emphasis on the varying role of explosive power in various sports like cricket and basketball which is
essential for improving their performance. Secondly study was focused to assess agility of cricket players. According to results of the present study the mean scores of agility (secs) were 10.6. A study stated role and efficacy of agility in cricket is increased with implementation of a 6 week specific exercise programme. Similar study done by Shrivastava (2015) confirmed specialized exercises help in increase of cricket specific agility in male cricket players. Agility is the most crucial factor influencing movement also as important to influence motor action. Boora (2016) also emphasised agility has a distinctive role in cricket to execute competent footwork and rapid changes in body position. Various studies done to evaluate variable of physical fitness i.e. agility in batsmen and bowlers reviewed batsmen had better agility that had an influence on physical performance. According to a study on effect of different types cricket batting pads on running and turning speed showed no significant differences in running or turning speed due to the influence of different cricketing pads.

Third objective of study was to determine the association between explosive power and agility of cricket players. Results of the present study stated explosive power showed moderate negative correlation \((r=-.305^{**})\) and was highly significant at \((p=.002)\) with agility and the result states that with improved vertical jump height scores there is an eventual decrease in time required to complete 3 consecutive runs. A study done to assess role of explosive power of male footballers showed explosive power was the most dominating variable for improving agility. Numerous studies by other researchers have same results which supported this study. Conducted similar study measuring these variables on basketball players. Study stated that leg strength and power were most significant factors required by cricketers especially fielders such that it contributed to further increase in agility and speed required for fielding. Studies have supported that with specific 6-8 week exercise programme including plyometric, resistance and interval training has shown to improve the explosive power and impact the influence of agility desirable for athletic performance. Exercises have an effect on anaerobic pathway ATP-PCr system and neuromuscular adaptions that cause improved balance and body position that favours on improving explosive power and agility. Also due to explosive nature of the sport there is definite need to develop power for increasing run up speed and agility.

## Conclusion

While computing the correlation coefficient between Explosive power, Agility the present study concluded that explosive power is negatively correlated with agility i.e. with peak score of jump height there is decrease in time taken to complete 3 runs by the players which stated that good anaerobic power contributes in improving the agility performance necessary for the cricket players. Findings of the study can be used by physiotherapist, coaches as well as trainers or the sports professionals to train the team in relation to certain particular aspects that needed to be improved for the team to achieve better performance.

**Ethical clearance taken from:** Manav Rachna International Institute of Research and Studies committee.

**Source of Funding:** Self

**Conflict of Interest:** Nil

## References

1;12(1):50-5.
22. Lamani CG, Tiwari PS. A study of morphological of junior and senior cricket players and specific motor fitness of bowlers and batsman of Goa.
30. Potteiger JA, Smith DL, Maier ML, Foster TS. Relationship between body composition, leg

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Classification of Cancer Model for Clinically Actionable Genetic Mutations Using Machine Learning

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Abstract

Classification of Cancer Model Clinically Actionable Genetic Mutations Using Machine Learning Algorithms. Its task is to classify genes based on text evidence from clinical issues with good results. If a normal person has symptoms of cancer we can find it easily, but we have nine types of viruses in cancer in that which type of viruses has been attacked to the person cannot be easily predict by the doctors. So in hospitals there will be a clinical pathologist. Clinical pathologist has the data’s of cancer attacked before and he will collect the gene sample and the person blood sample and predict which type of virus of cancer will attack to the person.

Keywords: Genetic Mutations, Clinical Evidences, Clinical Pathologist, Natural Language Process.

Introduction

Cancer is one of the most dangerous diseases. If cancer attacked to a person and not treated properly, it may lead to death. Health wise cancer may lead to blood vomit, loss of hair falls, body weakness etc. Researchers who are researching about the cancer has said that if a cancer is attacked a person would be dangerous for his life, which may lead to death. If the cancer not only it will affect him but also affect his future generation through his genes attacks a person, a person attacked by cancer also led to interrupt the normal routine work.

Our objective is to solve to these types of problem, so in this way person and person concerned to the victim can be alerted before it’s late. To accomplish this, we need the data’s which clinical pathologist will have victim’s gene sample and blood samples to check which type of class(virus) of cancer will attack the person¹⁻².

This project is a real time project based on “TF-IDF, TF-IDF/BOW, XGB, Meta Bagging, Text Reduction, and SVD” techniques. It will predict which types of class (virus) of cancer will attack the person so that doctors and the person concerned can help him to recover from the cancer³⁻⁵.

Review of Literature: The machine-learning task is to addressing the crucial clinical method. In the previous research of cancer some other researchers have done for breast cancer and lung cancer by using some the machine learning algorithms like 5-fold cross validation and logistic regression etc. In our project what we have done is cancer classification with genetic mutations by using machine learning algorithms are Logical-Regression, K means ++, Naïve Bayesian, K-fold cross validation, X-boost, LDA Cosine Similarity, K Nearest Neighborhood⁶⁻¹². Naïve Bayesian is a supervised learning, in supervised learning input data’s should be well labeled it collects the data and predict the before results and make it better accuracy¹⁰. The theory applied here is to compare the genetic mutations with the collection data samples from the patients and predict the possibility of getting cancer².

The importance of using more algorithms than the previous research is to find better accuracy than the existing one. When we use algorithms one by one it will take much more time to complete the process so we use the method called hyper tuning which will take less amount of time to complete the process¹³⁻¹⁵.
**System Overview:** Classification of Cancer Model for Clinically Actionable Genetic Mutations is done for the theranostics. The architecture is described as shown in Fig 1. The program of this projected system are:

1. Included Sample Data (ISD)
2. Experimental Data Analytics (EDA)
3. Data Pre-processing:
   - Text Reduction
   - Dimension Compression
   - Component Extractions
4. Component Extraction against classified data
5. Genetic mutation classes 1-9 for classification of cancer
6. Result

![Fig. 1. Architecture of Described Technique](image)

After analyzing the data, the clinical evidences must be extracted for the components\[^1\]. The Neuro Linguistic Programming method are used here. The text data is represented using VSM. The features is being represented via formula given below:

\[ t_i = w_a, w_b, \ldots, w_n \]  
\[ W_j = tf_j \times idf_j \]  
\[ Idf_j = \log \]  
\[ \frac{X}{H} = P(X)/P(H) \]

Let \( n \) consist of total amount of unique contents in the text variant data, and \( w_j \) is the weight of the \( -n^{th} \) term in \( w_j \). The recurrence of the term is given by \( tf_j \), and the transposed document recurrence is given by \( idf_j \). The \( N \) is the total amount of documents in the training variant data set, and \( r_j \) is the amount of documents that contains the term \( j \) (text_variant). These extracted components are used for future operations.

The components are extracted using one hot encoding technique from genes and variation\[^2\]. For test train the sample input data we are using the naïve Bayesian classification. The above naïve Bayesian formula consist the predictor and hypothesis\[^9\].

The logical regression technique is used to validate the accurateness and logarithmic loss.

**Included Sample Data:** The datasets has been taken from kaggle. There 9 different type of categories of classified for the genetic mutations. The datasets square measure provided via 3 totally different files - coaching and take a look at. One (training_variants) provides training process for the data, (test_variants) provides the sample data testing and (training_text) will train the text formatted clinical evidences.
Experimental Data Analytics (EDA): Experimental Data Analytics (EDA) approach is employed for knowledge analytics. It used to analyse the experimental data of the classification method.

Data Pre-processing: The data pre-processing is used to check the input analysis data and gives result. The options of clinical text are extracted using TF-IDF technique. The options of genes and their variations are extracted using one hot cryptography technique.

Component extraction against classified Data: It is constructed for extracting the numerous classification algorithms already mentioned above. The options are being validated in form of logarithmic loss and accurateness.

<table>
<thead>
<tr>
<th>Gene</th>
<th>Variation</th>
<th>Class</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAMS8A</td>
<td>Truncating Mutations</td>
<td>1</td>
<td>Cyclin-dependent kinases (CDKs) regulate a var...</td>
</tr>
<tr>
<td>CBL</td>
<td>W802*</td>
<td>2</td>
<td>Abstract Background Non-small cell lung canc...</td>
</tr>
<tr>
<td>CBL</td>
<td>Q249E</td>
<td>2</td>
<td>Abstract Background Non-small cell lung canc...</td>
</tr>
<tr>
<td>CBL</td>
<td>N454D</td>
<td>3</td>
<td>Recent evidence has demonstrated that acquired...</td>
</tr>
<tr>
<td>CBL</td>
<td>L399V</td>
<td>4</td>
<td>Oncogenic mutations in the monomeric Casitas B...</td>
</tr>
</tbody>
</table>

Fig. 2. Joined Train text data and training variants data

Fig. 2 shows the joined data that is training text, training variants and text_variants data is joined based on data analytics.

<table>
<thead>
<tr>
<th>ID</th>
<th>Gene</th>
<th>Variation</th>
<th>Class</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>3321</td>
<td>NaN</td>
<td>NaN</td>
<td>NaN</td>
<td>The PTEN (phosphatase and tensin homolog) phos...</td>
</tr>
<tr>
<td>1921</td>
<td>NaN</td>
<td>NaN</td>
<td>NaN</td>
<td>3</td>
</tr>
<tr>
<td>53</td>
<td>NaN</td>
<td>NaN</td>
<td>NaN</td>
<td>4.365854</td>
</tr>
<tr>
<td>NaN</td>
<td>NaN</td>
<td>NaN</td>
<td>NaN</td>
<td>2.309781</td>
</tr>
<tr>
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<td>NaN</td>
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<td>1.000000</td>
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</tr>
<tr>
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<td>NaN</td>
<td>4.000000</td>
</tr>
<tr>
<td>NaN</td>
<td>NaN</td>
<td>NaN</td>
<td>NaN</td>
<td>7.000000</td>
</tr>
<tr>
<td>NaN</td>
<td>NaN</td>
<td>NaN</td>
<td>NaN</td>
<td>9.000000</td>
</tr>
</tbody>
</table>

Fig. 3. Exploratory stats on training data

Result

The result shows that the naïve Bayesian and logistic regression gives the better result analysis than the other algorithms.

System Analysis: For implementing, using EDA the dataset is first analyzed. For the good results and relationship between the different features the experimental data analytics is performed. The solution of the Experimental Data Analytics are helpful in Data pre-processing. The TD-IDF is the technique show the output of the experimental data analytics is given below:
Fig. 3 Shows Exploratory stats on the data such as par, structure of sample dataset, four quarters, Count, Highest, lowest values and standardized deviation. This info is necessary for experimental data analytics (EDA).

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Component Extraction</th>
<th>Algorithm Classifier</th>
<th>Accurateness</th>
<th>Logarithmic Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TF-IDF</td>
<td>Logical Regression</td>
<td>86%</td>
<td>0.6812</td>
</tr>
<tr>
<td>2</td>
<td>TF-IDF/BOW</td>
<td>K Means++</td>
<td>83%</td>
<td>0.7288</td>
</tr>
<tr>
<td>3</td>
<td>XGB</td>
<td>Naïve Bayesian</td>
<td>77%</td>
<td>0.8757</td>
</tr>
<tr>
<td>4</td>
<td>XGB</td>
<td>K-Fold Cross Validation</td>
<td>85%</td>
<td>0.6438</td>
</tr>
<tr>
<td>5</td>
<td>Meta Bagging</td>
<td>X-Boost</td>
<td>64%</td>
<td>2.0852</td>
</tr>
<tr>
<td>6</td>
<td>Text Reduction</td>
<td>LDA Cosine Similarity</td>
<td>69%</td>
<td>1.0731</td>
</tr>
<tr>
<td>7</td>
<td>SVD</td>
<td>K Nearest Neighbourhood</td>
<td>62%</td>
<td>2.0395</td>
</tr>
</tbody>
</table>

**Conclusion**

Here by we have done our project classification of cancer model for clinically actionable genetic mutations with prior seven machine learning algorithms (Logical Regression, K Means++, Naïve Bayesian, K-Fold Cross Validation, X-boost, LDA Cosine Similarity, K Nearest Neighbourhood). Here we are using the meta bagging method to separate the data sample and ID-TDF showing the better result analysis. The result shows 86% accuracy. Further experimentation can be applied to increase the accuracy.

**Ethical Clearance:** No Clearance Required

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**


COVID-19: The Invisible Massacre of the Elderly and the Possible Professional Liabilities

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Abstract

The elderlies are probably the most affected by the COVID-19 Pandemic. Despite this, the measures aimed at preventing the serious consequences that this health emergency may have on the elderly are still inadequate. This study analyses the effects of the current pandemic on elderlies and debilitated patients. In addition, the study focuses on the legal implications of the damages that the elderlies are suffering in this worldwide emergency.

Keywords: COVID-19; Sars-CoV-2; Health Policy; Elderly; Medical Liability; Ethics in Policy; Legal Medicine.

Introduction

COVID-19 Pandemic has created serious health, social and economic damage worldwide. Deaths due to COVID-19 continue to increase with serious repercussions. National Health Systems are implementing preventive and curative strategies aimed at containing infections and related deaths.

In this context of emergency is developing silently, especially in Europe, a serious emergency in the emergency: the massacre of the elderly in elderly homes. The numbers are worrying and there are still no appropriate strategies and solutions to contain the problem. The problem is so serious and urgent that the WHO regional director for Europe, Hans Kluge, called the Situation “deeply concerning”. This statement is based on dramatic data, in fact as of April 13, more than 55% of deaths in Ireland were linked to long-term care facilities. In France, as of April 15, more than 49% of deaths were linked to care facilities, while in Belgium more than 49% of the 4,857 deaths linked to Covid-19 as of April 16 were in care homes. Care England, Britain’s largest representative body for care homes, said that estimates based on some of the death rates since April 1 suggested up to 7,500 people in British care homes may have died of the virus, five times the official estimate. Moreover, Covid-19 related deaths in care homes in Portugal and Spain were 33% and 53% respectively.

Therefore, in many European Countries, half of the deaths for COVID-19 are elderly residents in the care homes.

Also, in Italy, where 35% of the population is over 65, there is a serious emergency related to COVID-19 related deaths in Elderly homes. The worrying number of deaths in health care facilities for the elderly has led the Italian Higher Institute of Health to carefully monitor the situation. From the careful analysis of the available data (however provisional) it has emerged that the number of deaths in Elderly homes is increasing exponentially in a worrying way, especially in 3 Italian regions (Lombardy, Piedmont and Emilia Romagna).

Legal Implications: The dramatic data of infections and deaths related to COVID-19 in care homes are even more worrying if analyzed in relation to the possible causes involved. In fact, there is growing concern around the world that these deaths were somehow predictable and preventable.
With regard to predictability, it is considered that long before the pandemic declaration it was already clear that the severe form of COVID-19 developed more easily in the elderly and that deaths were age-related. This has been confirmed by subsequent studies which have shown a higher mortality rate in older people. So, it was absolutely predictable that this pandemic would hit the elderly and debilitated more severely.

With regard to the avoidability of the numerous deaths in the elderly homes, it is important to stress that in recent weeks there have been numerous concerns in the health management of care homes. In fact, reports from health workers and relatives of victims are increasing exponentially. The criticism concerns the approach, considered ineffective and deontologically incorrect, in the field of prevention and monitoring of COVID-19 among the elderly. The problems concern the non-use of personal protective equipments (which often would not even have been provided to operators), the insufficient monitoring of body temperature and symptoms typical of COVID-19 (resulting in inadequate epidemiological and statistical classification of infections) and, even erroneous death certificates.

In this context, full of doubts still not clarified on the civil and criminal responsibilities of some elderly homes, in some states, as in Italy, we think about the possibility of creating a legal immunity for health professionals engaged in the battle against the COVID-19.

The purpose of a possible legal shield would be to protect doctors and all health professionals who could be targeted by legal proceedings for professional liability (related to the emergency COVID-19). In fact, the risk of a possible legal immunity is that the possible responsibilities of the health directorates of hospitals and homes are not properly investigated and eventually sanctioned. In fact, there are situations in which there have been questionable choices of elderly homes and care homes in the management of elderly and debilitated patients, as stated by the President of the National Medicine Board.

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Conclusions

It can be said that the problem of the protection of the elderly in care homes has been greatly underestimated in many Countries. The consequences of the spread of COVID-19 among weak and elderly people were, at least in part, predictable and avoidable. The responsibility of society as a whole can be seen in the poor and superficial management of vulnerable people. Unfortunately, this pandemic has shown us that the care, energy and resources we devote to the elderly are inadequate and inappropriate. It will probably be necessary to reform the entire organization of the elderly homes, often understood exclusively as a place where “abandon” individuals no longer “useful” and difficult to manage. It is hoped that the current concept of elderly homes will evolve to co-housing (managed by health professionals). As for psychiatric patients, even for elderly people who are not self-sufficient it is necessary to overcome the logic of institutionalization to implement the logic of “social healthcare”. All this must be aimed at not abandoning the vulnerable, but at ensuring all the necessary protection.

It is precisely in situations such as this - in which appropriate health policies become necessary - that society can demonstrate humanity, efficiency and effectiveness, or incivility and anti-ethical utilitarianism.

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Phytosanitary Examination: 
Ukraine Experience and International Standards

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Abstract

The article explores Ukraine’s experience in conducting phytosanitary expertise based on international standards. It was stated that Ukraine should develop a series of draft in national legislation in the field of quarantine and plant protection, which would be adapted to the legislation of the European Union and at the same time meet the requirements of the International Plant Protection Convention. It has been emphasised that Law of Ukraine No 2501-VIII “On Amendments to Certain Legislative Acts of Ukraine on Regulation of Some Phytosanitary Procedures” came into force on February 2, 2019. It has been concluded that Ukraine is currently actively applying international standards, participating in their development and registering official translations of international standards for phytosanitary measures. This creates a positive image of Ukraine as a reliable trading partner that does not violate the requirements of other countries and guarantees the conformity of product quality, phytosanitary procedures to internationally recognised standards. Therefore, for qualified phytosanitary examinations, the mechanism of guaranteeing compliance with national and international standards, amending legislation, introducing effective penalties for violation of the rules and procedure for conducting phytosanitary examinations should be a promising area.

Keywords: World Trade Organisation, phytosanitary control, international organisations, phytosanitary sector.

Introduction

Membership of Ukraine in international organisations, in particular in the World Trade Organisation (hereinafter – the WTO), the International Convention for the Protection of Plants (hereinafter – the IPPC), the Food and Agriculture Organisation of the United Nations (hereinafter – the FAO), provides for mandatory observance of the basic principles and requirements in the field of quarantine and plant protection at the international level. In view of this, the State Consumer Service of Ukraine is actively working on the harmonisation and adaptation of national phytosanitary legislation to international norms and standards. Accordingly, the requirements for the level of work of the National Organisation for Quarantine and Plant Protection are increasing. Ukraine needs to develop a series of draft national legislation in the field of quarantine and plant protection, which would be adapted to European Union legislation and at the same time meet the requirements of the International Plant Protection Convention.

It is worth noting that Ukraine has partially implemented some structural reforms in the phytosanitary sector, but these processes require constant state support and stimulation, international coordination, which will contribute to the development of agriculture in general. Such coordination can be undertaken primarily in the framework of international universal organisations within the UN system, in particular within the FAO. Thus, the revised International Standards on Phytosanitary Measures (ISPM) were adopted at the 13th session of the Commission on Phytosanitary Measures (2018): ISPM No 5 – Glossary of Phytosanitary Terms; ISPM No 6 – Supervision; ISPM No 15 – Wood Packaging Regulation in International Trade (Appendix 1 – Approved Wood Packaging Approaches (2018) and Appendix 2 – Sign (Marking) and its Use (2018)); ISPM No 42 – Requirements for the use of temperature treatments as
Ukraine has also participated in the discussion and adoption of these standards. These standards are actively used by both quarantine and plant protection professionals and manufacturers to ensure that their products comply with international phytosanitary legislation. In addition, on February 2, 2019, Law of Ukraine No 2501-VIII “On Amendments to Certain Legislative Acts of Ukraine Regulating the Implementation of Some Phytosanitary Procedures” came into force. Among the innovations are the granting of the right to carry out expert examination to private laboratories, new terms in the field of plant quarantine and the creation of the Register of Phytosanitary Certificates issued. According to the Law, private laboratory specialists were granted the right to carry out plant phytosanitary examination. However, only exporters can use these services. The owner of the cargo can choose in which laboratory to carry out an analysis—public or private.

In order to use the services of a private laboratory, the exporter must inform the regional representatives of the State Consumer Service of Ukraine about: transport, cargo, date and time of the beginning of the analysis by specialists of a private laboratory. The fact is that a private laboratory can carry out the analysis on its own, but the state representative must monitor the sampling and inspection of a cargo. Then the samples are packed in safe packages, the state phytosanitary inspector signs the act on the sampling, so the products are sent for examination. Phytosanitary examination report is valid for 14 days.

Many scientists and researchers study the methodology and technical features of expertise procedure, in particular, V.A. Makarov, V.P. Frolov, M.F. Shuklin, A.O. Kunakov, I.G. Seryogin, G.A. Talapov and others. Special attention should be paid to the scientific developments of V.I. Khomenko, V.I. Shablii, N.K. Oksamitny, G.N. Kruglyakov, who have improved the method and method of performing examinations. V.V. Vlasenko, R.Y. Kravtsov, V.I. Khomenko and others in their studies considered the procedure of documentation preparation and discussed the effectiveness of expertise procedures. I.V. Gushchuk, E.G. Slautenko study the issues of water and air pollution, which directly affects the efficiency of crops. At the same time, the issues of substantiation and modern peculiarities of exactly phytosanitary examinations procedure deserve due attention.

The aim of the article is to consider and analyse the necessity of designation and peculiarities of carrying out phytosanitary examinations in modern conditions in Ukraine on the basis of international experience and international standards.

Analysis of Organisations Dealing with Phytosanitary Expertise: Standardisation covers most areas of human activity. The WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) places particular emphasis on the role of international standards in establishing a multilateral system of rules and requirements governing the development, adoption and application of sanitary and phytosanitary measures to minimise their environmental impact. Thus, Article 3 of the SPS Agreement refers to international standards:

- In order to harmonise sanitary and phytosanitary measures on a broader basis, members should base their sanitary and phytosanitary measures on international standards, recommendations, if any, unless otherwise provided in this Agreement, and in particular in paragraph 3;
- Sanitary or phytosanitary measures that are consistent with international standards, recommendations, are necessary for the protection of life or health of humans, animals or plants and do not contravene the relevant provisions of this Agreement and GATT 1994.

Of particular importance is paragraph 2 of Art. 3 of SPS agreements. Taking into account the text of the preamble, the Agreement contains a direct reference to the standards developed by these organisations. The SPS Agreement establishes the rights of members to take the sanitary and phytosanitary measures necessary to protect the life or health of humans, animals or plants, which may be different from the standards set out in the Codex Alimentarius. However, such a presumption is established: measures based on international standards meet the requirements of the WTO provisions, which may serve as a basis for protection in the event of a dispute. This de facto speaks of the special status of the Codex Alimentarius Commission standards.

The Regional Plant Protection and Quarantine Organisation (RPPQO) is an intergovernmental organisation that acts as the Coordinating Body of national quarantine and plant protection organisations at the regional level. There are now ten RPPQOs, but...
the development of regional standards is carried out by the following organisations: the European and Mediterranean Organisation for Quarantine and Plant Protection, whose standards cover phytosanitary regulations and plant protection products against pests; The North American Quarantine and Plant Protection Organisation, standards designed to protect agricultural, forestry and other plant resources; The South Cone Regional Phytosanitary Committee (COSAVE), which regulates plant protection issues of particular interest to Member States.

Some issues of standardisation in the field of plant quarantine are also addressed by the International Organisation for Standardisation (ISO), created in 1946 by 25 national standardisation organisations. Its purpose is to promote the development of standardisation worldwide to facilitate international trade and mutual assistance, as well as to enhance cooperation in the fields of intellectual, scientific, technical and economic activities. Ukraine has been a full member of ISO since 1993. Member of the Committees: CASCO, STACO, INFCO. A national committee member of the DEVCO, REMCO, COPOLCO. 25 TCs of the State Standard of Ukraine cooperate with 96 TCs and ISO PCs. Ukraine is actively involved in the work of the joint TC ISO/IEC STK1 “Information Technology”, which was established in 1987.

Features of Phytosanitary Examination in Ukraine: Ukraine actively applies international standards, participates in their development and registers official translations of international standards on phytosanitary measures. In addition, in recent years, information systems (technologies) in many countries have become increasingly widespread in agriculture that help producers manage technological processes competently, with the least risk. They are used in all fields of agricultural production, including in the field of plant protection.

Phytosanitary, agroecological and economic diversity forces a large amount of information to be analysed when making decisions. In this case, it is no longer enough to only the monitor biological objects – their diagnosis and assessment of the intensity of development. In the conditions of multifactoriality of the analysed processes and multivariate decisions, not only phytosanitary diagnostics of diseased plants, but also their phytosanitary expertise is required. According to Art. 13 of the Law of Ukraine “On Plant Quarantine”, phytosanitary examination of regulated objects is carried out in order to find and/or identify regulated pests.

Phytosanitary examination is a system of phytosanitary, agroecological and agrometeorological observations and analysis, which allows to evaluate the current phytosanitary situation and to predict its development, including crop losses. Phytosanitary examination is provided by the central executive body, which implements the state policy in the field of plant quarantine, in accordance with international standards, instructions and recommendations. According to L. Baidakova, phytosanitary examination is an integral part of the state system of phytosanitary control in Ukraine. It is a set of measures aimed at protecting the territory and health of the population of Ukraine from the penetration from abroad of quarantine facilities, which can cause significant damage to the national economy of Ukraine.

The important principle of external plant quarantine is the prevention of the importation of quarantine pests to Ukraine. Many years of practice show that during phytosanitary control at border crossing points harmful organisms that are not present in the territory of our country are often found. Thus, during the period from 17.08.2019 to 12.09.2019, in the process of monitoring and inventory of old quarantine organisms, state phytosanitary inspectors found limited quarantine organisms in Ukraine, in particular:

- American white moth: in the Kirovograd region (in one area) on an area of 7 hectares; in the Odessa region (in six districts) on an area of 76.45 ha; in the Ternopil region (in one district) on an area of 0.2 ha; in the Kharkiv region (in four districts) on an area of 1.99 ha.
- Western corn rootworm: in the Volyn region (in six districts) on an area of 283.94 ha; in the Transcarpathian region (Beregovo and Chop) on an area of 15 hectares; in the Ivano-Frankivsk region (in one district) on an area of 215.25 ha; in the Odessa region (in four districts) on an area of 329 hectares.
- Potato scab: in the Ivano-Frankivsk region (in two districts) on an area of 21.945 ha; in the Lviv region (in one district) on an area of 16.64 ha.
- Cuscuta campestris: in the Kirovograd region (in three districts) on an area of 0.211 ha; in the Odessa region (in one district) on the area of 3.54 ha; in the Kharkiv region (in nine districts) on an area of 5.541 hectares.
hectares; in the Kherson region (in one district) on an area of 46 hectares.

• Russian knapweed: in the Kherson region (in one area) on an area of 2.5 ha.

• Cenchrus: in the Kherson region (in one area) on an area of 2 ha.\(^6\)

The results of the examination of each sample, carried out depending on the complexity of the analysis by laboratory specialists or inspectors, determine the phytosanitary status of the entire consignment and recommend certain phytosanitary measures.\(^7\) Phytosanitary examination is carried out directly by phytosanitary laboratories, which are located in every region of Ukraine. Functional flowchart of phytosanitary examination covers four main stages: I – diagnostics of dangerous harmful objects; II – phytosanitary monitoring; III – examination of phytosanitary risks; IV – decisions making about plant protection.\(^8\)

National plant protection organisations, carrying out phytosanitary risk analysis (hereinafter referred to as PRAs), should rely on biological and other scientific and economic data in accordance with relevant ISPMs.\(^9\) When performing PRAs, it is also necessary to consider the threats to biological diversity that result from the impact on plants. It is the latest advances in science, technic and technological advances in electronics and information technology that allow to quickly receive and analyse any amount of necessary information. Express method of diagnostics of harmful microorganisms, field microcomputers, automatic weather stations, satellite navigation systems, electronic data warehouses, operational satellite weather maps, geo-information phyto-landscape maps, etc. are now widely available.

Today, many countries have developed and are using a variety of decision support systems to manage the protection of agricultural crops, including cereals, from harmful organisms. A DESSAC system has been set up in England to support decision-making to protect crops from disease. The system is installed on the user’s computer. At program start-up, system users automatically receive meteorological information from nearby meteorological stations, enter agroecological data, the degree of disease development and spread, and the cost of the fungicide.\(^10\) In the Netherlands, Dacom company has developed PLANT-Plus. The model used by the system takes into account information on plant status, disease development, preliminary and prognostic weather conditions. It advises when and how to treat fungicides.\(^11\) In the United States, MoreCrop system operates to manage protection of wheat and barley against disease in the Northwest Pacific. It is designed for thirty plant diseases that are spread throughout the United States and in individual regions. In total, 11 factors are analysed.\(^12\) In Denmark, the Landbrugsinfo system has been developed and maintained to help farmers make operational decisions to grow field crops, considering agro-meteorological and phytosanitary situations.\(^13\)

For Ukraine, the use of decision support systems for the protection of, for example, cereals based on phytosanitary expertise is particularly significant. Phytosanitary security of any state means the protection of its territory from the risks that arise in the event of the penetration, spread and mass reproduction of pests, diseases of plants and weeds. The latter poses a real danger and can cause significant economic losses in a very short time. It is known that, as a result of pest activity, national agricultural producers lose more than 30% of their gross harvest annually.\(^14\)

**Conclusions**

Developing national and applying international standards, as a key factor in creating a quality system in the field of plant quarantine, not only ensure full fulfilment by Ukraine of its obligations under the IPPC and SPS, agreeing on the phytosanitary safety of exported quarantine cargoes, but also increase the competitiveness of the domestic vegetal products in the world market. This creates a positive image of Ukraine as a reliable trading partner that does not violate the requirements of other countries and guarantees the conformity of product quality, phytosanitary procedures to internationally recognised standards. Therefore, for qualified phytosanitary examinations, the mechanism of guaranteeing compliance with national and international standards, amending legislation, introducing effective penalties for violation of the rules and procedure for conducting phytosanitary examinations should be a promising area.

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Covid 19 Pandemic-
A Bane to Seeking Information in India

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Abstract

Right to seek information is a right deeply embedded into Article 19 of the Indian Constitution and which generally cannot be suspended in the worst of the worst situations save exceptions. The right guarantees Indian citizens to seek information from the public authorities on the touchstone of informed citizenry, greater and transparent access to information, accountability, and optimum use of limited fiscal resources. The recent impact of COVID-19 has not only shaken the basic edifice in India but has also weakened the countries across the world in some or the other mode. In a way the pandemic has caused immense trench in the economic as well as social well-being of the citizens.

The Right to Information Act, 2005¹ was enacted by the Parliament in India with the aim to provide for setting out the practical regime of right to information for citizens to secure access to information under the control of Public Authorities. The basic objective of the Right to Information Act is to empower the citizens, promote transparency and accountability in the working of the Public Authorities, contain corruption, and make our democracy work for the people in real sense.

Therefore an attempt in this paper has been made to ascertain, whether the rights of citizen to seek information in this great despondency time of Covid-19 has been able to bolster or not. Weather the right to information as guaranteed by the Indian Constitution is available to citizen irrespective of the pandemic situation.

Keywords: Right to information, Legal knowledge, Covid-19 crisis, unavailability of information due to lockdown.

Introduction

The origin of the Right to Information Act, 2005 in India is dated back to the Mazdoor Kisan Shakti Sanghatan (MKSS) which was an organization developed for the purpose of empowering the workers and landless farmers and other rural poor in 1987. At that time nobody could ever thing of raising a legit brow before the government for their actions and inactions but this organization began its work regarding seeking information in the State of Rajasthan during the early 1990s by organizing grassroots movement by demanding access to government information with respect to wage workers and other small farmers who were not given their rightful wages or were devoid of obtaining other benefits under the different government schemes. MKSS introduced the innovative concept of jansunvai or public hearing through which the organization started demanding for more information from the local government authorities with respect to their wages, attendance rolls as well as the material used for road construction during the relief work done during famine². Political activists in India got a lot of inspiration from this small beginning in the village of Rajasthan and similarly started demanding information from the bureaucracy and the government. The struggle of the activists spread this fire across the country and increased the demand of the public to guarantee the right of information to every citizen. This movement received support from other social activists, professionals, and other media who support transparent and accountable governance and empowering people³.
The sense of gaining information and thereafter utilizing the information to ascertain the good and the bad use of it by government created pressure and demand to codify law related to seeking information and thus the same resulted in enactment of various legislations viz. The Freedom of Information Act, 2002 and thereafter the Right to Information Act, 2005. The judicial verdicts have time and again balanced as to what information is to be provided and what is to be no provided. Moreover the courts in India has been enthusiastic in coming to aid of people who seek information and are denied the same under the veil of exemption provisions in the RTI Act, 2005 by imposing cost and invoking penal provisions. Moreover the recent Right to information Act has been designed to provide information to applicant within 48 hours of application in case the information sought relates to life and liberty of any person.  

Covid-19 in India and Seeking of Information:

COVID-19 is the infectious disease caused by the most recently discovered corona virus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019. The first case of the COVID-19 pandemic in India was reported on 30 January 2020. Since the first case of Covid-19 is reported in India, the government of India has taken steep steps to ensure that rapid expansion of this pandemic is not caused and has declared complete lock down in the nation, following which only the essential services were allowed to be undertaken and all the shops, malls, cinemas, public amusement parks, stadiums etc. were closed for public access.

According to the Right to Information Act, the appeals and complaints against public authorities of the Central government and Union Territories, Supreme Court and High Courts besides Public Sector Undertakings and autonomous Institutions set by Centre are heard by the Central Information Commission while those of State are heard by respective State Information Commissions.

Sadly, as per a study out of 29 Information Commissions in our country, 21 state panels did not hold any hearings to adjudicate complaints and appeals of RTI applicants during lockdown. The study said 21 commissions did not hold hearings. Only seven commissions, made provision for taking up urgent matters or those related to life and liberty during the period when normal functioning was affected due to the lockdown. These were the Central Information Commission and the state information commissions of Arunachal Pradesh, Haryana, Manipur, Punjab and Telangana. The State Information Commission of Rajasthan made provision for hearing such matters, though only from May 4, 2020.

The commissions also known as transparency watchdogs mandated to enforce proactive disclosure of information from government were found wanting on their website, according to the study, with websites of 11 commissions did not showing any information about the functioning of the Information Commission during lockdown.

The functioning of the state information commission is almost like the Central Information Commission.

When an RTI applicant is not satisfied with the response of the officer handling his query or with the appeal within the department against the decision, a second appeal is filed before the Information Commission, independent bodies to adjudicate the matter.

Eleven Commissions referred in the study are Assam, Bihar, Himachal Pradesh, Kerala, Madhya Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. The study also found that Jharkhand and Tripura did not have any commissioners for varying lengths of time and were completely defunct as the serving information commissioner in both retired during the period of the lock down. Four State Information Commissions were functioning without a Chief Information Commissioner - Bihar, Goa, Rajasthan and Uttar Pradesh.

COVID-19 and Judicial Intervention

- Constitution of High-Powered Committee in each state/union territory for release of prisoners on parole or interim bail (dated March 23, 2020)

In Suo Motu Writ Petition (C) No. 1/2020, In Re: Contagion of COVID-19 Virus in Prisons, a Bench of Chief Justice SA Bobde, and Justices L Nageswara Rao and Surya Kant directed that prisons must ensure maximum possible distancing among the prisoners, including undertrials.
The Bench also directed that the physical presence of all the undertrial prisoners before the courts must be stopped forthwith and recourse to video conferencing must be taken for all purposes. The transfer of prisoners from one prison to another for routine reasons was also prohibited, except for purpose of decongestion.

The Bench further directed that each State/Union Territory shall constitute a High Powered Committee comprising:

(i) Chairman of the State Legal Services Committee,
(ii) The Principal Secretary (Home/Prison)
(ii) Director General of Prison(s)

This Committee was empowered with determining which class of prisoners can be released on parole or on interim bail for such period as may be thought appropriate. The Bench suggested that each State/Union Territory consider the release of prisoners who have been convicted or are under trial for offences for which the prescribed punishment is up to 7 years or less, with or without fine and the prisoner has been convicted for a lesser number of years than the maximum.

• Directions for the interest of children who fall within the ambit of the Juvenile Justice Act (dated April 3, 2020)

In Suo Motu Writ Petition (Civil) No. 4/2020, In Re: Contagion of COVID-19 Virus in Children Protection Homes, a Bench of Justices LNageswara Rao and Deepak Gupta issued a slew of directions to prevent the spread of the Coronavirus in Child Care Institutions (CCIs). These include children in need of care and protection, children in conflict with the law in Observation Homes, and children in foster and kinship care.

The Child Welfare Committees were directed to monitor cases telephonically for children who have been sent back to their families and to coordinate with the District Child Protection Committees and Foster Care & Adoption Committees and establish online help desks and support systems for queries at the state level for children and staff in CCIs.

It was also directed that the Juvenile Justice Boards and Children Courts take measures for organizing online video sessions for conducting inquiries and to consider taking steps to release children alleged to be in conflict with law, unless there are clear and valid reasons for the application of the proviso to Section 12, JJ Act, 2015.

The authorities were also directed to ensure adequate budgetary allocation to meet the costs that are likely to arise for the effective management of the pandemic. CCIs were directed to take necessary steps to practice, promote and demonstrate positive hygiene behaviour and monitor their uptake, conduct regular screening of children lodged in institutions, and follow the Health Referral System.

- Guidelines for court functioning through video conferencing during COVID-19 pandemic (dated April 6, 2020)
- In Suo Motu Writ Petition (Civil) No. 5/2020, In Re: Guidelines for Court Functioning Through Video Conferencing During COVID-19 Pandemic, a Bench of CJI Bobde and Justices DY Chandrachud and LNageswara Rao directed that all measures shall be taken by the Supreme Court and by the High Courts to reduce the need for the physical presence of all stakeholders within court premises and to secure the functioning of courts in consonance with social distancing guidelines.
- It was directed that the Supreme Court of India and all High Courts are authorized to adopt measures required to ensure the robust functioning of the judicial system through the use of video conferencing technologies. It was directed that the district courts in each state shall adopt the mode of video conferencing prescribed by the concerned High Court, and the Court shall duly notify and make available the facilities for video conferencing for such litigants who do not have the means or access to video conferencing facilities.
- It was further directed that video conferencing shall be mainly employed for hearing arguments whether at the trial stage or at the appellate stage and the presiding officer shall have the power to restrict entry of persons into the court room.
- Conduct of COVID-19 tests should be done free of cost (dated April 8, 2020)

In Writ Petition (Civil) Diary No(s). 10816/2020, Shashank Deo Sudhi V. Union of India, a Bench of Justices Ashok Bhushan and S Ravindra Bhat directed that the tests relating to COVID-19, whether in approved government laboratories or approved private laboratories, shall be done free of cost. It was further directed that tests relating to COVID-19 must be carried out in NABL accredited labs or any agencies approved by WHO or ICMR.
• COVID-19 tests by private labs should be done free of cost only for EWS, those eligible under Ayushman Bharat Yojana (dated April 13, 2020)

Modifying its order dated April 8, the Bench directed that free testing for COVID-19 shall be carried out for persons eligible under Ayushman Bharat Pradhan Mantri Jan Aarogya Yojana and any other category of economically weaker sections of the society. It was also directed that the Ministry of Health and Family Welfare may consider as to whether any other categories of the weaker sections of the society were also eligible for the benefit of free testing.

The Supreme Court has risen to the occasion and has put its best foot forward to preserve the rule of law in our country envisaged by the Constitution of India, even at this cataclysmic juncture. The High Courts of our country have also taken steps in ensuring that access to justice remains ubiquitous and approachable.

The use of modern technology for enhancing justice dispensation has been profusely encouraged by the Supreme Court of our country so that hearings can be carried out effectively and successfully through virtual mode.

**Conclusions**

The RTI Act as introduced in the year 2005 lays down comprehensive statutory and procedural method in order to guarantee the right to freedom of speech and expression to Indian citizens and more necessarily “Right to Know”. The Supreme Court of India had, in several judgments prior to enactment of the RTI Act, upheld the Constitutional provisions to enshrine Right of Information as the fundamental right which is provided as right to freedom of speech and expression and also in right to life. Under the RTI Act, the government bodies and government-funded agencies are required to designate a Public Information Officer (PIO) whose responsibility is to make sure that the information which has been requested is disclosed to the applicant within the duration specified which is 48 hours in cases where information required is related to the existence or independence of a person, to up to 30 days. The Act has been seen to be inspired by earlier legislations which were enacted in states including Maharashtra, Goa, Karnataka, Delhi amongst others. The implementation of the RTI Act helped citizens in attaining the right to information of varying degrees with respect to activities of any state or central government body. Recently, there have been disclosures of various high-profile cases which have revealed corruptions in different schemes of government including scams in public distribution systems, disaster relief and construction projects amongst others. The law has been viewed as a milestone in the drive of India towards more directness, transparency and responsibility in the government.

But, despairingly the recent situation of pandemic COVID-19 has let the constitutional spirit behind the legislation to a halt and due to which the right as guaranteed by the Indian Constitution in the hands of the citizens has been severely hampered. Several Information commissions across the country have stopped or limited the working. The citizens are facing hard time to approach the information commissions for getting the information sought or to file appeal against the non-disclosure of information by the PIO of the CPIO due to non-availability of standard operating procedures in the tough time of pandemic which is experienced by the world for the first time ever.

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**References**

1. Act no. 22 of 2005
4. See Section 7 of the RTI Act, 2005
7. 21 State Information Commissions Did Not Hold any Hearings of RTI Applicants during Lockdown:

Effect of Bosu Ball Versus Swiss Ball on Core Strength in Overweight and Obese Post Menopausal Working Women

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Abstract

Background: During post menopausal period, many changes take place in women physiologically. Among them core muscle weakness, pelvic floor dysfunction. There can be some measures taken for improving core strength in women. It leads to the cessation of ovarian estrogen production concurrent to the deterioration of muscle function. So this study is an effort made to check either bosu ball is effective or swiss ball.

Aims and Objective: To find the effect of bosu ball versus swiss ball for core strengthening in post menopausal women. Objectives: to compare effect of bosu ball and swiss ball for core strengthening in post menopausal women.

Subject and Methodology: The experimental study was carried over a period of 12 weeks. Sampling size includes total 24 subjects. 12 in each group, materials used were bosu ball, Swiss ball, pen, paper. Study was conducted in Krishna college of physiotherapy.

Result: And it was found that for bosu ball; before protocol trunk stability test and abdominal curl test was performed and it was found that by 70% the strength had been improved in population who followed the bosu ball protocol. For trunk stability test the p value was <0.0001 which was extremely significant. For abdominal curl test the p value was <0.0001 which was extremely significant. The results for swiss ball by trunk stability test were, p value was <0.22 which was not significant. For abdominal curl test the p value was <0.20.

Conclusion: Bosu ball was effective than swiss ball.

Keywords: Post menopausal women, bosu ball, swiss ball, core strength.

Introduction

“PAUSE”

Yes, she just had her menopause.

Yes, she still yearns to live life to the fullest!

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What exactly is menopause, Menopause is defined as the time when there has been no menstrual periods for 12 consecutive months¹. Also it occurs when there is complete, or near complete, ovarian follicular depletion of females ovaries. It generally occurs at a median age of 51.4 years and menopause before the age of 40 years is considered abnormal. The months and years leading up to this are called perimenopause. Hot flushes, vaginal dryness, depression, sleep disturbances, joint pain, and cognitive changes are some of the pre warning signs of menopause¹.

Physiologically, a female ovary has the largest number of gametocytes during the 5th month of gestation and has approximately 1 million of gametocytes at birth
as women ages normal openings or follicular tubes in the body are closed, which reduces the number of gametocytes. As a result, at the time of menopause a women may have a few thousand or a few hundred gametocytes left. As the ovary produces three hormones: estrogen, progesterone and androgens. Among the estrogens, estrone (E1), estradiol (E2) and estriol (E3) are the three produced estrogens. Estradiol is the most potent natural estrogen and is produced during the monthly menstrual cycle. Fluctuations and deficiencies in estrogen levels cause many of the menopausal signs and symptoms. Natural menopause, pre mature of early menopause, surgical or induced menopause are some of the types of menopause(1).

Strengthening core has become a major trend in rehabilitation. It is a description of the muscular control required around the lumbar spinae to maintain functional stability(2). Core training excluding the diaphragm for old individuals can also improve balance ability. Strength exercises for muscles are therefore hypothesized to help improve balance ability during sitting without support. Contraction of trunk core muscles increases intra-abdominal pressure, providing stability and stiffness of the body(3). The core programme should progressed and planned gradually as exercising the core muscles is more than trunk strengthening(4). A variety of core exercises are used to develop core strength and core stability which are believed to be important for women. Curls up and sit ups are the most common abdominal exercises. Unstable surfaces, such as swiss ball, bosu ball have been used to increase the neuromuscular stress in the core muscle compared with a stable surface. In rehabilitation, BOSU and swiss ball may be beneficial because the body responds to the instability of the ball to remained balanced, engaging many more muscles. Swiss ball abdominal crunch is one of the exercise for core strengthening(8). The greatest benefit of moving an exercise onto an unstable surfaced is achieving a greater activation of the core musculature(9). An unstable surface increases activation of the rectus abdominis muscle and allows for greater activity or exercises when compared to a stable surface. Core stability exercises on and off a swiss ball(10), Exercise such as a curl ups on an exercise ball yields a greater amount of electromagnetic field compared to exercise on a stable platform. Performing standard exercises, such as a push up on an unstable surface can be used to increase activation of core trunk stabilizers and in turn provide increased trunk strength and greater resistance to injury.

Aims: To find the effect of bosu ball versus swiss ball for core strengthening in post menopausal women.

Objectives:
1. To determine effect of bosu ball in post menopausal women.
2. To determine effect of swiss ball in post menopausal women.
3. To compare effect of bosu ball and swiss ball for core strengthening in post menopausal women.

Material: The experimental study was carried over a period of 12 weeks. Sampling size includes total 24 subjects. 12 in each group, materials used were bosu ball, swiss ball, pen, paper. Study was conducted in Krishna college of physiotherapy.

Methodology
The ethical clearance was taken from the institutional ethical committee of Krishna institute of medical sciences “deemed to be” university karad. A experimental study was conducted over period of 12 weeks in post menopausal women in musculoskeletal department of Krishna college of physiotherapy. Prior consent was taken and study was explained to the participants. The participant were attended and assessed personally with 15 to 30 mins of session per day. Major outcome measure were swiss ball and bosu ball.

Procedure: Exercises on swiss ball:
1. Stability ball crunch: ask the subject to lie face up on the ball, with the ball under low back. Keep feet on the floor, hip width apart, and behind ears. Brace core, tighten glutes and slowly crunch upper body upward, raising shoulders off the ball and tucking chin to chest. Slowly lower upper body down to return to start.
2. Stability ball oblique crunches: procedure same as above. Brace core by pulling navel toward spine. Tightens glutes and slowly crunch up and to the right. Ask to lift shoulder blades off the ball and rotate upper body to the right. Lower the back down and repeat on the left side.

3. Ball crunch: legs elevated, lie on back, calves on top of the exercise ball and arms across chest. Roll shoulder blades up and lower back down after a short pause. To avoid strain in neck, ask the subjects to look straight up instead of looking at knees.

Exercises on Bosu ball:

1. Bosu one leg bridge: ball flat on floor. Lie down on back and place feet on top of the ball. Raise one leg towards the ceiling and push hips up again before touching the floor. Repeat for 10-15 repetitions on each leg.

2. Crunch: lay on bosu ball and bring feet towards the body. Place hands behind head, engage the abs, and slowly raise the upper body (looking upwards).

3. Sit ups: lay over the bosu ball. Raise arms towards the ceiling, engage the abs, and then raise the upper body and towards feet. Hold for a secs and return to starting position.

Inclusion Criteria:

1. Age group beyond 45-50 years.
2. Post menopausal women who were willing to participate.
3. Only working women are considered for the study.
4. BMI with overweight and obese grade I, grade II

Exclusion Criteria:

1. Recent fractures
2. Soft tissue injuries
3. Episodes of mechanical or specific back pain.
4. Carcinoma
5. Cardiovascular conditions.

Limitation:

1. Only post menopausal women are taken.
2. Only working women were included.
3. Only grade I, II obese women were included.

Suggestions and Recommendations:

1. This study can be done on large populations.
2. This study can be made more precise with more details.
3. Non working women can also be included.

Source of Funding: Krishna Institute of Medical Sciences.

Conflict of Interest: Nil

Data Analysis:

Table No 1: Trunk Stability Test for Bosu Ball

<table>
<thead>
<tr>
<th></th>
<th>Trunk Stability Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Protocol</td>
<td>30%</td>
</tr>
<tr>
<td>After Protocol</td>
<td>70%</td>
</tr>
</tbody>
</table>

P value $<$0.0001 in relation to protocol before and after is extremely significant.

Interpretation:

Table No 2: Abdominal Curl Test for Bosu Ball

<table>
<thead>
<tr>
<th></th>
<th>Abdominal Curl Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Protocol</td>
<td>30%</td>
</tr>
<tr>
<td>After Protocol</td>
<td>70%</td>
</tr>
</tbody>
</table>

P value $<$0.20 abdominal curl test in relation to before and after protocol is not significant.

Interpretation:

Table No 3: Trunk Stability Test for Swiss Ball

<table>
<thead>
<tr>
<th></th>
<th>Trunk Stability Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Protocol</td>
<td>45%</td>
</tr>
<tr>
<td>After Protocol</td>
<td>55%</td>
</tr>
</tbody>
</table>

P value $<$0.22 trunk stability test in relation to before and after protocol is very significant.

Interpretation:

Table No 4: Abdominal Curl Test for Swiss Ball

<table>
<thead>
<tr>
<th></th>
<th>Abdominal Curl Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Protocol</td>
<td>45%</td>
</tr>
<tr>
<td>After Protocol</td>
<td>55%</td>
</tr>
</tbody>
</table>

P value $<$0.20 of abdominal curl test in relation to before and after protocol is not significant.
Interpretation:

**Table No 5: Summary of Tests**

<table>
<thead>
<tr>
<th></th>
<th>Bosu Ball Before</th>
<th>After</th>
<th>Swiss Ball Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trunk Stability Test</td>
<td>30%</td>
<td>70%</td>
<td>45%</td>
<td>55%</td>
</tr>
<tr>
<td>Abdominal Curl Test</td>
<td>30%</td>
<td>70%</td>
<td>45%</td>
<td>55%</td>
</tr>
</tbody>
</table>

**Table No 6: Summary of Results**

<table>
<thead>
<tr>
<th></th>
<th>Standard Deviation</th>
<th>P Value</th>
<th>T Value</th>
<th>Interference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bosu Ball</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before Tst</td>
<td>1.9</td>
<td>&lt;0.0001</td>
<td>9.62</td>
<td>Extremely significant</td>
</tr>
<tr>
<td>After Tst</td>
<td>1.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before Act</td>
<td>2.2</td>
<td>&lt;0.0001</td>
<td>6.99</td>
<td>Extremely significant</td>
</tr>
<tr>
<td>After Act</td>
<td>4.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Swiss Ball</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before Tst</td>
<td>1.11</td>
<td>&lt;0.22</td>
<td>1.26</td>
<td>Not significant</td>
</tr>
<tr>
<td>After Tst</td>
<td>0.66</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before Ast</td>
<td>0.68</td>
<td>&lt;0.20</td>
<td>1.30</td>
<td>Not significant</td>
</tr>
<tr>
<td>After Ast</td>
<td>0.54</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Result**

After analyzing the data, significant effect was found on post menopausal women after the protocol by using bosu ball and swiss ball respectively. It was found that bosu ball was effective than swiss ball based on the tests such trunk stability test and abdominal curl up test. Before and after protocol reading were assessed accordingly. The results were as follows: Three exercises in each group were given i.e stability ball crunch, stability ball oblique crunch, and ball crunch on swiss ball and one leg bridge, crunches, and sit ups on bosu ball. The study was carried for 12 weeks. And it was found that for bosu ball; before protocol trunk stability test and abdominal curl test was performed and it was found that by 70% the strength had been improved in population who followed the bosu ball protocol. For trunk stability test the p value was <0.0001 which was extremely significant, t value was 9.62, standard deviation before and after protocol was 1.9 and 1.6 respectively. For abdominal curl test the p value was <0.0001 which was extremely significant, t value was 6.99 and standard deviation before and after was 2.2 and 4.4 respectively. The results for swiss ball by trunk stability test were, p value was <0.22 which was not significant, t value was 1.26, standard deviation before and after the protocol were 1.11 and 0.66 respectively. For abdominal curl test the p value was <0.20, t value was 1.30 and standard deviation before and after the protocol were 0.68 and 0.54 respectively.

**Discussion**

Menopause is defined as the time when there has been no menstrual periods for 12 consecutive months\(^1\). Also it occurs when there is complete, or near complete, ovarian follicular depletion of females ovaries. Therefore, the objective of this study was to find effect of bosu ball versus swiss ball exercises training and find whether bosu ball is effective or swiss is effective.

The study shows that how much the effect is caused by which treatment protocol in post menopausal women. The study is one of its kind providing basic information regarding the effect of bosu ball versus swiss ball on core strength in overweight and obese post menopausal working women. To our knowledge no such study is conducting to find out the effect of bosu ball versus swiss ball on core strength in overweight and obese post menopausal working women.

Two tests were carried out such as trunk stability test and abdominal curl test which were conducted among 24 subjects, 12 in each group over a period of 12 weeks.
was studied in the population including working women in any field. They were also examined according to the their age beyond 45 years, body mass index ranging from 25 to 39.9 according to the classification discovered by WHO. The results were achieved by performing the tests. In this study Age group beyond 45-50 years was included, only working women were considered and BMI with overweight and obese grade I, grade II were included. A exercise protocol was given which includes exercises such as Stability ball crunch, Stability ball oblique crunch and ball crunch for swiss ball. bosu one leg bridge, crunch and sit ups for bosu ball were performed. And a significant result was found. After that data analysis was carried. The readings were compared of before and after protocol as follows: based on two tests which were trunk stability test and abdominal curl test to check the core muscle strength. And it was found that for bosu ball; before protocol trunk stability test and abdominal curl test was performed and it was found that by 70% the strength had been improved in population who followed the bosu ball protocol. For trunk stability test the p value was <0.0001 which was extremely significant, t value was 9.62, standard deviation before and after protocol was 1.9 and 1.6 respectively. For abdominal curl test the p value was <0.0001 which was extremely significant, t value was 6.99 and standard deviation before and after was 2.2 and 4.4 respectively. The results for swiss ball by trunk stability test were, p value was <0.22 which was not significant, t value was 1.26, standard deviation before and after the protocol were 1.11 and 0.66 respectively. For abdominal curl test the p value was <0.20, t value was 1.30 and standard deviation before and after the protocol were 0.68 and 0.54 respectively.

In another study “The effects of training by virtual reality or gym ball on pelvic floor muscle strength in postmenopausal women: a randomized controlled trial” which was studied by Martinho N, Silva V. A randomized controlled trial was conducted with 60 postmenopausal women, randomly allocated into two groups: Abdominopelvic training by virtual reality APT_VR (n=30) and PFMT using a gym ball – PFMT_GB (n=30). Both types of training were supervised by the same physical therapist, during 10 sessions each, for 30 minutes. The outcome endurance was higher in the APT_VR group (p=0.003; effect size=0.89; mean difference=1.37; 95% CI=0.46 to 2.28). Conclusion: Both protocols have improved the overall PFM strength, suggesting that both are equally beneficial and can be used in clinical practice.

In the current study, it was seen that the treatment protocol given on BOSU ball was more effective than the treatment given on swiss ball. Many other etiological factors can be responsible for reduced core strength. however further studies are required with a large sample size to get a deep insight about the effect.

**Conclusion**

By this study, it was found that bosu ball was more effective than swiss ball with p value <0.0001 which was extremely significant.

**Ethical Clearance:**

**References**


COVID-19 in Children and Policy of the Indonesian Government to Begins New School Year

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Abstract

The New Coronavirus 2019 pandemic (COVID-19) is the world’s health crisis. Various aspects of the virus are still unknown. As the COVID-19 virus became more prevalent, the Government of Indonesia issued several types of policies, including in the education sector, by closing schools as an emergency measure to prevent the spread of infection. But when the start of the new school year, it makes parents who have school-age children start to worry, if it will start during this pandemic. The study aimed to find a picture of the impact of the Ministry of Education’s policy discourse on the start of a new school year for school-aged children. The study design was conducted with a descriptive analysis approach which was carried out through a literature review. The results of the study found that although children tend to have mild symptoms of COVID-19, it did not mean we should ignore those who have this disease. We still need to take steps to prevent them from becoming infected. Policies for reopening schools must be carefully considered. Among them were waiting for conditions to be safe from the impact of COVID-19 following the decisions of the COVID-19 Task Force and the Ministry of Health, as well as the local government as the person in charge of basic education.

Keywords: COVID-19, new school year, health policy.

Introduction

COVID-19 pandemic is a health crisis in the world. Various aspects of the virus are still unknown. Studies show that the transmission of the COVID-19 virus is through respiratory droplets and direct contact with secretions containing the virus. The cause of the high prevalence of this disease can be attributed to the long incubation period and its transmission in periods without symptoms, mild, or before it appears. It also found viral symptoms in people with chronic diseases, such as cardiovascular disease, diabetes, cancer, hypertension, and chronic respiratory diseases. The risk of viral infection increases with age¹.

As the COVID-19 virus became more prevalent, the Government of Indonesia issued several policies, including in the field of education. The government closed schools nationally as an emergency measure to prevent the spread of infection. Massive efforts were made by schools and teachers at all levels of education to create lectures, or provide course material, and examinations, online, in a short time. Online learning activities are not a new thing for school children, because before they were accustomed to doing semester tests online. It’s just that now they have to start adapting again by providing online subject matter. The virtual semester has also begun in many parts of the country that were affected first. This policy helps alleviate many parents’ concerns about their children’s educational attainment, by ensuring that school learning is largely uninterrupted. But when the new school year will start

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again, parents who have school-age children will start to worry, if it will start during this pandemic. Based on the background description, the study aimed to find out the impact of the Ministry of Education’s policy discourse on the commencement of the new school year in schools with children of school-age children.

Method

The method used in this research was the study of literature, which was the study of the object of research in the form of literary works, whether in the form of scientific journals, books, articles in the mass media, or statistical data. The literature would be used to examine research problems and how to deal with them. The nature of the study conducted was descriptive analysis which was to give a picture to the reader so that it could be a medium of public education. The type of data used was secondary data.

Findings:

COVID-19 in children: COVID-19 is a new type of coronavirus that has infected people from many countries in the world. Early reports indicate that children are relatively protected from this virus compared with adults. The mission of the World Health Organization’s collaboration with China in February 2020 on Coronavirus Disease found that only 2.4% of cases were in those under the age of 19\(^2\). Besides, the severity of the disease in infected children is less than the total infected population. Only 2.5% of children suffer from severe illness (compared to 13.8% overall) and 0.2% of children suffer from critical illness (compared to 6.1% overall). Severe illness is defined as dyspnoea, tachypnoea, hypoxia, or infiltrates that affect more than 50% of the lung space within 48 hours, and critical illness is defined as respiratory failure, septic shock or multi-organ failure. Although the number of reported cases is quite small, young infants appear to have a relatively low level of influence; one study of nine infected infants found that none needed intensive care or had significant complications. However, certain pediatric populations, such as babies born prematurely, tend to be very vulnerable, with one death confirmed in this subgroup. Further evidence is likely to emerge over time about how children globally will overcome this epidemic disease\(^3\).

The immune systems of children and adults are different, both in terms of their composition and functional responsiveness\(^4\). Besides, there are differences in the immune systems of very young children, preschoolers, and adolescents. During the early weeks of life, newborn human babies are faced with a series of exposures to new environments that undergo dramatic changes\(^5\). Another difference between newborns and older children is the presence of several maternal antibodies during the first months of life. These antibodies do not include new viruses such as SARS-CoV2\(^5\). One possible explanation for the presentation of COVID-19 milder disease in children is that children have a qualitatively different response to the SARS-CoV2 virus than adults. Another possibility is that the presence of other simultaneous viruses in the lung mucosa and airways, which is common in children, can limit the growth of SARS-CoV2 through direct virus-to-virus interaction and competition\(^7\). This is consistent with data emerging from the current pandemic, which has shown a relationship between the number of copies of the virus and the severity of COVID-19\(^8\). This condition could also explain some of the tragic deaths of health care workers, who may have been exposed to a large number of SARS-Cov2 viruses.

Another possible theory for mild COVID-19 infection in children is related to differences in the expression of angiotensin-converting enzyme (ACE) 2 receptors needed for binding to SARS-Cov2 infection. These receptors are expressed in the airways, lungs, and intestines, but not in immune cells\(^9\). Treatment with ACE inhibitors or angiotensin receptor blockers induces ACE2 expression. Both of these therapies are common in adults with hypertension and less frequently in children. This has led some to believe that increased ACE2 expression may explain worse results in adults infected with SARS-Cov2, but others have reported the protective effect of ACE2 during lung infections\(^10\). Although children tend to have mild forms of COVID-19 symptoms, that does not mean that we should ignore those who have this disease.

Government Policies in the Field of Education:

The government has issued a policy for education which is to close schools and provide subject matter and examinations online. Although these steps and efforts are highly commendable and necessary, there is reason to be worried because the closure of long schools and confinement at home during an outbreak may harm the physical and mental health of children\(^11,12\). This can be proven when inviting or when children leave school activities (for example weekends and school holidays), they are physically less active, have more time to play
with gadgets, irregular sleep patterns, and fewer dietary patterns. Resulting in weight gain, and loss of physical fitness\textsuperscript{13}. Such negative effects on health are likely to be far worse when children are locked up in their homes without outdoor activities and interactions with friends of the same age during the outbreak.

Perhaps this pandemic issue is more important, but don’t overlook the psychological impact on children and adolescents. Stress resulting from prolonged quarantine duration, fear of infection, frustration and boredom, inadequate information, lack of direct contact with classmates, friends, and teachers, lack of personal space at home, and family financial losses, can have more problematic effects and lasts long in children and adolescents\textsuperscript{12}. According to Sprang and Silman show that the average post-traumatic stress score is four times higher in children who have been quarantined than those who are not quarantined\textsuperscript{14}. Furthermore, the interaction between lifestyle changes and psychosocial stresses caused by confinement at home can further exacerbate the effects on a child’s physical and mental health, which can lead to recurring circles.

To reduce the consequences of confinement at home, governments, non-governmental organizations, communities, schools, and parents need to be aware of the downside of this situation and do more to deal with these problems immediately. The experience learned from previous outbreaks can be useful for designing new programs to overcome this problem in Indonesia\textsuperscript{15}.

The government needs to increase awareness of the potential physical and mental health effects of confinement at home during this unusual period. The government must also provide guidelines and principles for effective online learning and ensure that the contents of school subject matter meet the educational requirements. But it is also important not to burden students. The government might mobilize available resources, involve non-governmental organizations, and create a platform to gather the best online education courses on healthy lifestyles and psychosocial support programs available for schools. For example, in addition to innovative courses for a better learning experience, promotional videos can be useful to motivate children to have a healthy lifestyle at home by increasing physical activity, having a balanced diet, regular sleep patterns, and good personal hygiene. These actions make this educational material truly effective, appropriate for their age, and interesting\textsuperscript{16}.

The community can also function as a valuable resource in managing family difficulties. For example, a committee of parents can work together to bridge student needs with school requirements and advocate for children’s rights to a healthy lifestyle. Psychologists can provide online services to deal with mental health problems caused by domestic conflict, tension with parents, and anxiety due to this pandemic\textsuperscript{15}. Social workers can play an active role in helping parents deal with family problems arising from the situation if needed. Social safety nets or some kind of cooperative of parents can be very useful for disadvantaged families or single parents\textsuperscript{17}. These services make it easily accessible to them when needed.

Schools have an important role, not only in presenting educational material to children but in offering opportunities for students to interact with teachers and get psychological counseling. Schools can actively promote health-conscious schedules, good personal hygiene, encourage physical activity, proper diets, and good sleep habits, and integrate health promotion materials into the school curriculum\textsuperscript{11}.

In terms of quarantine or at home, parents are often the closest and best source for children to seek help. Closed or open communication with children is the key to identifying any physical and psychological problems and to entertain children in prolonged isolation\textsuperscript{18,19}. Parents often become important role models in healthy behavior for children. Good parenting skills are very important when children are locked up at home. In addition to monitoring children’s performance and behavior, parents also need to respect their identity and needs, and parents need to help children develop self-discipline skills. Children who are constantly exposed to news related to the epidemic, so having direct parent conversations with children about this problem can reduce their anxiety and avoid panic\textsuperscript{19}. Quarantine or home activities alone can offer a good opportunity to increase interaction between parents and children, involve children in family activities, and improve their independent skills\textsuperscript{18}. With the right care approach, family ties can be strengthened, and the psychological needs of children are met\textsuperscript{20}.

Indonesian Government’s Policy to Begin a New Academic Year: The Ministry of Education will reopen schools simultaneously, starting a new school year, but not with face-to-face teaching and learning method. The method of learning for the new school year will
depend on the conditions of each region. Terms related to this condition will later be announced by the Ministry of Education, and explain that the start date of the new school year can vary by region because the education calendar is made by the local government. Generally, the new school year begins in the third week of July. But this is only for areas in the green zone and eligible. In anticipation of the fact that the pandemic has not ended until the end of the year, the Ministry of Education prepares a home learning scenario until the end of 2020. To date 97.6% of schools conduct distance learning, 54% have done full distance learning, namely teachers and students teaching and learn from home. The remaining 2.4% have not done it because the area is not affected by the pandemic or do not have supporting devices. Besides, the Ministry of Education has made several programs such as Learning Houses, Learning from Home, on television, and radio to support the learning process.

Other news added that the reopening of schools is also awaiting safe conditions from the effects of COVID-19, following the decisions of the COVID-19 Task Force and the Ministry of Health. Therefore, optimistic estimates of schools opening in mid-July according to the education calendar, concerning the health protocol. If by mid-July the COVID-19 case was still high and large-scale social restrictions were still in place, distance learning for early childhood education, basic education, and secondary education would continue.

Conclusions

Even though children tend to have mild forms of COVID-19 symptoms, that does not mean that we should ignore those who have this disease. We still need to take steps to prevent them from becoming infected if we want to reduce the pandemic. Children may be able to transmit the virus, and they have been found to store large amounts of the virus, even without showing symptoms but they are not aware of it.

The policy to reopen schools must take into account the various related parties, including waiting for safe conditions from the impact of COVID-19 following the decision of the COVID-19 Task Force and the Ministry of Health and local government as the person in charge of basic education. The risk is too great for the education sector because what is faced is children. In addition to having a bad impact on students, the government will also get a bad spot, if it is mismanaged and results in new clusters.

Acknowledgments: The author would like to thank Universitas Airlangga, which has allowed completing this final project.

Source of Funding: Self-funding

Conflict of Interests: Nil

Ethical Clearance: The study was conducted using secondary data that has been published so that ethical clearance is not needed for implementation.

References


The Kinetic Family Drawing Test for Evaluating Interpersonal Dynamics in Families: A Case Study

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Abstract

The purpose of this study is to evaluate interpersonal dynamics through Kinetic Family Drawing (KFD). Art Based Therapy (ABT) can be used in situations where talk therapies and counselling skills are least effective. It is especially helpful for people in crisis and those who are experiencing extreme psychological states. This case study has employed The Kinetic Family Drawing (KFD) to diagnose and treat 62 years old married woman with complaints of sadness, uncertainty & fear. This ABT program comprised of 3 sessions in which the Burns and Kaufman’s (1972) Kinetic Family Drawing (KFD) was used. In each session the client was made to draw a picture on a sheet of paper (8.5” x 11”) 4. The picture drawn by the client was subsequently analysed using focal points and the results were discussed with the client. The outcome of the present study helped the client to get insight into her problem and regain her self-confidence and improve relationship with her family members.

Keywords: Art Based Therapy, Kinetic Family drawing, Case study, Insight building, mental health, self–confidence, family dynamics.

Introduction

Diverse art forms have been an essential part of human life since primeval period. For generations art have been put into practice in every culture to articulate, generate, and communicate the needs, desires, and ideas among human beings. Arts-Based Therapy (ABT) is a term coined by World Centre for Creative Learning (WCCL) Foundation in 2001 to represent the use of multiple art forms and their combinations in therapy.

The formal practice of art therapy has its origins in the mid-20th century in Europe, with the coining of the term being attributed to British artist Adrian Hill in 1942. By working to bring the conscious, unconscious and subconscious into expressive and tangible forms, the creative processes involved in art therapy have been praised for their ability to encourage personal growth, mindfulness, and self-discovery. The client creates art images ‘to help express who they are, to express feelings and ideas, and to enhance life through self-expression’. Analysing the drawings of the client enables health professionals understand wide spectrum of client’s mental health issues.

The purpose of the present study: The main objective of this study is to enable the client to release her feelings, emotions, and worries and help her understand the family dynamics and improve relationship with family members.

Method

Sample: The client is a 62-year-old married woman (housewife) with prolonged history of psychological and familial issues. The client has a past history of psychological treatment which did not help her fully.

Tool: The Burns and Kaufman’s Kinetic Family Drawings (KFD) technique was used for the present study. The KFD was created as an extension of the Family Drawing Test 4. The directions given to the client is stated as follows: “Draw a picture of everyone in your family, including you, doing something, some kind of
action. Try to draw whole people, not cartoon or stick people. This picture is meant to elicit the person’s attitudes toward his or her family and the overall family dynamics.

Procedure: The kinetic family drawing was administered on the client. In each session the client was instructed to a draw picture based on KFD instructions on a sheet of paper (8.5” x 11”). The pictures were analysed and discussed using focal points.

1st Session: After the intake session, 1st session of art therapy was planned. “The client was instructed to draw her present family doing something.”

![Drawing 1: 1st session (November 2019)](image)

Session 1: Analysis of focal points: The client is a 62-year-old married woman (housewife) with prolonged history of psychological and familial issues. The family consisted of the client, her spouse (72, retired from business) and daughter (31, working as project manager). The client has a past history of psychological treatment which did not help her fully. The client has certain issues with her family members, and she is not happy with her present situation. The client appeared sad as her daughter has been facing issues in her marriage. The client had to leave her job to help her daughter.

In figure 1-seven characteristics dominated KFD-Lining on the bottom of the paper, Underlining, X’s, light (candle), placement of figure, Size of figures, elevated figure.

“Lining on the bottom of the paper is typical of children who feel instability in the home and are trying to maintain stability by creating a very solid foundation.” The client had drawn a table beneath her leg, which indicates that she feels instability in her house and she might be looking for some ways to create stability.

Underlining- “the instability reflected by such lining is focus on an individual figure, in which case only that figure will be heavily underlined. Underlining at the base of the drawing reflects the extreme tension in the family, unstable relationship symbol of that which links to source of nurturance.” Here the table drawn beneath the leg of the client’s spouse indicated underlining. May be the client’s spouse is undergoing lots of stress and instability, looking for attention and his need for nurturance is high. The client stated that she is not able to provide enough support to the spouse.
X’s indicates “the person is struggling for love and warmth”. The client has drawn two candles (energy) with the cross in the centre suggesting the need for love, warmth and direction in her life. There may be possibility that the client is inhabited by a strong conscience or superego. The client has also drawn source of light (Energy) suggesting “There is very little warmth and love in the family. The person must be of obsessive need for warmth and love.” Elevated figure—“A dominant person will be placed high above the rest of the figures”. The client has drawn her daughter elevated which shows that she is powerful and aggressive in the family.

“The placement and size of the figures in the drawing shows, large figures, perceptions of power or aggressiveness and small drawing of the self indicates poor self-concept and feelings of insignificance. When an individual draws the self-next to a significant other, it may indicate that the person likes that individual, wishes to be closer, and wants more attention.” The client drew herself, daughter and her spouse at distance from each other. The daughter has been drawn the largest, may indicate that she is powerful and aggressive in the family. The spouse is the smallest relative to family members suggesting that he may have feeling of insignificance and poor self-concept. The client has drawn herself next to her daughter suggesting that she is close to her and helping her deal with marital difficulties.

2nd Session: The first session of KFD was an eye opener for the client. The client decided to come again as the insights from the first session were very helpful. This session was approximately three months after the first session.

Session 2: Analysis of focal points: The second KFD (figure 2) defines the family dynamics and progression of therapy. The client is feeling much calmer & positive. The conflict with her daughter & spouse is still present as she has encapsulated them in the drawing. “Encapsulation is the encircling of individual family member, with an element of tension in the family. Theoretically it is thought to reflect isolation, rejection, threat and adjustment.”

The client depicts her daughter and spouse playing carom enclosed by large chair. Throughout the therapy the client was feeling unhappy about her daughter’s life and she was looking forward to get some help in that
direction. In drawing two the need for love and warmth has taken a form of sun\(^1\) (energy) instead of candles\(^5\). There is no X drawn in the second drawing suggesting that the struggle for love and warmth was resolved by the client by getting into religious practices. Placement of figures has changed; the client drew herself, daughter and her spouse around the dinner table which shows improvement in relationship. Daughter is still placed as an elevated figure. There is no line drawn at the bottom of the page suggesting that the client need for support has been taken care either by the family member or by the counsellor. Compartmentalization is “as an intentional separation of family figures through lining. This probably reflects the importance of boundaries and beginning of separation for the people living in the family”\(^4&5\). The client has used compartmentalization by separating the family figures through curtain lining. The client is trying to create a boundary between herself and her daughter. Some new elements like flowers and trees were added. “Flowers& trees represent love of beauty and the growth process”\(^4&5\). It symbolizes client’s religious and spiritual growth. Religious practises have made the client emotionally stable to handle her conflicts\(^11\). Table at the centre of the picture depicts obsessive need for attention and food.”\(^10\) This may suggest the client is not getting enough attention and acknowledgement from her spouse and daughter. In summary the second drawing reinforces several basic themes present in the first drawing but it also demonstrates a clear improvement, which was supported by client’s ve

3rd Session: After the second session of KFD the client has started looking at life with a different perspective. The client is feeling calmer & positive.

Session 3: Analysis of focal points: In drawing three, the client presents herself united with the family. The conflict with her daughter & spouse is still present as there is a need to encapsulate. The client depicts her daughter and spouse eating food enclosed by chair. The compartmentalization is removed, indicating the closeness & togetherness of the family. Placement of figures is around the table\(^10\) suggests need for attention. They all are eating dinner together shows the relationship has improved significantly. Absence of Elevation of figure (daughter) depicts improvement in her relationship. There is no line drawn at the bottom of page suggest stability in her family life. The need for love and warmth has taken a new representation in
form of light bulb. It indicates that the client is still striving for love & warmth. Absence of Flowers and trees suggests client’s satisfaction about her spiritual development. In summary the third drawing reinforces several basic themes present in the first & second drawings, but it also demonstrates an understandable change which was supported by client’s verbal reports.

**Discussion**

The aim of this case report was to explore the role of KFD, bringing in insight/understanding in family dynamics and relationship of a female client and help her improve relationship with family members. The finding on the first drawing indicated that the client feels that there is relationship and communication issue in the family. The client feels unheard. The client is looking for some support in the family and she is not fully involved in life. Even though the client is saying that her relationship with daughter is good but the distance shown between them is contradicting her statement. The findings were discussed with the client that helped her create insight and awareness about herself and the family which was taken up into the counselling. Family drawing assessments are an effective instrument for exploring more subjective, personal, and unconscious aspects of representational models of the self in relation to family. The second drawing shows united family. The struggle for love and warmth was resolved by the client by getting into religious practices. Religious practises have made the client emotionally stable to handle her conflicts. Some new elements like flowers and trees were added in drawing indicating client’s growth. The client has used Compartmentalization to create boundaries by separating the family figures through curtain lining. Finding on the third drawing shows the client can manage a much better relationship with her husband and daughter. There is lots of laughter and Happiness in the family, which was indicated by the picture of family having dinner together. Presence of encapsulation in the third drawing suggests the client still feeling suffocated and she needs boundary drawn among the family members. She wants family members to take up responsibility of their own life. This case study suggests that KFD resulted in insight building and conflict resolution among family members. Information found in KFD combined with clinical interviews, proved invaluable in setting therapeutic goals with the client, repeated themes and focal points suggest deep-rooted conflict and anxiety.

**Conclusion**

Diagnostic procedures such as the KFD offer easy and accurate access to information regarding attitudes and conflicts within the family. We believe that the KFD can be used as a valuable diagnostic tool to understand the intervention in more depth. The client indicated that she became more tolerant and accepting towards herself and family members. She noted a softened attitude towards herself and her complaints towards the end of art therapy.

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**Ethical Clearance:** Ethical clearance is taken from Center for Academic Research (CARE) Annamalai University, Psychology wing.

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A Study on the Patterns of Drowning Cases Brought for Medico-legal Autopsy

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Abstract

Drowning is a form of death in which the atmospheric air is prevented from entering the lungs due to the submersion of the body in water or any other fluid medium¹,². Drowning can be classified as wet drowning (fresh or salt water), dry drowning, secondary drowning and the immersion syndrome or hydrocution (cold water drowning).²,³,⁴,⁵ Drowning is an important public health issue with major impacts on human resource which is a preventable phenomenon. According to National Crime Records Bureau, Ministry of Home Affairs in 2014, in India, death due to drowning was 6.6%, making it third largest cause of death in India. India is a vast country having plenty of water bodies and an extensive coastline and under such conducive circumstances, cause of death due to drowning is a frequent event where medico-legal experts are called upon to investigate. With a view to investigate the epidemiological factors, a study was conducted in the Deptt. of Forensic Medicine, Gauhati Medical College for a period of 1 year. In our study we found that most of the victims were males (82%) in the 31- 40 years age group (24.4%). Most of the victims had drowned in fresh water (94.5%) and running type (63.8%). A total of 34 cases constituting 26.77% had external injuries. Most of the cases were accidental in nature (78%). An exhaustive study to unearth these socio-demographical factors of drowning, hence should be conducted, to analyze their impact on population and its prevention.

Keywords: Drowning, fresh water, accidental, prevention.

Introduction

India is a vast country blessed with natural resources of water bodies. But often this has led to inevitable loss of human life by the act of drowning. Drowning deaths are often unpredictable and poses variety of questions for a forensic expert. The WHO reports nearly 3,60,000 drowning deaths each year⁶, of which approximately 90% occur in low-income and middle-income countries (LMIC)⁷. India contributes significantly to the global burden of drowning, with national drowning deaths accounting for 17% of global unintentional drowning mortality¹. With a coastline of over 8000km and extensive inland freshwater systems², a large proportion of India’s population is regularly exposed to water. Many waterbodies are located within or nearby community settings, particularly in rural areas. Cataclysmic weather events are common in many parts of the country, particularly in North-Eastern states including Assam and West Bengal. Over 12% of the country is prone to flooding and river erosion³. In India, accidental drowning is mostly common. Many valuable lives are lost during the period of floods. Sometimes accidental drowning can also occur in swimming pools due to jumping off from the high diving board causing to injury over the head after striking over solid surface, with resultant loss of consciousness and inhalation of water. In marine, air or rarely road transport accidents, the victim may be injured.

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or killed before entering the water. Person falling from docks, bridges may get his body strike on any heavy and hard objects, such as rocks or some solid obstruction. After immersion, the body may strike the rocks, coral or marine structures thereby producing injuries and as the body floats along the bottom, injuries may occur over the head, face, backs of the hands, knees and the toes. Accidental drowning in shallow water can occur in intoxicated, insane or epileptic individuals. Despite a number of drowning risk factors being common in India, little empirical data are available on the burden or context of drowning-related morbidity or mortality within the country. A better understanding of the context and trends of fatal and non-fatal drowning is required to inform appropriate prevention strategies.

**Aims and Objectives:**

1. To evaluate the present trends of drowning by appropriate statistical analysis
2. To analyze the effect of various socio-demographic factors upon drowning
3. To study the injuries associated with drowning.

**Materials and Method**

The present study has been carried out in the Department of Forensic Medicine, Gauhati Medical College upon the 127 drowning cases out of total 3,367 cases brought for autopsy by police from within the district administrative area of Kamrup, Assam and few referral cases from the neighbouring districts. 24 cases excluded via exclusion criteria. The study period extended for 1 year from 1st July, 2017 to the 30th June, 2018. The data was collected in pre designed proforma from autopsies, interviews of accompanying attendants and police, which were subsequently analysed and represented in the form of tables, graphs and charts.

**Inclusion Criteria:** All the cases brought for medico-legal autopsy to the mortuary in the department of Forensic Medicine, Gauhati Medical College & Hospital within the study period, where the cause of death was drowning.

**Exclusion criteria:** Decomposed cases and cases where the actual death was not due to drowning.

**Results and Observation**

During the period from 1st July 2017 to 30th June 2018, a total of 151 cases of drowning were registered for autopsy out of which 127 were selected based on exclusion criteria. We found that most of the victims were males (82%), in the 31-40 years age group (31 cases). (Fig-1) and belonged to rural locality (63.77%). Most of the victims had drowned in fresh water (94.5%) (Table-1) and running type (63.77%), which comprises rivers, streams etc. There were 2 cases in which drowning occurred in a swimming pool. (Table-2). Majority of the incidents occurred near place of residence or work (54%). The months of July registered the highest number of cases with 18 cases. (Fig-2). A total of 34 cases constituting 26.77% had external injuries. (Fig-3). Most of the cases were accidental in nature (78%) and the rest were suicidal.

![Fig. 1: Sex ratio and Age groups](image-url)
### Table 1: Type of Drowning

<table>
<thead>
<tr>
<th>Type of drowning</th>
<th>No. of cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh water</td>
<td>120</td>
<td>94.5</td>
</tr>
<tr>
<td>Shallow water</td>
<td>4</td>
<td>3.14</td>
</tr>
<tr>
<td>Secondary</td>
<td>3</td>
<td>2.36</td>
</tr>
</tbody>
</table>

### Table 2: Place of Drowning

<table>
<thead>
<tr>
<th>Place of drowning</th>
<th>No. of cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Running water</td>
<td>81</td>
<td>63.77</td>
</tr>
<tr>
<td>Stagnant water</td>
<td>41</td>
<td>32.3</td>
</tr>
<tr>
<td>Swimming pool</td>
<td>2</td>
<td>1.57</td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
<td>2.36</td>
</tr>
</tbody>
</table>

### Fig. 2: Month distribution

#### Fig. 3: Injuries detected
Discussion

The present study has been compared with similar studies conducted by various authors in different parts of the world. The comparison has been carried out in order to bring out similarity and variation of findings of the observation. During study, a total of 3,367 medico-legal autopsies were performed, out of which, 127 cases were considered based on inclusion and exclusion criteria. The study found that drowning cases mostly involved males with 82% cases similar to the works carried out by Donson H8 and Tokbi S9. The male preponderance may be attributed to the fact that males population outnumber females in our state and are more exposed to water sources such as irrigation and fishing. The age group 31-40 was the most commonly affected with 31 (24.4%) cases similar to the study of Chakraborty P et al10 but differs with Turgut A11 and Tokbi S9 who reported that for persons aged between 10–19 years, the death rate was the highest. The cause has been attributed to being the most productive population to earn livelihood. Most of the victims were from the rural background with 63.77% cases similar to Hossain M et al12 and Tokbi S9 but varying with the study of Auer A13 where urban dwellers (58.8%) was reported to be more. The findings are in expected lines owing to irrigation and fishing and abundant water bodies in rural areas. Fresh water drowning constituted nearly 94.5% of the cases. Palimar V14 and Tokbi S9 also noted similar findings. It is due to Assam having vast fresh water bodies with no coastline. Majority of the victims drowned in running water similar to findings of Tokbi S9 but varying with Chakrabarty P et al10 who found stagnant water bodies to be the most involved. Most of the victims drowned at a site near to their homes (54%). 51 cases drowned at a place near their work place. Racz E et al15 reported similar findings. Heavy rainfall in our state and floods and poor roads and demarcation attribute to these causes. The months of July registered highest 18 (14.17%) cases. Pal S K16 and Tokbi S9 reported similar findings to the study which is due to monsoon season and floods here. A few cases had injuries which mostly occurred in the head or face due to impact in the running water with underlying stones or objects similar to the study of Tokbi S9. Most of the cases were accidental in nature (78%). Mukherjee A A17 reported findings similar to the study. However Kumar A G V18 reported suicidal cases to be more common. The cause can be attributed to poor infrastructure and general lack of alertness amongst non-swimmers.

Conclusion

The present study was done with the aim of having an overview of the the epidemiology of all the ante-mortem drowning cases. Drowning cannot be stopped per se but few steps can be taken to prevent it. Drainage of unnecessary water accumulations, building flood control embankments, implementation and enforcement of mandatory isolation fencing for swimming pools should be done. Promotion of swimming programs for primary school children, increased awareness of drowning survival tactics, and train lifeguards for regular deployment in supervised swimming locations are the need of the hour. Increased education in boat safety regulations and training the general community in timely resuscitation manoeuvres can increase the survival prospects of drowning victims.

Ethical Clearance: Taken from Institutional Ethics Committee, Gauhati Medical College & Hospital, Guwahati-32.

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Conflict of Interest: Nil

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Assessment of the Knowledge and Attitude of Eligible Couples towards Tubectomy and Vasectomy

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Abstract

Background: The populace is quickly expanding and has become a significant issue with the populace developing at a yearly pace of 1.2%. India will have more than 1.53 billion people before the completion of 2030 with the masses improvement rate at 1.58%.

Materials and Method: A Non-Experimental Descriptive Survey Research Design was used. A sample was comprised of 50 males and 50 females belongs to peer group of 20-45 years. Purposive sampling technique was utilized to gather sample for additional investigation. The data was aggregated by applying selected variables, Structured Knowledge Questionnaire and Attitude Rating Scale.

Results: The result showed a significant association of knowledge of males with their selected variables. The calculated p value of males and females with selected variables of knowledge and attitude was non significant which showed that there was no association between the level of knowledge and attitude of males and females towards tubectomy and vasectomy.

Conclusion: It was concluded that Knowledge of the males and females regarding tubectomy and vasectomy was in average and Attitude was moderately favourable. There was not any relationship between knowledge and attitude of males and females regarding tubectomy and vasectomy.

Keywords: Knowledge, attitude, males, females.

Introduction

India is a second largest country because of its population that is 1,311,559,168 (1.31 billion), on the other hand China is the top largest country because of its population 1,380,914,176 (1.38 billion). These figures show that India came to for all intents and purposes 17.74 of the all out populace, which shows that every person out of six social orders is has a spot with India. Be that as it may, the crown of the world’s most prominent nation is China’s obligation from a long time. India is additionally expected to take a similar circumstance by 2030. With the people advancement rate by 1.58%, India is typical for over than 1.53 billion people before the completion of 2030¹ (Taneja, 2014).

According to the world health organization, 1 million conceptions takes place every day and about 50% of these conceptions are unplanned and 25% of them are unwanted (ladipo, 1999). Everyday about 150,000 unwanted pregnancies are terminated. (Etuk, 2003).

In India, The national Family Planning Programme was started in 1952 to making it the first country in the world to do so. In spite of this about 56% eligible couples in India are still unprotected against contraception³. (Reddy, 2003).
The contraception alludes to the avoidance of the origination by the utilization of different sexual practices, surgeries, synthetic compounds and medications. The main purpose of seeking contraception is to prevent the women from becoming unwanted pregnancy. That’s why it is considered as a contraceptive. Its main aim is to attain privacy and comfort in the physical or sexual relationship. In the society, the couples are allowed to enjoy and fulfill their sexual desires without fear of unwanted pregnancies. (Jain R, 2011).

So couples now a days confronting clashes with objectives of accomplishing fulfilling sexual coexistence and keeping their little family. In the event that individuals neglects to keeping their family little outcomes in undesirable pregnancies and unsafe premature births. On the off chance that the premature birth looking for is late or in unhygienic conditions or in the hands of hazardous suppliers, it can prompt concepive horribleness just as maternal mortality. (Jain r, 2011).

**Methodology**

This study was done in the month of February, 2019 in the Panjab state of India. A sample of 100 (50 Males and 50 Females) participated in this study with the prior permission from the sarpanches of Respective Villages. A Non Experimental Descriptive survey research design in which Males and females aged 20-45 years having one or more children with alertness, oriented and comprehend to respond, speak and understand Hindi, willing to participate and residing in selected rural villages of Rajpura, Punjab were included. Males and Females who were not accessible at the hour of information assortment were prohibited. A Non-Probability Purposive Sampling Technique was owned for data collection from the participants through the medium of Structured Knowledge Questionnaire and Attitude Scale.

**Description of Tool:**

1. **Selected variables:** The selected variables include Gender, Age, Religion, Type of family, Educational status, Occupation, socio economic class, Number of children, Age at marriage, Married life, Have you ever heard about tubectomy and vasectomy, Source of information about tubectomy and vasectomy.

2. **Structured Knowledge Questionnaire:** This questionnaire was adopted to assess the level of knowledge of males and females toward tubectomy and vasectomy. It contains 20 multiple choice items regarding tubectomy and vasectomy covering the content area of:
   - Concept and types
   - Procedural knowledge
   - Assessment
   - Post care

   Each correct answer was graded with one point score and every incorrect answer was graded as no point. Consequently least score was 00 and greatest score was 20. The calculated Cronbach’s Alpha Internal consistency was 0.78 (Adequate range is 0.7-0.9).

3. **Structured Attitude Rating Scale:** This scale was used to measure the attitude of participants with regard to tubectomy and vasectomy. It consist of total 28 items used to measure the attitude of participants in terms of Strongly Agree, Agree, Uncertain, Disagree and Strongly Disagree and were graded from 1-5.

   Out of 28 items, 11 items were positive statements scored as 5,4,3,2,1 while 17 items were negative scored as 1,2,3,4,5.

   **Procedure:** In the wake of getting the formal regulatory endorsement, the last investigation was led in the period of April 2018 at chose villages of Rajpura, Punjab. Participants were selected by purposive sampling and information was gathered by utilizing tools of the study. A prior consent was taken from the participants. Earlier data was given to the subjects about the motivation behind the investigation.

**Data Analysis**

- **Descriptive statistics:** Frequency distribution was issued to show the selected variables.

  Correlation Coefficient test was utilized to find out the relationship between knowledge and attitude number score of Males & females towards tubectomy and vasectomy.

  Chi square Test was used to find out the Association of knowledge and attitude score of males and Females towards tubectomy and vasectomy with their selected variables.

**Results**

Frequency distribution in terms of level of knowledge score and Attitude scores of participants in
figure 1 and Figure 2 illustrates that furthermore half of the males 27(54%) had an moderate level of knowledge while 22(44%) of the males had low level of knowledge and only 1(2%) of male had high level of knowledge.

Out of the 50 females, Majority of them 30(60%) had average level of knowledge while 20(40%) had low level of knowledge as shown in figure 1.

**Figure 1: Percentage distribution in terms of level of knowledge among eligible couples towards tubectomy and vasectomy.**

Frequency and percentage distribution in terms of level of attitude of eligible couples towards tubectomy and vasectomy. Out of 50 males, Half of the males 25(50%) had moderately favourable attitude and 24(48%) of the males had favourable attitude while only 1(2%) of the males had unfavourable attitude towards tubectomy and vasectomy. Out of 50 females, majority of the females 35(70%) had moderately favourable attitude while only 15(30%) of the females had favourable attitude towards tubectomy and vasectomy as shown in figure 2.

**Figure 2: Percentage distribution in terms of level of attitude among males and females towards tubectomy and vasectomy.**
Table 1: Correlation between the knowledge and attitude of males and females towards tubectomy and vasectomy. N = 100

<table>
<thead>
<tr>
<th>Group</th>
<th>Knowledge score r(P value)</th>
<th>Attitude score R(P value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>---</td>
<td>0.10(0.23)</td>
</tr>
<tr>
<td>Females</td>
<td>---</td>
<td>0.66(0.06)</td>
</tr>
</tbody>
</table>

Relationship between the knowledge and attitude scores of participants towards tubectomy and vasectomy in table 5 which shows that r value of males and females were 0.10 and 0.66 respectively which were non significant at 0.05 level of significance calculated by Co-relational Co-efficient. So there was no relationship between knowledge and attitude of participants towards tubectomy and vasectomy as shown in table 2.

Chi square showing association between level of knowledge and attitude of males and females towards tubectomy and vasectomy. The findings reveals that computed p value of males and females with selected variables of knowledge and attitude found to be not significant at 0.05 level of significance. This shows there is no association between the level of knowledge and attitude of males and females towards tubectomy and vasectomy as shown in table 3.

Table 2: Chi square showing association in terms of level of knowledge and attitude of males and females towards tubectomy and vadectomy. N=100

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Variables</th>
<th>Males</th>
<th>Females</th>
<th>Chi square (x²)</th>
<th>Df</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Knowledge</td>
<td></td>
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<td></td>
<td>Good</td>
<td>1</td>
<td>0</td>
<td>1.25</td>
<td>2</td>
<td>0.53NS</td>
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<tr>
<td></td>
<td>Average</td>
<td>27</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poor</td>
<td>22</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Favourable</td>
<td>24</td>
<td>15</td>
<td>4.74</td>
<td>2</td>
<td>0.09NS</td>
</tr>
<tr>
<td></td>
<td>Moderately favourable</td>
<td>25</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unfavourable</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NS = Not Significant (p>0.05)

Discussion

In this study, From 50 males 22(44%) of the male’s knowledge was low while more than half of the males knowledge was average i.e. 27(64%) and only 1(2%) of male had high level of knowledge. Out of 50 females, 20(40%) of the females had low level of knowledge while more than half of the females 30(60%) had average level of knowledge and 0(0%) female had high level of knowledge.

In the present study, 24(48%) of the males had favourable attitude and half of the males 25(50%) had moderately favourable attitude while only 1(2%) of the males had unfavourable attitude. Out of 50 females, less than half of the females 15(30%) had favourable attitude and more than half of the females 35(70%) had moderately favourable attitude and no females had unfavourable attitude. These results were contradictory to the study conducted by Onasoga, 2013. The result showed that respondent’s knowledge of atleast one type of male family planning method, only 18(13.2%) had higher knowledge level and rest of the participants 33(24.3%) had lower knowledge regarding vasectomy. Most of the respondent also showed negative attitude towards vasectomy.

The mean knowledge score of males was 7.76+2.33 with obtained range of 2-13 and the mean knowledge score with standard deviation of females was also 7.76+2.33; median was 8 with obtained range of 2-13 whereas the mean attitude score of males was 96.26+12.71; median was 96.50 with obtained range of 73-125 and the mean attitude score of females was 97.6+ 12.49; median was 97.50 with obtained range of
These findings were contradictory to the results of the study by Gayathry, D., 2014 who observed that females had higher scores as compared to males which was not significant between the overall knowledge score (18.67+7.798 vs. 18.41+7.177)6.

In the present study, the computed p values of knowledge scores of the males with their selected variables were not significant except education i.e p-value 0.02 and occupation i.e p-value 0.01 which were highly significant. Hence knowledge of males towards tubectomy and vasectomy was dependent on educational status and occupation.

In this study, the computed p values of attitude scores of males with their demographic variables were non significant except Educational status i.e p value 0.00, occupation i.e p value 0.02, No. of children i.e p value 0.05, age at marriage i.e p value 0.03 which were highly significant at the 0.05 level of significance and computed p-value of females with all demographic variables were non significant at 0.05 level of significance. The findings are partially matches with the study conducted by Onasoga, 2013. The findings reveals that there was no significant association of academic scores of respondents and their attitude towards vasectomy, as well as between marital status and their attitude towards vasectomy significant association was found between the level of knowledge and attitude towards vasectomy5.

In the present study, computed p value of males and females with selected variables of knowledge and attitude was non significant at 0.05 level of significance. This shows there is no association between the level of knowledge and attitude of males and females towards tubectomy and vasectomy.

**Ethical Approval:** The moral leeway was gotten by taking consent from Sarpanch of Respective villages to direct the investigation in the rustic zones. The assent from the qualified Couples was gathered preceding the examination. The reason for doing research venture was clarified and affirmation of privacy was given to the members.

**Conflict of Interest:** Nil

**Financing Sources:** Nil

**References**

Health Care Professionals’ Pain in Pandemic COVID 19 in India

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Abstract

Health care professionals are highly vulnerable for COVID 19 infection. It is due to frequent contact with COVID 19 positive patients, long time exposure with positive patients. There may be lack of personnel protective equipment’s (PPE). Indian health care professional taking many kinds of pain during the management of COVID 19 it can be hospital related problems during management, professional must wear PPE about 06 hours on duty time. Duty time with PPE personnel uncomforted and cannot have anything even water. PPE cannot change frequently. Socially persons do not comfort because society not accepting as normal people, they afraid of spreading of corona by health care personnel. Family isolation also necessary for the health care professional to avoid infection to their family members during COVID 19 management. Health professionals have tough time to manage pandemic. Government also active and full swing supporting providing extra care of health professionals, giving insurance and approved extra budget to fight with COVID 19.

Keywords: COVID 19, PPE, Pandemic, Isolation.

Introduction

Whole world fighting with pandemic COVID 19, this word given by WHO in January 2020, COVID 19 indicate corona virus disease 2019, (COVID-19) was outbreak from Wuhan, China January 2020.¹ on 30 January 2020 WHO declared outbreak of this disease and declare as Public Health Emergency globally.² In India 1st case of corona virus detected on 30th January 2020³ and fist case of COVID 19 reported in December 2019 from Wuhan city from china. Total cases in India till date 08 April 2020 for COVID 19 is 4714 Active Cases, 410 Cured/Discharged, 149 Deaths 1 Migrated.⁴ Indian health professional including doctors and paramedical staff providing the health care services in all over the India. in India all places not the protective measure available and in some higher institute protective equipment’s not in sufficient amount,⁵ we using these protective equipment cautionary as per the direction and availability of PPE . it should try make at local level by and low price, can make by raincoat/wind chitter material can be used. Scientific and technical approval can be taken. It should be in 3 layers, 1st layer -made up of material like wind cheater, 2nd layer- Absorbent like foam, so that if any respiratory droplets passes through 1st layer it gets absorbed in it, 3rd layer-again of the same material like the 1st layer Hydrophobic: non porous: non-absorbent. Devolved country also facing PPE kit shortage problem and India is developing country. Till 03 April in India about 50 health professionals affected by COVID 19.⁶ This insist to think about the future of our health professional COVID 19 case increasing day by day in this COVID outbreak, if health professional become sick who will treat the COVID cases. Frequently screening for the corona of health professional is suggested, by

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Family related problems originated with the health care professional who are treating the COVID 19 patients. He avoids living with their family members because there are chances of spread of infection to their kin near and dear. That is health care professionals are worried about their family members and relatives. As we know that everyone has their family included kids to old members. study in china reported that it affects the all age group, 4 % affected less than 17 years aged peoples,12 % cases seen in more than 65 years age rest 84 %cases reported in middle aged 18 to 64 years age group population. in respect of family value, Two infected Italian nurses also committed suicide due fear of spreading of infection to the others.

Society related problems also came to notice in the Indian society, the health care workers ruined by the peoples, disgraceful behaviour with health care providers. Some part of India reported that when health workers went into the society for the screening of COVID 19 cases. They started fighting with them and there was mob attack over the few health care providers. They save yourself by run away, that’s life-threatening situation for the health care providers. health care professional residing at their home, those area public doing bad behaviour they are saying to health providers confined at your home do not move. Groceries shop keeper not supporting the health care providers not giving groceries to them and saying go away. you are more vulnerable to spread infection to us. Many health professionals are renters and their land lard insisting to vacate the house. They be afraid of that health professional can spread the COVID19 to others nearby.

Government giving full support to health care provider, who are indulging in management of COVID 19 cases as much as possible. In respect of this pandemic to fight with the situation, government given separate budget that’s one lakh seventy thousand crores. Other country also allocated separate budget to fight with COVID 19 tragedy, US allocation is two trillion US dollar to fight this pandemic. In Indiagovt also approved insurance for health care providers to encourage the moral and family support. It will provide an insurance cover of Rs. 50 lakhs for ninety (90) days to a total of around 22.12 lakh public healthcare providers, including community health workers, who may have to be in direct contact and care of COVID-19 patients and who may be at risk of being impacted by this. It will also include accidental loss of life on account of contracting COVID-19.
WHO considers ‘airborne precautions’ for medical staff after study shows coronavirus can survive in air.\(^2\)\(^3\)
Management of the corpse with suspect, probable or confirmed COVID-19 respiratory infection – Italian interim recommendations for personnel potentially exposed to material from corpses, including body fluids, in morgue structures and during autopsy practice.\(^2\)\(^4\)
Any post-mortem activities, from recovery, transport, to autopsies and handover to families and burial, should be therefore conducted with a focus on avoiding aerosol generating procedures, such as splashes of contaminated fluids;\(^2\)\(^5\)
Forensic pathologists beware: COVID-19 lives on in blood after death.

**Conclusion**

Indian Health care professionals are in awfully bad and painful condition; beside that they are serving the nation and they are providing hope to live to the COVID 19 patients. Indian government also supporting as much as possible by all the way to fight with corona dragon. Health care professional fighting everywhere in hospital,society as well as their home with family and relatives.

**Conflict of Interest:** None declared

**Source of Funding:** None

**Ethical Clearance:** Not required (Review literature).

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A Retrospective Study of Medico-legal Cases Coming to a Tertiary Care Hospital of Malwa Region of Punjab

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¹Associate Professor, ²Professor and Head, Department of Forensic Medicine and Toxicology, Guru Gobind Singh Medical College & Hospital, Faridkot, Punjab

Abstract

Background: Number of person suffering from some kind of illness is increasing day by day. In addition to the individuals suffering from various disease, person with medico-legal injuries or complaints are also admitted in the hospital. A hospital is a place where a patient gets required treatment, undergoes various investigations, procedures and medico-legal formalities when required. In a tertiary care hospital, Emergency Medical Officer is the first doctor to attend the patient. In any case first and foremost duty of a doctor is to save the life of patient. After providing the first aid and following the treatment protocol another duty is to do all medico-legal formalities like issuing Medico-legal reports and sending police information etc in a police case. A medico-legal case is a case where a patient has some assault injuries or having some complaint where a doctor thinks that some kind of information to police is required in the case.

Aims and Objectives: To prepare and evaluate complete demographic profile of medico-legal cases admitted at our tertiary care hospital.

Materials and Method: A one and half year retrospective study was conducted in department of Forensic Medicine at G.G.S. Medical College, Faridkot. This study was conducted on cases that came during the period under study i.e. from 1st January 2017 to 30th June 2018.

Results: A total of 1850 medico-legal cases got registered in the emergency during the period under study. Out of these, medico-legal reports were prepared in 1510 cases. Majority of cases in which MLR was issued were of assault followed by road traffic accident. Males dominated the females and commonest age group affected was 21-30 years in our study. Majority of victims got admitted in Surgery department followed by Orthopedics and Neurosurgery department. Most victims came during period from 8PM to 8AM. Maximum number of cases reported in months of summers than winters. Most of the victims were of rural background.

Keywords: Medico-legal case, Casualty, Tertiary Care, Assault.

Introduction

A doctor working in a government hospital or even in a private hospital has to perform duties which can be medical, surgical or medico-legal etc. A tertiary care hospital is a hospital that provides tertiary care, which is health care from specialists in a large hospital after referral from primary care and secondary care. A medico-legal case is a case of injury or having some complaint where a doctor after taking history and clinical examination of the patient thinks that some investigations by law enforcing agencies are essential so as to fix responsibility regarding the case.¹ It is classified as cases related to the crime against the human body like assaults, rape, burns, poisoning etc. Injury is defined under section 44 IPC as “any harm whatever illegally
caused to any person, in body, mind, reputation or property”. Profiling of Medico legal cases is an integral aspect for the prevention of preventable causalities in future and to study the crime rate in area.

Materials and Methodology
A one and half year retrospective study was conducted in department of Forensic Medicine and Toxicology at G.G.S. Medical College, Faridkot. This study was conducted on cases that came during the period under study i.e. from 1st January 2017 to 30th June 2018. Information regarding the date, time and place of the incident, age, gender and place of residence of the victims, time of admission etc was gathered from the available records. The relevant details were analyzed and tabulated by taking various parameters like age, sex, time of admission, cause of MLC etc. for obtaining observations.

Inclusion Criteria: This study included only those cases for which Medico-legal report was issued either on arrival or on request later on.

Exclusion Criteria: Those cases in which Medico-legal report was not issued or those went LAMA/referred to other hospitals were excluded from the study. Cases in which consent was not given or in which MLR was deferred due to unconsciousness or serious condition of victim were also excluded from our study.

Observations: A total of 1850 medico-legal cases got registered in the emergency during the period under study. Out of these, medico-legal reports were prepared in 1510 cases. Majority of cases in which MLR was issued were of assault followed by road traffic accident. (Table 1).

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assault</td>
<td>1035</td>
<td>68.5</td>
</tr>
<tr>
<td>Road side Accident</td>
<td>325</td>
<td>21.5</td>
</tr>
<tr>
<td>Sexual Assault</td>
<td>50</td>
<td>03.3</td>
</tr>
<tr>
<td>Others</td>
<td>100</td>
<td>06.7</td>
</tr>
</tbody>
</table>

In our study Males dominated the females. The overall male to female ratio of the cases was 2.8:1. The commonest age group affected was 21-30 years for both male and female victims followed by 31-40 age groups. (Table 2).

<table>
<thead>
<tr>
<th>Age (in years)</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%age</td>
<td>Number</td>
</tr>
<tr>
<td>00-10</td>
<td>025</td>
<td>2.3</td>
<td>10</td>
</tr>
<tr>
<td>11-20</td>
<td>130</td>
<td>11.7</td>
<td>55</td>
</tr>
<tr>
<td>21-30</td>
<td>430</td>
<td>38.7</td>
<td>124</td>
</tr>
<tr>
<td>31-40</td>
<td>185</td>
<td>16.7</td>
<td>74</td>
</tr>
<tr>
<td>41-50</td>
<td>170</td>
<td>15.3</td>
<td>67</td>
</tr>
<tr>
<td>&gt;50</td>
<td>170</td>
<td>15.3</td>
<td>70</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1110</strong></td>
<td><strong>100</strong></td>
<td><strong>400</strong></td>
</tr>
</tbody>
</table>

Most of the victims were of rural background. Most of the male victims were of rural background. The overall male ratio of rural to urban area was 1.7:1. Majority of female victims also belong to rural background. The overall female ratio being 1.5:1. (Table 3).
Table 3: Rural/Urban background

<table>
<thead>
<tr>
<th>Background</th>
<th>Male</th>
<th></th>
<th>Female</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Rural</td>
<td>700</td>
<td>63</td>
<td>215</td>
<td>53.8</td>
<td>915</td>
<td>60.6</td>
</tr>
<tr>
<td>Urban</td>
<td>410</td>
<td>37</td>
<td>185</td>
<td>46.2</td>
<td>595</td>
<td>39.4</td>
</tr>
<tr>
<td>Total</td>
<td>1110</td>
<td>100</td>
<td>400</td>
<td>100</td>
<td>1510</td>
<td>100</td>
</tr>
</tbody>
</table>

Majority of victims came during period from 8PM to 8 AM. (Table 4).

Table 4: Time of Arrival

<table>
<thead>
<tr>
<th>Time</th>
<th>No. of Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 AM to 02 PM</td>
<td>400</td>
<td>26.4</td>
</tr>
<tr>
<td>02 PM to 08 PM</td>
<td>495</td>
<td>32.8</td>
</tr>
<tr>
<td>08 PM to 08 AM</td>
<td>615</td>
<td>40.8</td>
</tr>
</tbody>
</table>

Majority of victims were admitted in Surgery department followed by Orthopedics and Neurosurgery department. (Table 5).

Table 5: Admitted in Department

<table>
<thead>
<tr>
<th>Name of Department</th>
<th>No. of Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery</td>
<td>575</td>
<td>38</td>
</tr>
<tr>
<td>Orthopedics</td>
<td>475</td>
<td>31</td>
</tr>
<tr>
<td>Neurosurgery</td>
<td>360</td>
<td>24</td>
</tr>
<tr>
<td>Others</td>
<td>100</td>
<td>07</td>
</tr>
</tbody>
</table>

Maximum number of cases reported in summer months than winters. (Table 6).

Table 6: Month Wise Distribution

<table>
<thead>
<tr>
<th>Name of Month</th>
<th>Number of Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>January-March</td>
<td>120</td>
<td>08</td>
</tr>
<tr>
<td>April-June</td>
<td>590</td>
<td>39</td>
</tr>
<tr>
<td>July-September</td>
<td>750</td>
<td>49</td>
</tr>
<tr>
<td>October-December</td>
<td>050</td>
<td>04</td>
</tr>
</tbody>
</table>

Discussion

In the present Study Medico-Legal reports were issued in 1510 cases. It was observed that most of the cases were of Assaults followed by Road Side Accident (RSA). This may be due to the reason that assault victims are keener for Medico-legal reporting than the RSA cases. Garg Vishal etal reported in his study that RTA was highest. SN Hussainietal reported that Burns constituted majority of MLC. Majority of cases belong to age group of 21-30 years, being the most active phase of life. This age group is more prone to go for outdoor activities and more prone for assault and accidents. Another reason for RSA is proximity of National highway to our college. Same was also reported by SN Hussainietal. In our study it was observed that majority of the victims (40.8%) reported to casualty in the evening to night period followed by afternoon period as people becomes more prone to assault and accidents due to more recreational activities and parties during that period. Garg Vishal etal reported that the majority of the incidences occur between 1601 to 2000 hours (33.5%)
followed by 1201 to 1600 hours (20.9%) and 2001 to 2400 hours (19.4%). Maximum cases were admitted in the month of July to September (49%) followed by months of April to June (39%). Garg Vishal et al reported in his study that maximum cases 92 (11.7%) were admitted in the month of September and 252 (32.1%) cases during July to September (monsoons). Present study shows maximum number of victim were males (73%) as compared to females (27%) as they are more active member of a family and still the main bread earners of the family as also reported by other various authors.5-11

Conclusion

The casualty department of any hospital not only gives treatment to the patients who reports in emergencies but also carry out legal responsibilities to examine and conduct medico legal cases which in turn puts a lot of burden on the concerned department. The basic principles of preventing injury are education, Law enforcement, pre-hospital care and the evaluation. The doctors who are involved in treatment of such medico-legal cases need to be more trained and skilled in this field. Also due to increase in accidents and violence cases, hospitals have the need for round the clock availability of such medico-legal experts in sufficient number to deal effectively with such cases to better serve judicial purpose.

Ethical Clearance: Taken from Institutional Ethics Committee.

Source of Funding: Nil

Conflict of Interest: Nil

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The Effect of Health Officer Role to the Program of Stunting Prevention on First 1000 Days of Life in Indonesia

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Abstract

A role of health officer to prevent stunting rate was very significant, especially on first 1000 days of life. The role of health officer within program of stunting prevention was divided into three parts: basic role, the role on specific nutritional intervention, since the role on nutritional intervention was regarded as sensitive aspect. This research aimed to analyze the effect of implementation from health officer to the program of stunting prevention on the first 1000 days of life. This research was categorized into quantitative research which exerted case control approach, while the data analysis employed bivariate data analysis with logistic regression analysis test. The research sample was taken through cluster random sampling in approximately 275 respondents. The result of data analysis showed the effect of health officer basic role to the stunting prevention. Moreover, the analysis result from those three variables indicated p value ≤ 0.05, it referred that this variable did not get to be confounding factor in this research and it referred that the significant effect was not existed between health officer role and stunting prevention program on the first 1000 days of life in Indonesia. This result demonstrated that the variable of specific nutrition intervention became the most effective aspect to the program of stunting prevention on the first 1000 day of life, it produced OR value 0.703 (95% CI: 0.504-0.981). Therefore, the good specific nutrition intervention has the biggest chance as much as 0.703 times in order to prevent stunting rather than the poor specific nutrition intervention.

Keywords: Role of Health Officer, Stunting, Basic Role of Health Officer, Specific Nutritional intervention, Sensitive Nutritional intervention.

Introduction

The incident of stunting is recently the main problem which attacks to the toddlers in almost all parts of world. The impact which is caused by stunting incident was very vital, it not only affects to the toddler health, but is also potential to hamper the national development and advancement in the future. The bad impacts which are caused by the problem of stunting in short term: disruption of brain development, intelligence, physical growth disorder, and metabolism disorder in the toddler body. Whilst, the bad impacts in long term period from this stunting problem are decline of cognitive skill and learning achievement, decline of immune which causes to the client to easily ill, and the high risk will rise to diabetes, obesity, heart disease and vascular disease, cancer, stroke, and disability on the old age, as well as uncompetitive working quality which results to the low economic productivity. The huge of loss in case of stunting is due to the rise of government expenditure, specifically on the national health insurance⁶.

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role of health officer as an attempt to realize maximal service in the first stage/primary service on a particular program is very important, since it is considered as a key of health development in Indonesia, thus, the health officer must have duties and responsibilities to run Minimal Service Standard of health sector in order to realize the healthy society in all society and affordable cost efficiency\(^1\). The prevention on stunting incident is focused on the role of health officer as it has been mentioned in the Laws, where the government has also implemented some policies and programs which are nationally executed by the Indonesian Government to the stunting incident. The health development during period of 2015-2019 has been focused on four priority programs, as decrease of death rate on mother and baby, decrease of stunting prevalence, management on transmittable disease and un-transmittable disease. The attempt to rise public nutrition status includes to stunting prevalence is regarded as a priority program of national development which is asserted in the main target of National Development Plans in Medium-term 2015-2019. The target of decrease on stunting prevalence (either short or very short toddler) in below age of 2 years old is 28\%\(^7\).

**Method**

This research was categorized into a quantitative research which employed analytic descriptive research method. This research exerted cluster random sampling as the data collection method. The total research sample were 257 respondents from 13 posyandu. The method of data analysis in this research was univariate analysis by exerting descriptive method, frequency table, while bivariate analysis by exerting logistic regression, which aimed to identify the effect of health officer role to the prevention of stunting. Moreover, the descriptive analysis of this research was employed to illustrate generally about the respondent characteristics who had babies in age of 0-23 months. Meanwhile, the logistic regression analysis was employed to test the effect of independent variable to the prevention of stunting incident.

**Research Findings:** The respondent characteristic in this research could be categorized into a number of groups: mother’s education, mother’s occupation, mother’s income, and child gender. The detail distribution of respondent characteristic in approximately 275 respondents could be seen on the table 1 below:

<table>
<thead>
<tr>
<th>Table 1. Distribution of respondent characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respondent Characteristic</strong></td>
</tr>
<tr>
<td>--------------------------------</td>
</tr>
<tr>
<td><strong>Educational Background of Mother</strong></td>
</tr>
<tr>
<td>Unfinished of Elementary School Degree</td>
</tr>
<tr>
<td>Elementary School</td>
</tr>
<tr>
<td>Junior High School</td>
</tr>
<tr>
<td>Senior High School</td>
</tr>
<tr>
<td>University</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td><strong>Occupation of Mother</strong></td>
</tr>
<tr>
<td>Employed</td>
</tr>
<tr>
<td>Unemployed</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td><strong>Child Gender</strong></td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Based on the table 1, this research finding indicated that the majority of respondents were graduation of Senior High School Degree 80 respondents (29\%), employed category 159 respondents (57\%), having income more than UMK standard 179 respondents (65\%), and child of female gender 146 respondents (53\%).

**Cross Tabulation on role of health officer and stunting on Toddlers.** The total of respondents in 13 posyandu were 275 respondents. The result of this cross tabulation was to determine five evaluation categories, this was acquired from accumulation of all questionnaires from each indicator in a variable of basic role, and the result of cross tabulation on basic role effect of health officer to the program of stunting prevention could be seen on the table 2 below:
Table 2. Frequency distribution which was based on the role of health officer

<table>
<thead>
<tr>
<th>No</th>
<th>Category</th>
<th>Basic Role</th>
<th>Specific Nutritional intervention</th>
<th>Sensitive Nutritional intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>1.</td>
<td>Very Good</td>
<td>3 1.1</td>
<td>0 0</td>
<td>13 4.7</td>
</tr>
<tr>
<td>2.</td>
<td>Good</td>
<td>142 51.6</td>
<td>122 44.4</td>
<td>137 49.8</td>
</tr>
<tr>
<td>3.</td>
<td>Quite Good</td>
<td>62 22.5</td>
<td>85 30.9</td>
<td>86 31.3</td>
</tr>
<tr>
<td>4.</td>
<td>Not Good</td>
<td>68 24.7</td>
<td>68 24.7</td>
<td>39 14.2</td>
</tr>
<tr>
<td>5.</td>
<td>Not Very Good</td>
<td>0 0</td>
<td>0 0</td>
<td>0 0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>275 100</td>
<td>275 100</td>
<td>275 100</td>
</tr>
</tbody>
</table>

Based on the table 2, this research finding referred that the basic role of Health Human Resource in the attempt of stunting prevention was mainly good in approximately 142 (51.6%). The indicators which were used to arrange the basic role of Health Human Resource: communicator, motivator, facilitator, counselor. The role of specific nutritional intervention as an attempt to prevent stunting was mostly good in approximately 122 (44.4%). The indicators which were used to establish the role of specific nutritional intervention: Pregnancy record of mother which was influenced by the role of health officer and the role of health officer intervention on the toddler in age range 0-23 months. The role of sensitive nutritional intervention as an attempt to prevent stunting incident was mainly good in approximately 137 (49.8%). The indicators which were used to arrange the role of sensitive nutritional intervention covered to the role of clean water provision and sanitation, program of Keluarga Berencana, health insurance, basic childbirth assurance, and nutrient education.

The result of conformity model test from analysis of health officer role effect to the stunting prevention program on the first 1000 days was shown on the table 3 below:

Table 3. Analysis between independent variables and stunting

<table>
<thead>
<tr>
<th>Variable</th>
<th>P value</th>
<th>Exp (B)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>Basic role of Health Human Resource</td>
<td>0.000</td>
<td>0.431</td>
<td>0.305</td>
</tr>
<tr>
<td>Specific nutritional intervention</td>
<td>0.038</td>
<td>0.703</td>
<td>0.504</td>
</tr>
<tr>
<td>Sensitive nutritional intervention</td>
<td>0.002</td>
<td>0.575</td>
<td>0.402</td>
</tr>
</tbody>
</table>

The table 3 illustrated the analysis result from those three variables which showed p-value > 0,05, which referred that the variable was not a confounding factor in this research. Besides, this result indicated that the variable of specific nutritional intervention was a factor with the greatest risk which was related to the stunting incident prevention, since it delivered to the biggest Odds Ratio value 0.703 (95% CI: 0.504-0.981). Thus, the respondents who have received good specific nutritional intervention would have more chance 0.703 times to prevent stunting incident, if it was compared to the bad specific nutritional intervention.

Discussion

The basic role was covered to the role as communicator, facilitator, counselor, and also motivator. The basic role of health officer in stunting prevention was in line with this following theory, where the role as a communicator must be owned by all health officers. The health officer as a communicator must be able to deliver information, educate and teach individual, family, group and society, and other health officers according to their responsibilities(1). Further, the health officer as an educator must educate or conduct health counseling
to the clients and was completed by an evaluation which aimed to develop health learning\(^{(18)}\). The role of health officer as a motivator was also important as other roles. The health officer must be able to give motivation, direction, guidance, and increase awareness on the client\(^{(5)}\). The characteristics of health officer as a motivator were to provide assistance, bring client awareness, and encourage group to recognize potential and problem, and be able to develop the potential in order to solve the problem\(^{(7)}\). The role of facilitator must be also owned by every health officer within health promotion. As a facilitator, the health officer must be able to give technical guidance and empower the client to develop to the expected goal achievement. The facilitator must be skilful to integrated three important aspects, as optimization of facilities, time provision, and optimization of society participation\(^{(2)}\). The role of health officer as a counselor in aspect of health socialization or promotion was very needed, the health officer must be able to give approaches and trainings to the local public figure, help client to understand information take decision relating to the medical treatment, and facilitate the client and family as well as all society to improve optimal health situation\(^{(13)}\).

The role of health officer as an attempt of specific nutrition intervention was the direct role or involvement which given on 0-23 months\(^{(6)}\). It was indicated the effect of food intake which covered to energy intake protein intake, fat intake, carbohydrate intake, calcium intake, zinc intake to the stunting incident on toddler in the age range 6-35 months \(^{(8)}\). The toddler age should be introduced to many kinds of food, it was not only to give education relating to kind of food, but also to fulfill the nutritional need in order to help the process of growth\(^{(10)}\). The toddler who received non-exclusive breast milk have risk of stunting 16.5 greater than the toddler who received exclusive breast milk\(^{(6)}\). The role of Health Officer to give education which related to smoking habit was also crucial, it was in line with the theory from the center of social insurance of University of Indonesia, where the research finding had showed that the cigarette consumption on parent would affect to stunting children\(^{(10)}\). The smoking behavior on parent was estimated to influence the stunting children through two ways. First, through the cigarette smoke which was able to disturb nutrient absorption on children, second, aspect of cigarette buying cost which would affect the parent to reduce the nutritious food cost, health cost, education cost, etc\(^{(12)}\).

The role of health officer as an attempt of sensitive nutrition intervention was done by multi-sector. Furthermore, the role of health officer as an attempt of sensitive nutrition intervention has shown a good role result. The effect of health officer role on sensitive nutritional intervention to the stunting prevention program in the first 1000 days of life was an attempt to prevent and decrease nutritional problems indirectly\(^{(6)}\). Many studied have analyzed the access relation between clean water and stunting incident. Besides malnutrition, the bad water condition and sanitation would also affect to the high rate of stunting incident on children in Indonesia. The ground floor and sanitation could improve the stunting incident, since the children who lived in the house with ground floor and bad sanitation were tended to suffer illness, this condition was a leading factor of stunting\(^{(11)}\). The role of health officer was directed to prevention attempt, because the sanitation and clean water was regarded as a cross sectoral activity which involved the other role of housing ministry and irrigation sector in general \(^{(15)}\). The effect of Keluarga Berencana program was aimed to prevent stunting incident and was considered as an attempt of government in the stunting prevention program through National Population and Family Planning Board (BKKBN) \(^{(19)}\). The woman who have good access to the health service was who have received information regarding to that service from health officer as doctor, midwife, or nurse. For the society in low level of economic status, the cost limitation was often the biggest factor which hampered the woman access to the health service, especially the safe childbirth\(^{(14)}\). The effect of health officer role to the nutritional improvement of society has been employed in multisectoral, through socialization from the government and non-government regarding to the importance of nutritional intake on pregnant mother\(^{(17)}\).

**Conclusion**

Prevalence of stunting which was based on this research, indicated that the number was still high in approximately 36.7\%, it was valued as high level according to WHO standard, since it was above 20\%. The effect between basic role of Health Officer, the effect of Health Officer role, the effect of Health Officer role and stunting incident.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** This research has undergone
ethical test in ethics commission of health research of Faculty of Dentistry, University of Jember in this following registration number 632/UN25.8/KEPK/DL/2019.

References


Epidemiological Study of Female Death within Seven Years of their Marriage in Kanpur Region

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Abstract

Introduction: When girls get married, this heralds a major change in their immediate environment. There is a change of guardianship, separation from the parents and family and creation of a new family. All this creates a stressful environment around them, which is further aggravated by pregnancy, the upbringing of children, managing the household and office works. Eventually, when the tolerance breaks down, the brides are forced to take the extreme step of ending their miserable lives. In the majority of female unnatural deaths, the family members (parents, husbands, in-laws) may be directly or indirectly responsible for precipitating the circumstances leading to the death of the victim.

Methodology: Material for the present study comprised of all information from the relatives, guardians, police or investigating officers pertaining to the cases of ‘unnatural deaths of females within seven years of their marriage’, brought to the District Mortuary, Kanpur during the period of one year.

Conclusion: The incidence of unnatural deaths in females who died within seven years of their marriage was estimated to be 4.17% of the total cases autopsied. Maximum numbers of victims were rural Hindu housewives belonging to lower-middle or middle socioeconomic classes between 18-22 years of age and most of them had died within three years of their marriage. In cases of homicidal deaths burning and throttling/strangulation were found as the most common method used Dowry was the most common motive in homicidal deaths. As such husbands and in-laws were the most common human offenders in homicidal cases. Hanging was the most common method used in suicidal cases followed by burning. Whereas family quarrel and marital disharmony were the most common motives behind such deaths.

Keywords: Married female death within 7 years of marriage, dowry death, burning death, hanging, suicide in married female, homicide in married female.

Introduction

The rapid increase of unnatural deaths in newly married females in our population probably because of problems related to marriages, mal-adjustment and marital disharmony between the newly married women & the family of in-laws has caused great concern to our masses in last few decades. When girls get married, this heralds a major change in their immediate environment. There is a change of guardianship, separation from the parents and family and the creation of a new family. All this creates a stressful environment around them, which is further aggravated by pregnancy, the upbringing of children, managing the household and office works. Eventually, when the tolerance breaks down, the brides are forced to take the extreme step of ending their miserable lives. In the majority of female unnatural
deaths, the family members (parents, husbands, in-laws) may be directly or indirectly responsible for precipitating the circumstances leading to the death of the victim.

**Material and Method**

**Material:** Material for the present study comprised all the cases of ‘unnatural deaths of females within seven years of their marriage’, brought to the District Mortuary, Kanpur, during the period of one year from January 2017 to December 2017, that numbering 152 (One Hundred Fifty Two) cases. Information was gathered from their relatives, guardians, neighbors, investigating police officers after having informed and explained about our research and taken consent from the guardian.

**Exclusion Criteria:**

1. Unidentified bodies, where the relevant history was not ascertainable.
2. Cases in which, autopsy established a natural cause of death.
3. Cases of deaths, which occurred in mass casualties, like train accidents, major road accidents, explosions etc.
4. Cases of death, which occurred in road traffic accidents, even if not the case of mass casualty.
5. Cases of deaths, where the duration of marriage was found by history and interrogation, to be more than seven years.

**Observation and Results**

Present work is done to explore the epidemiology of deaths in married females, died within seven years of their marriage. The study is done from the cases of unnatural deaths, in such females, brought to District Mortuary of Kanpur, during the year 2017. Total number of cases autopsied were 3643, from January 2017 to December 2017. 152 cases were found of married females, who died within seven years of their marriage. The most of the victims were rural Hindu housewives. The observations thus recorded are tabulated after analyzing the collected data.

**Table 1. Age Distribution**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>No. of Cases</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-20</td>
<td>36</td>
<td>23.68</td>
</tr>
<tr>
<td>21-22</td>
<td>50</td>
<td>32.89</td>
</tr>
<tr>
<td>23-24</td>
<td>19</td>
<td>12.50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>152</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Maximum number of victims were in the age group of 21-22 years, followed by the age group of 18-20 years (Table-1). This means that most of the victims were of very young age, died in the beginning years of their married lives. Because of the trend of early marriage in India and probably because the person becomes mature enough, no cases of unnatural deaths was found in more than 30 years age group, having completed less than seven years of marriage.

**Table 2. Socio Economic Status**

<table>
<thead>
<tr>
<th>Socio Economic Class</th>
<th>No. of Cases</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower (Class V)</td>
<td>10</td>
<td>6.57</td>
</tr>
<tr>
<td>Lower Middle (Class IV)</td>
<td>81</td>
<td>53.28</td>
</tr>
<tr>
<td>Middle (Class Iii)</td>
<td>55</td>
<td>36.18</td>
</tr>
<tr>
<td>Upper Middle (Class II)</td>
<td>6</td>
<td>3.94</td>
</tr>
<tr>
<td>Upper (Class I)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>152</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Most of the victims i.e. 53.28%, belonged to class IV (lower middle class) of the socio-economic classification followed by middle class i.e. 36.18%. Not a single case was found from the upper class (class -1) (Table-4).

**Table 3. Educational Status of victims**

<table>
<thead>
<tr>
<th>Education Status</th>
<th>No. of Cases</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illiterate</td>
<td>38</td>
<td>25.00</td>
</tr>
<tr>
<td>Primary</td>
<td>54</td>
<td>35.52</td>
</tr>
<tr>
<td>Junior High School</td>
<td>13</td>
<td>8.55</td>
</tr>
<tr>
<td>High School</td>
<td>33</td>
<td>21.71</td>
</tr>
<tr>
<td>Interediate</td>
<td>7</td>
<td>4.60</td>
</tr>
<tr>
<td>Graduate</td>
<td>6</td>
<td>3.94</td>
</tr>
<tr>
<td>Post Graduate</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tech. Professional</td>
<td>1</td>
<td>0.65</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>152</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Low educational status has been found to be an important factor influencing such deaths (Table-6) as 60% of victims has no education or only primary level education.
It shows personal habits of the victims, as most of the victims belong to Hindu community, so is seen by their dietary pattern that most of them are vegetarian (80.92%). 19.07% cases were non-vegetarian either regular or occasional. Although such kind of dietary pattern is nothing to do with deaths, but it shows that most of the cases are occurring in Hindu families. 5 victims (3.28%) were regular smokers, while 15 of them (9.86%) were habitual of tobacco chewing. None of the victim was either alcoholic or drug addict. Personal habits reflect the mental status of the person. Most of the women were mentally normal (88.81%). Unstable personality and neurotic status were found in 3.28% and 2.63% cases respectively. 3 cases (1.97%) each, were found of hysterical behaviours and depressed mental condition. None of the females were drug addicted or had any other mental problem.

Table 4. Method used

<table>
<thead>
<tr>
<th>Method</th>
<th>No. of Cases</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burning</td>
<td>67</td>
<td>44.07</td>
</tr>
<tr>
<td>Hanging</td>
<td>46</td>
<td>30.26</td>
</tr>
<tr>
<td>Poisoning</td>
<td>14</td>
<td>9.21</td>
</tr>
<tr>
<td>Throttling/Strangulation</td>
<td>16</td>
<td>10.52</td>
</tr>
<tr>
<td>Drowning</td>
<td>2</td>
<td>1.31</td>
</tr>
<tr>
<td>Others</td>
<td>7</td>
<td>4.60</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 5. Place of Death

<table>
<thead>
<tr>
<th>Place of Death</th>
<th>No.of Cases</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Husband’s House</td>
<td>10</td>
<td>6.57</td>
</tr>
<tr>
<td>Parental House</td>
<td>10</td>
<td>6.57</td>
</tr>
<tr>
<td>In Laws house</td>
<td>63</td>
<td>41.44</td>
</tr>
<tr>
<td>Hospital</td>
<td>65</td>
<td>42.76</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td>2.63</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>100</td>
</tr>
</tbody>
</table>

While deaths of the most of victims (42.76%) happened in hospital (Table 5) followed very closely by deaths in in-laws’ house (41.44%). Deaths in husband’s house and parental house were found in 10 cases (7.57%) each. In 4 cases (2.63%) deaths happened at other places including railway tracks and on the way to the hospital.

Table 6. Period of Survival after incident

<table>
<thead>
<tr>
<th>Period</th>
<th>No. of Cases</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>On the spot</td>
<td>72</td>
<td>47.36</td>
</tr>
<tr>
<td>&lt; 24 Hrs</td>
<td>27</td>
<td>17.76</td>
</tr>
<tr>
<td>24-48 Hrs</td>
<td>12</td>
<td>7.89</td>
</tr>
<tr>
<td>2-7 Days</td>
<td>27</td>
<td>17.76</td>
</tr>
<tr>
<td>8-15 Days</td>
<td>9</td>
<td>5.92</td>
</tr>
<tr>
<td>16-30 Days</td>
<td>3</td>
<td>1.97</td>
</tr>
<tr>
<td>&gt;30 days</td>
<td>2</td>
<td>1.31</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>100</td>
</tr>
</tbody>
</table>

Most of the victims (47.36%), did not survive for significant period of time or died immediately after the incident (Table 6).

Discussion

The high incidence of unnatural death in young Hindu females belonging to rural areas, within 3 years of their marriage was most probably due to unending demands of dowry by their husbands and/or in-laws, for which they sometimes kill or torture the bride in such a way that she commits suicide, which is consistent with other authors findings1-8.

However, the study of Srivastava showed that incidence of death in married females was higher in lower-middle socioeconomic and middle socioeconomic strata and this dissimilarity with our findings could be due to more urban population in their study1.
With respect to the duration of married life, our findings were similar to the findings of Ambade & Aggarwal\textsuperscript{2,3}.

The higher incidence of unnatural death in illiterate and low-standard educated population was due to the more number of cases belonging to rural areas\textsuperscript{7,8} and lower as well as lower middle socio-economic strata\textsuperscript{3,4}. Agnihotri et al found 94.9\% Hindus, 4.22\% Muslims, 0.53\% Sikhs, and 0.35\% Christians in their study which is consistent with our findings \textsuperscript{1}. Burns as a major cause of death in females was also concluded by other authors in their study\textsuperscript{2-6}. The fact that in our study, more victims belonged to rural areas and constitute a major chunk to lower sections of the society. The high incidence of burn deaths, especially among young females is often attributed to cooking on open unguarded flames. Loose, highly inflammable, synthetic garments/saris of the victims are alleged to catch fire suddenly while cooking\textsuperscript{9}.

In India, many deaths are not registered as suicide due to fear of social and legal consequences associated with the same (IPC 306 and 309). The same was the opinion and findings of Batra, Ambade & Godbole\textsuperscript{2,5}. Drowning was found as a cause of death in 1.31\% cases, which was in variance with that noticed by Agnihotri et al in 0.7\% cases and this variation can be attributed to the fact that Kanpur is situated at and near the banks of rivers the Ganges and festivals like Ganga Mela, chhatth, etc., making people more prone for accidental and suicidal drowning\textsuperscript{1}.

Quarrel with husband/in-laws and dowry demand by the husband or his family members were two important reasons behind suicidal as well as homicidal deaths and this finding was consistent with other authors\textsuperscript{2}. Prajapati et al and Kailash et al observed that dowry demand, ill-treatment by in-laws, rash and negligent behavior of husbands and infidelity were the most common reasons for unhappy married lives in all such cases\textsuperscript{6,7}. The findings of the present study were similar to the findings of many other authors as far as age, community, habitat, and manner of alleged dowry death were a concern\textsuperscript{7,8}. India’s National Crime Records Bureau reported that 8,233 Indian women were killed in 2012 in dowry-related violence or nearly one per hour\textsuperscript{8}.

**Conflict of Interest:** There is no conflict of interest.

**Source of Funding:** None

**Ethical Clearance:** Ethical clearance number is 158/IEC LKO/16. Ethical clearance taken from Independent Ethics Committee, KGMU, Lucknow.

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The Meshing between Epstein Barr Virus Nuclear Antigen-1 and P53 in Iraqi Malignant Breast Tissues

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Abstract

In Iraq, breast cancer incidence exceeds any other type of cancers and the etiology not understood well. Epstein Barr virus is a gamma herpesviruses and one of carcinogenic viruses that may implicated to breast carcinogenesis. The nuclear antigen-1 (EBNA-1) protein is the sole EBV antigen that presented in all tumors related to EBV and plays pivotal roles in carcinogenesis of the virus. Examination applied by immunohistochemistry (IHC) to detect and demonstrate the correlation between (EBNA-1) and tumor suppressor protein (P53) expression. The study includes paraffin-embedded tissue blocks of ninety 90 malignant breast tissues and thirty 30 normal breast autopsies. EBNA-1 was significantly expressed in 40/90 (44.4%) of malignant tissues while its expression in normal breast tissues was negative in all tested cases. The tumor suppressor protein P53 was showed negative expression in all normal breast tissues and positive in 27/90 (30%) in malignant breast tissues. A significant negative relationship (r=-0.420; P<0.05) revealed between EBNA-1 and P53 expression. These finding reveal that EBNA-1 was evident in malignant breast tissues and demonstrate the interplay between EBV and p53 raising the possibility that viral infection may be involved in carcinogenesis process.

Keywords: EBV, EBNA-1, P53, and Immunohistochemistry.

Introduction

Malignancy of the breast is the top distributed cancer among females in Iraq with an estimation of 4,720 cases in 2015. The incidence of breast cancer generally exceeds any other type of cancers in Iraq (33.5% of all cancers in Iraq)[1]. The causality of breast cancer is not yet clearly understood, but its incidence related to some environmental factors like viruses such as EBV [2]. EBV belongs to the gamma herpesvirus family, affects over 90% of the world’s population and one of the main viruses to be directly involved in cancer genesis[2]. EBV has been involved as a causative agent of many cancers like Hodgkin’s disease, non-Hodgkin’s lymphoma, Burkitt’s lymphoma, as well as nasopharyngeal carcinoma, arising in immunocompromised individuals[3].

Researches revealed a strong relationship between EBV and breast carcinoma by showing strong evidences[4]. In both primary and metastatic tumors, the constant expression of some of EBV proteins suggests that these proteins are the key player in the EBV-associated tumorigenesis[5]. The tumor suppressor gene, p53 is frequently related to many human cancers because most of the human cancers have mutated p53 [6]. Mutations in p53 happened in breast cancer and are typically associated with more aggressive tumor characteristics, but the clinicopathological and epidemiological features of p53 protein expression is still not clear yet. Some studies suggested that EBV infection induces p53 expression in away or another without causing mutations [7]. Transformed cells by EBV are delicate to apoptosis by P53 mediated pathways[7]. EBV infection of primary cells usually induces a DNA damage-signaling pathway and inhibits cellular proliferation[6]. At the same time, EBV has the capacity to cancel the effect of p53 by multiple means. EBV has many genes that blocks p53-mediated apoptosis or downregulates the expression of p53[9,10]. Epstein-Barr nuclear antigen-1 (EBNA1), demonstrated in all tumors correlated with EBV, may act as the sole protein in many tumors and supposed to be implicated in tumorgenesis[20]. The present study used
to investigate the relationship between EBV-infected patients by testing (EBNA-1) antigen expression with p53 expression in Iraqi breast cancer patients.

Materials and Method

Patients and sampling: The present study have done in a period between January 2019 and October 2019 in Baghdad. Paraffin blocks of breast biopsies were obtained from patients of breast carcinoma after mastectomy. Blocks were collected by a pathologist from Al Alweiya teaching hospital according to ethical considerations and the hospital approval. Formalin fixed, paraffin embedded tissue blocks of (90) malignant breast tissue and (30) normal breast autopsies were obtained. A faculty pathologist re-examined all slides stained with Hematoxylin and Eosin (H&E) for histopathological diagnosis of the chosen blocks.

Immunohistochemistry (IHC): Paraffin-embedded blocks sectioned using a microtome to 4 μm and placed in tissue floatation bath (40C°) and then placed on positively charged slides. The slides were set in oven at 70C° for one hour followed by a series of sequential xylene/ethanol/water washes that remove the wax and rehydrate the tissue for subsequent antibody binding. Heat-induced epitope retrieval (HIER) was applied for antigen unmasking. Heating to boiling in buffer was applied for the slides using a pressure cooker for 30 minutes. Then, the slides were transferred to PBS (phosphate buffer saline) before immunostaining. The sections quenched in a hydrogen peroxide (H₂O₂) by adding drops on the slides for 10 minutes. Protein block solution were applied to each tissue section and allowed it to remain in place for 10 minutes. Then, antibody solution was added to the slides by using micropipette 100-200µl of diluted antibody solution. The slides were incubated overnight (18-22) hour at room temperature. Streptavidin peroxidase and biotinylated Goat Anti-Mouse was added to each slide and incubated for two hours each respectively. Washing of the slides by washing buffer should be applied after each stain. Freshly prepared DAB chromogenic solution was added to the tissue sections and incubated for 10 minutes. The slides washed by distilled water and counterstained by hematoxylin. Aqueous mounting media was added to cover slips where the slides laid on. The slides left for a while to be dried and be ready for examination under the light microscope.

Results

Patients and sampling: A number of (90) malignant breast tissues and (30) normal breast autopsies were included in this study for sampling. Formalin-fixed paraffin embedded tissue blocks of breast obtained from each woman included in this study and according to ethical approval.

Epstein-Barr virus nuclear antigen expression (EBNA-1): All malignant and normal tissue blocks were tested for EBV nuclear antigen (EBNA-1) expression. From 90 breast cancer samples, 40 cases (44.4%) were positively express the antigen while all the normal control cases were show negative expression (figure 1 and 2). Our results show that EBNA-1 expression is significant in malignant breast tissue as compared to normal control specimens (P<0.05).

Figure 1: 40X strong EBNA-1 antigen expression of nuclear and cytoplasmatic staining in breast carcinoma, brown colour is the positive result.

Figure 2: 10X negative EBNA-1 antigen expression in breast carcinoma. Brown colour is not present.
**P53 Expression:** P53 have been tested in all cases by immunohistochemistry (IHC). From (90) cases of breast carcinoma, a number of 27 (30%) cases were express P53 positively. Among them, 17 (18.8%) showed strong expression, 10 (11.1%) cases moderately express p53 (figures3, 4, and 5). According to ages, The protein expressed in 18.8% (n=17) females of age younger than or equal 50 years (≤ 50 years), While females of ages older than 50 years the results of expression 11.1% (n=10). A statistical significant (P<0.05) relation between patients ages and expression of p53. In addition, It was found 14.4% (n=13) of p53 positive expression were of the histological grade III, 12.2% (n=11) of histological grades II and 3.3% (n=3) of histological grade I. Statistical analysis was found to be statistically significant (P<0.05).

Mentioning lymph node involvement, 18.8% (n=17) of positive cases were correlated with lymph node involvement. P53 positive cases with no lymph node involvement recorded in 11.1% (n=10). No significant association have been observed (p>0.05). The tumor size also determined in the present study, It was found that the size range > 10cm was the highest (15.5%, n= 14) compared to other tumor size ranges of p53 expressed cases. Statistics of estrogen and progesterone receptors found in this study. From total number of malignant cases in the study, A percentage of (20%, n=18) that express p53 positively express estrogen negatively and only (10 %, n=9) express estrogen positively. The progesterone receptor negative cases show higher p53 expression (17.7%, n=16), whereas the positive cases seen only in (n=11). Statistical association of p53 expressed cases with hormone receptors, lymph nodes involvements and tumor size were statistically not significant (Table 1).

**Table 1: Some clinic pathological factors and its relation to p53 expression in breast cancer patients**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>P53 expression</th>
<th></th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive (no. of patients)</td>
<td>Negative (no. of patients)</td>
<td></td>
</tr>
<tr>
<td><strong>Lymph node metastasis</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Node +</td>
<td>17</td>
<td>40</td>
<td>N.S</td>
</tr>
<tr>
<td>Node -</td>
<td>10</td>
<td>23</td>
<td>(P &gt; 0.05)</td>
</tr>
<tr>
<td><strong>Tumor size</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 10 cm</td>
<td>13</td>
<td>35</td>
<td>N.S</td>
</tr>
<tr>
<td>&gt; 10 cm</td>
<td>14</td>
<td>28</td>
<td>(P &gt; 0.05)</td>
</tr>
<tr>
<td><strong>Estrogen receptor</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>18</td>
<td>42</td>
<td>N.S</td>
</tr>
<tr>
<td>Positive</td>
<td>9</td>
<td>21</td>
<td>(P &gt; 0.05)</td>
</tr>
<tr>
<td><strong>Progesterone receptor</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>26</td>
<td>34</td>
<td>N.S</td>
</tr>
<tr>
<td>Positive</td>
<td>11</td>
<td>17</td>
<td>(P &gt; 0.05)</td>
</tr>
</tbody>
</table>

**Figure 3:** 40X Strong positive Cytoplasmic and nuclear expression of p53 in breast carcinoma. Dark color showing the positive result

**Figure 4:** 40X moderate positive Cytoplasmic and or nuclear staining of P53 in breast carcinoma. Dark color showing the positive result

**Figure 5:** 10X negative p53 expression in breast carcinoma, no dark brown color appeared
The Correlation between EBNA-1 and P53 expression: Significantly negative relationship (r=-0.420; P<0.05) was recorded between (EBNA-1) antigen expression and P53 protein expression in malignant breast tissues. No other relationships noticed between EBNA-1 antigen and the clinicopathological parameters of malignant breast tissues.

Discussion

The present study revealed that EBV significantly expressed in malignant breast tissues than in normal autopsies. EBNA-1 antigen demonstrated in 44.4% of the breast cancer cases, which indicated that EBV might have a role in breast carcinogenesis. A previous studies support the present indication, serological researches on breast cancer patients on EBV relation to disease using the traditional marker of EBV revealed that EBV IgG levels score (97/208; 96%)\[11\]. Another study tested for both anti-EBNA-1 IgG level by ELISA technique and EBNA-1 antigen expression by immunohistochemistry technique (IHC), the results show that 90.9% of breast cancer cases were seropositive for anti-EBNA-1 IgG and EBNA-1 was positively expressed in 28/51 cases (54.9%) by IHC\[12\]. The nuclear antigen 1 (EBNA1) protein is the only EBV protein that presented in all tumors that are associated with EBV and plays many important roles in the latency of the virus. The cellular processes that the viral protein play is to reduce apoptosis and increase cell survival\[15\].

Determining the P53 expression is important for aiding in diagnosis and helping to decide the best therapeutic way in addition to predicting prognosis\[13\]. Although our present study found significant association of p53 expression with tumor grade, it demonstrated non-significant relationships with other tumor parameters. Previous reports indicated that, P53 expression correlated with clinical grading of the disease and age of the patients significantly. No significant statistical correlations observed with lymph node involvement, tumor size, and expression of estrogen and progesterone receptors\[21,14\]. In spite, these associations were not significant in statistical manners of the present study, the contrasts in the results explained to genetic, environmental, and possibly social factors\[12,13\].

All the previous reports of p53 expression in malignant breast tissues extended approximately from 10% to 70%\[12\]. During this project, p53 demonstrated in 30% of the samples. These investigations can be compared to previous researches exclusively regarding the associations with histological grading and hormonal status. The relatively high expression of p53 could be related to genetic and environmental parameters that reveals the mutation type of P53. In addition, Most of the cases at relatively advanced stages of the disease when they diagnosed for the first time and are already at higher expression of P53. That may reflect the bad prognosis in many of the present study cases\[11\]. P53 is a tumor suppressor gene, mutations in gene commonly occur in breast cancer. Alterations in the gene lead to change the expression of many other genes that controlled directly or indirectly by p53. The results are malfunctioning of DNA damage repair pathways, cell-cycle arrest, and apoptosis\[16\].

The relationship between EBNA-1 and P53 is not clear yet. A study in Brazil found that there was a correlation between EBNA-1 and p63 expression, but not between EBNA-1 and p53\[17\]. Our present study revealed that there is a significant negative relationship between (EBNA-1) antigen expression and P53 in breast cancer patients meaning that increased expression of EBNA-1 lowers p53 expression. A study, dealt with a key regulator of p53 (USP7), determined that EBNA1 binding to USP7 lowers p53 levels and protect cells from apoptotic challenge\[18\]. A researchers in (2019) found that EBNA1 lowers p53 level in osteosarcoma cell\[19\].

Conclusion

The present study revealed Epstein Barr virus nuclear antigen-I was significantly expressed in malignant breast tissues and this raises the possibility that EBV may have a role in carcinogenesis of the breast. Tumor suppressor protein P53 expressed in about 30% of the malignant cases. The correlation between EBNA-1 and P53 expression was negatively significant which means that increasing the expression of EBNA-1 in malignant breast tissues may lower the tumor suppressor protein P53. This foundation may explain one the EBV roles in tumorgenesis of the breast in Iraqi patients.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required

References

Iraqi Cancer Registry, 2015.


17. Ribeiro-Silva A. Does the correlation between EBNA-1 and p63 expression in breast carcinomas provide a clue to tumorigenesis in Epstein-Barr virus-related breast malignancies?, Braz J Med Biol Res. 2004. 37, 89-95


Pro- and anti-inflammatory Cytokines in Coronavirus Disease 2019

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Abstract

It has long been believed that cytokines have an important function in immunopathology during viral infection. Coronavirus disease 2019 (Covid-19) is a contagious viral disease caused by severe acute respiratory syndrome coronavirus 2. Covid-19 can be fatal because of an overactive immune response and release of cytokines. This review focuses on the role of cytokines in COVID-19.

Keywords: COVID-19, cytokines, Immune response.

Introduction

Coronavirus disease 2019: Coronavirus disease 2019 is the infectious disease caused by (SARS-CoV-2) severe acute respiratory syndrome coronavirus 2. First identified in December 2019 in Wuhan, and has since spread all over the world, resulting in the ongoing 2019–20 coronavirus pandemic[1]. Main symptoms include fever, dry cough and fatigue. It may be accompanied by runny nose, sore throat, vomiting and diarrhea. Most patients have mild symptoms, while a few develop into viral pneumonia and multi-organ failure. The incubation period of virus is generally 5 days however may range 2 to 14 days. The disease can spread from person to person through small droplets produced by coughing, sneezing, or talking. These droplets land on objects and surfaces being infectious over long distances[2]. Low protective immune response causes the virus to spread and destroy infected tissues, especially in organs that have high angiotensin-converting enzyme 2 expressions, such as intestine and kidney. The damaged cells induce innate inflammation in the lungs that is largely mediated by pro-inflammatory macrophages and granulocytes. Lung inflammation is the main cause of life-threatening respiratory disorders at the severe stage[3].

Role of Cytokine in COVID-19: Cytokines are inflammatory immunological proteins that act as molecular messengers between cells, which fight infections and ward off cancers. The overproduction of specific inflammatory cytokines is a hallmark of viral infection[4]. It has been suggested that the pathogenesis of COVID-19 is mediated by disproportionate immune responses and the ability of the virus to circumvent innate immunity[5]. When COVI-19 infects the upper and lower respiratory tract it can cause mild or highly acute respiratory syndrome with consequent release of pro-inflammatory cytokines². Chen and colleagues reported that COVID-19 might mainly act on lymphocytes, especially T lymphocytes, and induce a cytokine storm in the body, which is characterized by increased plasma concentrations of cytokines[6]. Mehta, et al recently stated there is accumulating evidence suggests that a subgroup of patients with severe COVID-19 might have cytokine storm syndrome. The authors suggest that patients with severe stage must be screened for hyperinflammation and subgroups of patients identified for whom immunosuppression therapy could improve mortality[7]. However, in most moribund patients, 2019-nCoV infection is associated with a cytokine storm[8].

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In those who survive intensive care, these aberrant and excessive immune responses lead to lung damage and fibrosis, causing functional disability and reduced quality of life\textsuperscript{[9,10]}.

**Proinflammatory Cytokines:** Cytokine storm is a systemic inflammatory response that can be triggered by a variety of factors such as infections. Shimabukuro-Vornhagen et al., pointed out that during the cytokine storm, three important cytokines in the IL-1 family are involved IL-1\(\beta\), IL-18, and IL-33\textsuperscript{[11]}. Recent study declared that COVID-19 stimulate pro-inflammatory cytokines productions such as IL-1\(\beta\) and IL-6 via the toll like receptors that causes the release of active mature IL-1\(\beta\) which is a mediator of lung inflammation, fever and fibrosis\textsuperscript{[12]}.

It is well known that TNFs are key inflammatory factors that trigger a cytokine storm. They are attractive targets for controlling the cytokine storm. Similarly Qin and colleagues showed that most patients with COVID-19 had high serum levels of TNF-\(\alpha\) along with IL-1\(\beta\) and IL-6, elevation levels of these cytokines have also been found in patients with severe COVID-19 as compared to the non-severe ones\textsuperscript{[5]}. On the other hand Chinese medical researchers have found that the increased expression of interleukin-2 receptor and IL-6 in serum is expected to predict the severity of the 2019-nCoV pneumonia and the prognosis of patients\textsuperscript{[13]}. Likewise higher plasma levels of other inflammatory cytokines (IL-7, IL-8, IL-9, IL-10, MCP-1, and IFN-gamma etc.) were observed in patients with COVID-19 (2). IL-17 play a role in pathogenesis of COVID-19 infection and blocking it could help those patients who have high level of IL-17\textsuperscript{[14]}. Additionally, in severe cases, a reduction of CD4\(^+\) and CD8\(^+\) T cells and a decrease of regulatory T cells has been found, likely due to high expression of proinflammatory cytokines in COVID-19 patients\textsuperscript{[5]}.

**Anti-inflammatory Cytokines:** Anti-inflammatory cytokines, such as IL-1Ra, IL-37 or IL-38, can provide relief in both systemic inflammation and fever that occur after infection. Conti et al., demonstrate that the suppression of IL-1\(\beta\) by IL-37 in inflammatory state induced by COVID-19 can have a new therapeutic effect previously unknown. As well IL-38 is a potential therapeutic cytokine which inhibits inflammation in viral infections including that caused by COVID-19, providing a new relevant strategy\textsuperscript{[13]}. Dissimilar SARS patients, patients with COVID-19 also have elevated levels of Th2 cell secreted cytokines (such as IL-4 and IL-10), which inhibit the inflammatory response\textsuperscript{[3]}. However, infection with 2019-nCoV appears to be initially associated with an increased Th2 response, which might reflect a physiological reaction to curb overt inflammatory responses\textsuperscript{[2]}.

**Conclusion**

In conclusion both T-Th1 and Th2 cytokines underline the role of the immune processes in the pathogenesis of COVID-19.

**Conflict of Interest:** The authors and planners have revealed no possible conflicts of interest, financial or else.

**Ethical Clearance:** From Ethical Committee, College of Dentistry, University of Baghdad.

**References**

7. Hui DSC, Zumla A. Severe acute respiratory syndrome: historical, epidemiologic, and clinical


An Anthropometric Study of Stature Estimation from Foot Morphometry in North Indian Population

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Abstract

Background and Objectives: The aim of present study is to find the correlation of foot morphometry with stature and to derive the regression equation for stature estimation among two endogamous (baniya and jats) groups of North India.

Material and Method: The present study was carried out at Department of Anatomy, MMIMSR Mullana–Ambala, on 400 subjects (100 males, 100 females of each group) belonging to known endogamous group (baniya and jats) of Haryana, age group ranged between 21-35 years. Height and foot length, foot breadth was measured. Foot index was calculated. Statistical analysis including mean, standard deviation for stature and foot morphometry of both sides were calculated separately for both sexes. Pearson’s correlation coefficient was calculated to find correlation between stature and different foot morphometry. To estimate stature from foot morphometry linear regression analysis was done.

Results: The mean and standard deviation for height in males was 173.68 ± 7.336 and in females was 160.73 ± 10.049 with highly significant p value. The mean foot length, foot breadth of males was higher than females with statistically significant p value. In males, the foot length and foot breadth of both sides have a highly significant correlation with height. In females the correlation of height was highly significant with foot length, foot breadth and foot index among both the groups.

Conclusion: A significant correlation coefficient was observed between height and foot length in males. In females, a significant correlation was observed between height and foot length and foot breadth. If either of the measurement is known (height or foot length/foot breadth), the other can be calculated. This would be useful for Anthropologists and Forensic medicine experts.

Keywords: Foot length, Foot breadth, Foot index, jats, baniya, correlation.

Introduction

Anthropometry is a series of systematic measuring techniques that express quantitative dimensions of human body and skeleton.¹ Forensic investigations use an anthropometric approach in the identification of victims.² Over the years, the anthropometric measurements of various anatomical structure for prediction and estimation of stature has become very useful, especially when the skeletal remains are often observed to be incomplete or extensively dismembered.³ Stature estimation has a very important role to play in forensic anthropometry for personal identification. Specifically, since each individual has different variations of body profile, estimating someone’s height can have an important role in an investigation.⁴ The stature of an individual is an inherent characteristic which varies with race and it is determined by genetic constitution.
of a person, geographical location, environment and the climatic conditions. With increasing frequency of mass disasters, it is essential to find out correlations between stature, age, and sex of an individual with variable information collected from different systems, organs or its parts which is of immense importance. Stature plays a key role in establishing the identity from unknown, decomposed and fragmented remains in medico legal cases. Human stature is an anatomical complex of linear dimensions, including skull, vertebral column, pelvis and lower extremities, so that it is assumed that significant association exist between the total stature and these individual body parts. Stature of a person is proportional to dimensions of various body parts. It is established that dimensions of lower extremity show higher association with stature than upper extremity.

Height estimation by measurement of various long bones has been attempted by several workers. Each worker has derived own formula to estimate height from long bones. In 1968, Rutishauser for the first time showed that the reliability of prediction of height from foot length was as high as that from long bones. Ossification and maturation in the foot occurs earlier than the long bones and therefore, during adolescence age, height could be more accurately predicted from foot measurement as compared to that of long bones.

Like other parts of body such as head, trunk, lengths of upper and lower limbs, the foot size also displays a definite biological correlation with stature on the basis of this relationship it is possible to predict the stature from foot and its segments. Various studies have reported a statistically significant positive association of stature with foot measurements. Some studies suggest the use of stature – foot index, multiplication factor method and regression equation method to estimate stature from foot dimensions. The aim of present study is to find the correlation of foot morphometry with stature and to derive the regression equation for stature estimation among two endogamous groups.

Material and Method

The present study was carried out at Department of Anatomy, MMIMSR Mullana –Ambala, on 400 subjects (100 males, 100 females of each group) belonging to known endogamous group (baniya and jaat) of Haryana, age group ranged between 21-35 years. Prior written consent for the study was taken from all the subjects both in English and in vernacular. Cases with foot anomalies, trauma, inflammations and surgery was excluded for the investigation.

Equipments used: Osteometric board, Flexible metallic measuring tape.

Height was measured by making the subject stand erect and barefooted on a flat floor and the vertical distance between the point vertex, (highest point on the head), when the head is held in the Frankfurt’s horizontal plane (which is obtained by joining the infra orbital margin to the upper margin of external acoustic meatus) and the heel touching the floor was measured in cms.

Foot measurements were taken with the help of osteometric board:

- Osteometric board: Osteometric board is an anthropometric instrument that consists of a flat board with two ends, one of which is movable and travels along a routed track. This is a preferred instrument for measuring long bones. The object to be measured is placed between the two end pieces and the movable end brought up to the object, where the measurement scale can be read.
- Foot length: Foot length was taken as a straight distance between the most posteriorly projecting points of heel (pternion) to the most anterior projecting point (Acropodion) of the first or the second toe whichever will be bigger when the foot is fully stretched.
- Foot breadth: Foot breadth was measured as a straight distance from metatarsaletibiale (the most medially placed point on the head of first metatarsal) and metatarsalefibulare (the most laterally placed point on the head of the fifth metatarsal) when the foot will be fully stretched.
- Foot index = foot breadth/foot length x 100

Statistical analysis: Data was analyzed using Statistical Package for Social Sciences (SPSS, version 20). Descriptive statistics including mean, standard deviation, minimum and maximum value for stature and foot morphometry of both sides were calculated separately for both sexes. Pearson’s correlation coefficient was calculated to find correlation between stature and different foot morphometry. To estimate stature linear regression analysis was applied.
Results

The mean and standard deviation for height in males was 173.68 ± 7.336 and in females was 160.73 ± 10.049 with highly significant p value. The mean foot length, foot breadth of males was higher than females with statistically significant p value. Table 1. In Baniya males, the foot length of both sides have a highly significant correlation with height at 0.01 level(2 tailed) and foot breadth of both sides is significantly correlated with height at 0.05 level(2 tailed). In Jat males, Right foot length and right foot breadth shows a correlation which is significant at 0.05 level (2 tailed) and left foot length and height are correlated and this correlation is highly significant at 0.01 level (2 tailed). The correlation of foot length, foot breadth and foot index in females of both the groups was highly significant at 0.01 level (2 tailed) as compared to the male group. Table 2 The linear regression equations were applied on the parameters, which were highly correlated with height. In males, foot length (right and left) and in females, foot length(right) and foot breadth(left side). From these parameters, certain equations to estimate stature (dependent variable) from foot morphometry (Independent variable) are derived as follows: Linear regression equation to estimate height for various parameters studied in male and female group:

In Jats:

Height = 126.597 + 1.979 (Left foot length)

In baniya:

Height = 109.262 + 2.457 (Right foot length)

Linear regression equation to estimate height for various parameters studied in females:

In Jats:

Height = 90.831 + 2.920 (Right Foot Length)
Height = 88.309 + 1.744 (Right Foot Length) + 3.318(Left Foot Breadth)

In baniya:

Height = 189.636 – 3.616 (Left Foot Breadth)
Height = 133.758 + 2.453 (Right Foot Length) – 3.520 (Left Foot Breadth)

Table 1: Descriptive statistics of Age, Height and Foot morphometry among study population

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Males (Mean ± SD)</th>
<th>Females (Mean ± SD)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=200</td>
<td>N=200</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>24.80 ± 3.759</td>
<td>24.91 ± 3.307</td>
<td>0.7562</td>
</tr>
<tr>
<td>Height</td>
<td>173.68 ± 7.336</td>
<td>160.73 ± 10.049</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Foot Breadth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>9.59 ± 1.136</td>
<td>8.60 ± 0.913</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Left</td>
<td>9.96 ± 1.251</td>
<td>8.86 ± 0.986</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Foot Length</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>26.26± 1.600</td>
<td>23.48 ± 1.846</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Left</td>
<td>26.60 ± 1.609</td>
<td>23.79 ± 1.868</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table 2: Correlation between stature and foot morphometry among study groups

<table>
<thead>
<tr>
<th>Study Groups</th>
<th>Sex</th>
<th>Height (Mean)</th>
<th>Correlation</th>
<th>Foot Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Right Foot Length</td>
<td>Right Foot Breadth</td>
</tr>
<tr>
<td>Baniya</td>
<td>Male</td>
<td>170.626</td>
<td>0.000**</td>
<td>0.02*</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>158.196</td>
<td>0.008**</td>
<td>0.005**</td>
</tr>
<tr>
<td>Jat</td>
<td>Male</td>
<td>176.73</td>
<td>0.023*</td>
<td>0.035*</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>162.791</td>
<td>0.000**</td>
<td>0.000**</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).
Discussion

The present study focused on foot morphometry and its correlation with stature among two endogamous groups (Baniya, jats) of North India. It was seen that a significant correlation was seen between height and foot length in male study group. Among females, height is showing significant correlation with foot breadth, foot length and foot index (in jats and baniya females). (Table 2) Various previous studies conducted to find correlation between stature and foot morphometry agrees with our study. They concluded that there is significant correlation between height and various foot parameters as shown in Table 3.

Table 3: Comparison of correlation between stature and foot morphometry of present study with previous studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample size</th>
<th>Males</th>
<th>Females</th>
<th>Parameters</th>
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</thead>
<tbody>
<tr>
<td>Present study</td>
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<td>200</td>
<td>200</td>
<td>Height and foot length, foot breadth and foot index</td>
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<tr>
<td>Patel SM et al (2007)</td>
<td>502</td>
<td>278</td>
<td>224</td>
<td>Height and foot length</td>
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<tr>
<td>Mansur DI et al (2012)</td>
<td>440</td>
<td>258</td>
<td>182</td>
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<tr>
<td>Shailesh M Patel et al (2011)</td>
<td>285</td>
<td>149</td>
<td>136</td>
<td>Height, foot length and foot breadth</td>
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<tr>
<td>Mohantry BB et al (2012)</td>
<td>300</td>
<td>206</td>
<td>94</td>
<td>Height and foot length</td>
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<tr>
<td>Shankar GS et al (2018)</td>
<td>234</td>
<td>98</td>
<td>136</td>
<td>Height and foot length</td>
</tr>
</tbody>
</table>

Stature estimation is considered as one of the important parameters in identification of a person. various body parts shows biological correlation with stature. Therefore, many workers have utilized this fact to use body parts or skeletal remains to estimate stature. A study by Qamra et al, measured height, foot length and foot breadth of 1015 adults (519 males and 496 females). They developed method for estimating height from foot morphometry. Sen et al studied the foot measurements and stature of Rajbanshis of West Bengal (150 males, 150 females) and derive various formulas to evaluate height from foot morphometry. Kanchan et al studied the relationship between stature and foot dimensions among Gujjars, a north indian endogamous group. They measured height, foot length and foot breadth on 100 males and 100 females and derive multiplication factors and regression equations from foot dimensions to estimate stature. Dhaneria et al, concluded that foot length and foot breadth showed positive correlation with stature. out of both these parameters foot length is a better predictor of stature they also derive linear regression equation for estimation of stature from foot length and foot breadth.

Conclusion

The present study has established a strong correlation between height, foot length and foot breadth among study groups. Regression equation have also been established. In males, the correlation between height and foot length was more than foot breadth. In females, both foot breadth and foot length has significant correlation with height. In baniya females in addition to foot length and foot breadth, a significant correlation was seen between height and foot index. To conclude, foot length can be considered as a better predictor of stature in males than in females. Among comparison between endogamous groups in baniya females besides foot length and foot breadth, foot index is also a good predictor of stature. If either of the measurement (foot length, foot breadth, stature) is known the other can be calculated. However, these equations are population specific and cannot be applied to other population. Therefore, population specific studies are suggested that may be useful in examining dismembered human remains in medicolegal cases.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Ethical clearance and approval was obtained from the institutional Ethics Committee

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Correlation between QT Interval with Left Ventricular Mass Index (Using M-Mode Echocardiography) and Blood Pressure in Patients with Hypertension

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Abstract

Background: In patients with hypertension, the excessive blood pressure load correlates with neurohormonal activities and will lead to left ventricular remodeling. QT interval often occurs in patients with hypertension. The correlation between structural changes and repolarization remains unclear.

Method: This study involved 62 patients with hypertension (38 female and 24 male) to whom blood pressure, electrocardiogram and echocardiography examination were performed simultaneously. The correlation between QT interval with left ventricle mass index and blood pressure was statistically analyzed using Pearson correlation test.

Results: The mean of QTc interval in patients with hypertension was 390.40±30.73 millisecond. Based on the echocardiography examination results, the mean of left ventricular mass index was 75.38±12.36 with RWT of 0.36±0.06. Pearson correlation statistical analysis shows a correlation between QTc interval with left ventricular mass index (r=0.277; p value=0.030) and systolic blood pressure (r=0.317; p value=0.014).

Conclusion: QT interval correlated with increased left ventricular mass index and systolic blood pressure in hypertension patients with normal geometry and concentric remodeling.

Keywords: QT interval, left ventricular mass index, blood pressure, hypertension.

Introduction

Hypertension is considered the primary cause of morbidity and mortality in cardiovascular. In 2000, hypertension occurred in nearly 1,000 million people or almost 26% of adult population globally, 333 million people in developing countries and 639 million in underdeveloped countries(1). According to epidemiology data in America, hypertension prevalence in 2004 reached up to 29% and increased to 34% in 2006, while in Indonesia was 32.2%(2).

Hypertension is defined as the persistent increase of blood pressure to above 140/90 mmHg. High blood pressure is a long-term health problem that most frequently send people to health facilities(3). American Heart Association has predicted that the total cost for hypertension in 2010 would reach 76,600 million dollars. The data in America reported that of all the patients, 80% knew their diseases, 71% following routine medication and 48% could achieve controlled blood pressure(4).

Uncontrolled hypertension increase the risk of coronary heart disease, stroke and heart failure. Heart failure could occur due long-term hypertension or due to
secondary results of coronary heart disease. Continuous high blood pressure stimulus will lead to remodeling and left ventricular hypertrophy. Left ventricle remodeling is a structural changes (dimension, mass and form) of the heart as the response to the hemodynamic loads related to neurohormonal activation(5).

Until recently, electrocardiogram is still considered an important diagnostic tool in cardiology. Electrocardiogram examination in hypertension patients showed several abnormalities, i.e. QRS complex expansion (as the appearance of left ventricle hypertrophy), QT interval elongation etc. QT interval depicts the total amount of time required to activate and to relax the ventricle(6).

Clinically speaking, left ventricular hypertrophy is more often detected using echocardiography (EKG). In echocardiography, left ventricular hypertrophy can be detected more accurately by evaluating the wall thickness and/or left ventricular mass index towards body size. Several criteria of LVH in EKG are highly specific but less sensitive. Several previous studies showed a correlation between left ventricle hypertrophy and EKG repolarization changes, such as QT interval elongation(7). Although several evidences have confirmed that repolarization impairment is the initial process, but the correlation between the effect of light ventricular hypertrophy or left ventricular structural changes with EKG repolarization remains unclear. This study aims to analyze the correlation between QT interval with left ventricular mass index and blood pressure in patients with hypertension.

**Method**

This is an analytical observational study which used cross-sectional approach or design. It was conducted in Department of Cardiology and Vascular Medicine, Dr. Soetomo General Hospital Surabaya from October to December 2012. The samples of this study were patients with hypertension undergoing outpatient treatment in cardiology unit of Dr. Soetomo General Hospital Surabaya from November 2012 who met the inclusion criterion (having normal left ventricular ejection fraction with EF >55%) and were willing to be enrolled in the study procedure as shown by their signing the informed consent(8).

The samples were 62 patients with hypertension who were treated in outpatient cardiology unit and underwent echocardiography examination. The data were analyzed using SPSS 17.0 program for Windows (SPSS, Inc., Chicago, IL). One-sample Kolgomorov-Smirnov test was used to test the normality of data distribution. Intra-observer and inter-observer variability were evaluated using correlation test, Bland Altman test and variability percentage. The results were considered significant if the p significance value was <0.05(9).

**Results**

<table>
<thead>
<tr>
<th>N = 62</th>
<th>Gender</th>
<th><strong>Mean ± SD</strong></th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>♂ = 24; ♀ = 38</td>
<td>Age</td>
<td>56.94 ± 7.34</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hypertension period</td>
<td>5.73 ± 3.36</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BMI</td>
<td>24.25 ± 3.47</td>
<td>15.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Systolic blood pressure</td>
<td>132.66 ± 14.16</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diastolic blood pressure</td>
<td>80.24 ± 9.93</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Heart rate</td>
<td>75.79 ± 10.31</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td></td>
<td>QTc</td>
<td>390.40 ± 30.73</td>
<td>320</td>
</tr>
</tbody>
</table>

Based on gender, there were 38 female samples (61%) and 24 male samples (39%) with ages varied between 40-75 years old and age mean of 56±7.3 years old. The samples’ length of hypertension period ranged between 2-15 years with the mean of 5.7±3.3 years. The mean of the samples’ QT interval based on EKG examination was 390.4±30.7 millisecond. The means of systolic and diastolic blood pressure were 132.6±14.2 and 80.24±9.9 respectively.
Table 2. Table of intra and interobserver variability

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Intra-observer</th>
<th>Inter-observer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Intra-observer Variability</td>
<td>% Inter-observer Variability</td>
</tr>
<tr>
<td>R</td>
<td>Mean diff (SD)</td>
<td>R</td>
</tr>
<tr>
<td>LVMI</td>
<td>0.92</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>0.55±4.73 p=0.66</td>
<td>2.39</td>
</tr>
<tr>
<td>RWT</td>
<td>0.72</td>
<td>3.05</td>
</tr>
<tr>
<td></td>
<td>1.80±8.57 p=0.43</td>
<td>4.33</td>
</tr>
</tbody>
</table>

Intra-observer and inter-observer evaluation was conducted for LVMI, while Bland Altman method was used for RWT. The evaluations were performed in 15 patients. The analysis results showed that most patients had a significant intra-observer and inter-observer correlation and inter-observer variability of <5%.

Table 3. Data normality analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Statistic</th>
<th>Df</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>LVMI</td>
<td>0.158</td>
<td>62</td>
<td>0.200</td>
</tr>
<tr>
<td>RWT</td>
<td>0.207</td>
<td>62</td>
<td>0.200</td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td>0.197</td>
<td>62</td>
<td>0.054</td>
</tr>
<tr>
<td>Diastolic blood pressure</td>
<td>0.228</td>
<td>62</td>
<td>0.000</td>
</tr>
<tr>
<td>QT interval</td>
<td>0.197</td>
<td>62</td>
<td>0.122</td>
</tr>
</tbody>
</table>

The results of data normality conducted in the study’s variables showed a normal distribution in the variable QT interval based on Kolmogorov-Smirnov significant value (p >0.05). To find out the correlation between QT interval and left ventricular mass index, Pearson correlation test was performed on the respondents’ RWT and systolic blood pressure which were evaluated using M-mode echocardiography. The correlation between QT interval and blood pressure was tested using Spearman method.

Table 4. Correlation between QT interval with respondents’ left ventricular mass index and blood pressure

<table>
<thead>
<tr>
<th>Variable (n=62)</th>
<th>QTc</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Correlation</td>
<td></td>
</tr>
<tr>
<td>LVMI</td>
<td>r = 0.277</td>
<td>0.030</td>
</tr>
<tr>
<td>RWT</td>
<td>r = 0.215</td>
<td>0.093</td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td>r = 0.312</td>
<td>0.014</td>
</tr>
<tr>
<td>Diastolic blood pressure</td>
<td>r = 0.031</td>
<td>0.813</td>
</tr>
</tbody>
</table>

Table above shows that diastolic blood pressure has higher P value than systolic. The P value of RWT also higher than LVMI in terms of correlation value.

Table 5. Basic characteristics of the respondents based on echocardiography examination

<table>
<thead>
<tr>
<th></th>
<th>Normal Echo (Rerata ± SD)</th>
<th>Left Ventricular Remodeling (Rerata ± SD)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>♂ 33 ♀ 18</td>
<td>♂ 5 ♀ 6</td>
<td>0.234</td>
</tr>
<tr>
<td>Age</td>
<td>57.12 ± 7.29</td>
<td>56.09 ± 7.89</td>
<td>0.351</td>
</tr>
<tr>
<td>Hypertension period</td>
<td>5.79 ± 3.46</td>
<td>5.46 ± 2.91</td>
<td>0.846</td>
</tr>
<tr>
<td>BMI</td>
<td>24.28 ± 3.52</td>
<td>24.10 ± 3.42</td>
<td>0.818</td>
</tr>
</tbody>
</table>
Table above shows that different test analysis was performed on the confounding factors, i.e. gender, age, hypertension period and obesity, in the respondents’ characteristics based on left ventricular remodeling. Left ventricular remodeling occurred if the LVMI in female was >97 g/m\(^2\) and 110 g/m\(^2\) >0.42.

**Discussion**

Hypertension was still considered the primary health problem among the society. People with hypertension often developed abnormal heart structure and functions including left ventricular remodeling and hypertrophy. Left ventricular remodeling was the structural changes (dimension, mass and form) in the heart as a response towards hemodynamic loads related to neurohormonal activation\(^{(10)}\).

Left ventricular hypertrophy occurred as a compensation to maintain to keep heart’s pumping function adequate towards the chronic increase of preload and after-load. The chronology of ventricular load increase until cellular hypertrophy occurred was due to interactions among several systems \(^{(11)}\). Myocardial strain due to excessive volume loads or pressure loads stimulate cardiac fibroblast and myocytes expressed a number of fibrotic and growth factors including angiotensin II, insulin growth factor I (IGF I), IL-6, TGF-β, and endotelin-1 \(^{(12)}\). All those humoral factors could trigger myocardial hypertrophy occurrence. Persistent hypertension stimulated RAAS (rennin, angiotensin II and aldosteron), endotelin-1 and TGF-β to trigger transition from fibroblast to myofibroblast. Myofibroblast then increase the production of extracellular protein matrix including fibronectin, laminin, collagen I and II which caused fibrosis progressivity\(^{(10)}\). The increase of cardiomyocyte size, extracellular matrix changes and fibrosis accumulation led to left ventricular remodeling. In echocardiography examination, left ventricular concentric remodeling occurred if the relative wall thickness (RWT) was >0.42 with left ventricular mass index was still within the normal range. The prevalence of left ventricular hypertrophy correlated with old age and the degree of hypertension severity, which ranged around 6% in young patients aged <30 years old, 43% in the age of >69 and 20-50% in mild to severe hypertension \(^{(13)}\).

From the respondents’ data in this study, the author obtained 62 subjects (24 were male and 38 were female) aged 40-75 years old. Their hypertension history period ranged between 0.5-15 years and they have undergone at least routine medication in polyclinic. Gender, age, hypertension history period and obesity affect the occurrence of left ventricular remodeling. Difference test analysis was performed on those four confounding factors using Chi-square and t-test statistical analysis and no significant result was obtained. In the respondents’ data, those four factors did not give any significant difference.

No left ventricular hypertrophy was found in EKG examination as well (based on Romilt Estes criteria). The results of M-mode echocardiography showed that left ventricular mass index was within the normal range with the mean of 75.38±12.63 g/m\(^2\) (the lowest was 49.44 and the highest was 97.92 g/m\(^2\)) while the mean of RWT was 0.36±0.06 (the lowest was 0.28 and the highest was 0.48). No left ventricular hypertrophy was found in the data. Left ventricular geometric changes in hypertension patients were still within normal size or left ventricular remodeling. All respondents showed normal left ventricular systolic functions with the mean of EF by Teich amounted of 68.59±5.04 (%). Normokinetic was also found in regional wall motion based analysis based on echocardiography \(^{(14)}\).

In this study on tested rats, there was QT elongation related to the rats’ blood pressure compared to the rats’ left ventricular mass index. Another studies also showed the correlation between the value of arterial blood pressure and the average blood pressure with QT interval elongation in patients with hypertension. A study conducted by Latea et al. (2010) confirmed that anti-hypertension therapy could decrease QT interval related to decreased blood pressure and left ventricular mass index \(^{(15)}\). The result of this study also supported that of the previous ones where there was a significant correlation between QT interval and left ventricular mass index in respondents with hypertension. The data above show elongated QTc interval that correlated with the increase of left ventricular mass index with weak correlation (r = 0.27, p value=0.030). The possible explanation on the weak correlation was because it was related to the hypertension period and the degree of hypertension severity. The respondents in this study had the hypertension period of 3-8 years and not very high blood pressure.

QT interval positively correlated with left ventricular mass index in hypertension patients who have not yet...
developed left ventricular hypertrophy. Repolarization impairment in this study might be due to left ventricular remodeling, i.e. fibrosis, extracellular matrix increase and perivascular fibrosis that caused conduction impairment. In this study, the QTc was longer in hypertension patients with left ventricular remodeling. In microscopic level, left ventricular hypertrophy including myocyte hypertrophy, fibrosis and increased interstitial collagen tissue would lead to action potential time elongation (16). The heart of rats with hypertrophy would experience action potential elongation and specific impairment in potassium repolarization (I_{op})(17).

Several studies showed data in which a correlation between QT interval and blood pressure in hypertension patients was found. This study showed a positive correlation between QT interval and systolic blood pressure ($r=0.312$, $p$ value=0.014). Systolic blood pressure affect QT interval more significantly that it did diastolic blood pressure. The primary factor that was responsible for left ventricular hypertrophy was excessive pressure loads. It would lead to myocardial changes, i.e. increased left ventricular mass index due to remodeling or left ventricular hypertrophy (18). Increased left ventricular mass index caused QT interval elongation. The previous studies showed a correlation between QT interval correlation and excessive sympathetic activities in essential hypertension patients (6). In this study, hypertension patients’ blood pressure evaluation results was still in control or increased up to level I (according to JNC VII), but the higher blood pressure correlated with QT interval elongation in respondents’ data.

Left ventricular mass index was examined using echocardiography in which there was a limitation compared to other examinations such as magnetic resonance image. LVMI examination using M-mode echocardiography resulted in variabilities with the difference of nearly 5% which might contribute to the difference of 50 gram. The variabilities particularly occurred in measuring of wall thickness and determining the myocardial lining limit. For reproducibility, it was a bit better to use ASE measurement method compared to Penn (19).

Based on Framingham data, RWT gave left underestimated ventricular hypertrophy measurement, which was 5%, since it only used posterior wall thickness. Systolic blood pressure affected ventricular repolarization (20). Blood pressure kept changing from time to time and therefore, a measurement in one time could not represent a patient’s blood pressure for 24 hours.

**Conclusion**

Left ventricular hypertrophy was rarely found in EKG examination of hypertension patients since this examination was highly specified but less sensitive. Another EKG impairment that often occurred in hypertension patients was QT interval elongation. The respondents’ mean of QT interval was 390.40±30.73 millisecond.

Echocardiography examination in hypertension patients showed normal left ventricular mass index (based on ASE recommendation, in female was <95 g/m$^2$ and in male was <115 g/m$^2$) and RWT of above 0.42 which indicated left ventricular concentric remodeling. A weak correlation was found between QT interval with left ventricular mass index and systolic blood pressure. QT interval elongation was proportional to the increase of LVMI and high systolic blood pressure in the respondents.

**Ethical Clearance:** The research process involves participants in the survey using a questionnaire that was accordant with the ethical research principle based on the regulation of research ethic committee. The present study was carried out in accordance with the research principles and was approved by the Ethics Committee of Faculty of Medicine Universitas Airlangga, Indonesia. This study implemented the basic principle ethics of respect, beneficence, nonmaleficence, and justice.

**Conflict of Interest:** The researchers reports no conflict of interest of this work.

**Source of Funding:** This research is done with individual money.

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Relationship between Working Period and Knowledge Level to the Prevention of Work Accident through Work Stress on Milled Kettle Workers in Sugar Factory of Rejo Agung Baru Madiun

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Abstract

Sugar factory labor was highly vulnerable to get work accident in work place. The objective of this research was to identify the relation between working period and knowledge level to the prevention of work accident through variable of work stress on mill and kettle workers. This research was quantitative in analytical observational method and cross sectional design. Total sample of research were 115 workers in the sugar mill and kettle at sugar factory of Rejo Agung Baru Madiun through total sampling. The research data was tested in SEM (Structural Equation Model) method by exerting instrument of Stata 13 to analyze the data. Based on the finding of research, on the sig value of working period 0.006 and sig value of knowledge level 0.023, it referred the relation in variable of working period through work stress, while no relation in variable of knowledge level through work stress to the prevention of work accident. Thus, it required to more stimulation to the knowledge level and more support to the workers in order to minimize their work stress.

Keywords: K3, Sugar Factory, Milled Kettle, Stress, Work Accident.

Introduction

Work accident is an unpredictable and unexpected situation by all workers which might occur, it is often unpredictable and cause to time and property loss, or even victim in the working world. This work accident is caused by a contact between energy sources as mechanical, chemical, physical, and kinetic which affect to injury on human, environment, or working tools. ISO 14001, 2004 has asserted that the work accident is defined as an incident which occurs on labor and causes to occupational illness, injury, or even death⁷.

Prevention of work accident can be implemented through strategies of work accident prevention which are addresses to working machine, environment, equipment and supplies as well as human factor. Environmental condition is needed to fulfill standards or safety and security, proper condition of work place according to the standard of work safety until the planning which needs extra attention to fulfill the safety standard¹⁰. The work accident also impacts to significant expense for the organization, employee, and even society in overall. The expense is varied based on lowest level up to the highest level, with the duration of sick leave because of work accident. The long duration of sick leave will impact to the organization, since the labor or employee will be less productive along that period of time. The sick leave of employee means that the organization must keep paying the salary along the leave period of employee (it appears to the expense proportionally over the work-days left). The alternative which can be implemented during employee’s leave is to look for the substitute as the part-time employee. However, this part-time employee must also be paid by the organization. This also might impact to the higher cost of expense in an organization, if the work accident is not minimized as good as possible³.

Working period is defined as a duration of employee to exert effort and time to the factory or organization as well as produce absorption from many kinds of...
human activity. The longer working period will make the employee have more experiences and be able to help the factory or organization to produce output and better performance. Working period can build skill of employee, so the work will be performed well. Therefore, the longer working period will identify better working skill of employee\[9\].

Knowledge is a result of knowing towards a particular object through five sense (eye, nose, ear, and other senses) or a production of human sensing. Naturally human sense produces knowledge which is very affected by the intensity of attention and perception on certain object. It mainly gotten through sense of hearing and sight\[6\].

Knowledge is mental components which has been resulted from whole process physically or connately which is derived from individual experience\[8\]. It is divided into several aspects, as 1) Know, as the reminder of subject which has been learned in the past. This level is considered as recall stage or re-remember on stimulus received. Thus, know is the lowest stage in the knowledge aspect, 2) Comprehension, as being able to explain well about particular object which is known as well as to interpret subject properly. It is also about to explain, mention, conclude, estimate the object which is being learned at that time, 3) Application, it aims to exert the subject as things that have been learned in the real situation or condition, 4) Analysis, the activity of information sorting into many parts or activities which examines and attempts to understand information, 5) Synthesis, an ability to put and relate parts within an overall form, or it is simply explained as the ability to arrange new formulation from some existing formulation, 6) Evaluation, where the individual has ability to value on particular object\[1\]. There are factors which can influence individual knowledge: age, educational level, working experience, up to the information which is obtained by the individual\[5\].

Work stress is a state of stress which impacts individual to have unbalanced psychological and physical condition that will influence the process of thinking, emotion, and condition of employee. The individual who often worries and feel nervous indicates signals of stressful individual, as a result, it will make the individual more aggressive, get angry frequently, unrelaxed condition, until uncooperative behavior towards the surrounding environment\[4\]. Generally, the phase of mild stress does not damage the individual or employee from their physiological aspect. The mild stress on individual in their daily life will make the employee be more alert and not cause to disease, next, the phase of severe stress, where the duration of severe stress is longer than the mild one. It can be in week or even years, thus, the severe stress can danger individual or employee. The example of severe stress is inharmonious relationship with family or partner of life, chronic disease, until financial difficulty. About responses which emerge from this severe stress are indigestion, asphyxia, tremor, and often feel confused or panic\[11\].

However, the stress can result positive things in the end, as calmness, high motivation, good perception, and high energy. Those responses also impact well to the employee as long as the stress management can be managed well, then, the task or work is finished well and relation with the surrounding goes well. On the other hand, if the individual response during work stress is negative, it will impact badly as decreased motivation, easy to get angry or offended, work absence, apathetic, easy to make mistake during working, and inability to take decision. Those negative impacts are very influential to the individual and their work environment. They are caused by the individual inability to manage the stress, so it cause problems among employees or even unfinished works\[12\].

The research is conducted on the milled kettle workers in sugar Factory of Rejo Agung Baru Madiun.

**Method**

This research was included into observational analytical research which exerted observational analytical method and aimed to identify the relation between knowledge level and working period to the prevention of work accident through variable of work stress. The researchers employed cross sectional research design on the total respondents 115 milled kettle workers in Sugar Factory of Rejo Agung Baru Madiun by using questionnaire sheets which have been valid and reliable to the variables of working period, knowledge level, work stress as well as prevention of work accident in questionnaire as the research instrument. Each variable questionnaire was consisted of 10 items for the knowledge level, 11 items for the work stress and 12 items for the prevention of work accident, while the working period was identified from standard of working period which has been determined by the organization. The research data was analyzed in SEM (Structural Equation Model) by exerting instrument of Stata 13.
Research Findings

1. Univariate Analysis

a. Working Period: Variable of working period was consisted of two categories: long working period and new working period. The 1st table would define the working period of milled kettle labor from the total respondents 103 workers where particularly 71 workers have long working period (62%), while 44 workers have new working period (38%).

<table>
<thead>
<tr>
<th>Working Period</th>
<th>Respondent (n)</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long</td>
<td>71</td>
<td>62</td>
</tr>
<tr>
<td>New</td>
<td>44</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td>115</td>
<td>100</td>
</tr>
</tbody>
</table>

b. Knowledge Level: Variable of knowledge level was divided into two categories, good and poor category. 2nd table would illustrate data distribution which gathered from 115 respondents, that 67 workers have good educational level (58%), while 48 workers have poor educational level (42%).

<table>
<thead>
<tr>
<th>Knowledge Level</th>
<th>Respondent (n)</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>67</td>
<td>58</td>
</tr>
<tr>
<td>Poor</td>
<td>48</td>
<td>42</td>
</tr>
<tr>
<td>Total</td>
<td>115</td>
<td>100</td>
</tr>
</tbody>
</table>

c. Work Stress: Variable of work stress was divided into two categories, as mild and severe stress, 3rd table would explain that from the total 115 respondents, 65 workers have mild work stress (57%), while 50 workers have severe work stress (50%).

<table>
<thead>
<tr>
<th>Work Stress</th>
<th>Respondent (n)</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>65</td>
<td>57</td>
</tr>
<tr>
<td>Severe</td>
<td>50</td>
<td>43</td>
</tr>
<tr>
<td>Total</td>
<td>115</td>
<td>100</td>
</tr>
</tbody>
</table>

d. Prevention of work Accident: Prevention of work accident on milled and kettle workers in Sugar Factory of Rejo Agung Baru Madiun illustrated that workers section have prevented towards work accident in about 63 respondents (55%), while 52 respondents (45%) have not been good in preventing work accident as it was illustrated on the following table:

<table>
<thead>
<tr>
<th>Prevention of Work Accident</th>
<th>Respondent (n)</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>63</td>
<td>55</td>
</tr>
<tr>
<td>Not good</td>
<td>52</td>
<td>45</td>
</tr>
<tr>
<td>Total</td>
<td>115</td>
<td>100</td>
</tr>
</tbody>
</table>

2. Multivariate Analysis: Path analysis test was aimed to identify indirect relation between independent variable and dependent variable through intervening variable. Further, path analysis in this research exerted pat analysis in logistic regression base. The software of Stata 13 was used to analyze the research data in this research, it resulted:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Log odd</th>
<th>Coefficient</th>
<th>S.E</th>
<th>Z</th>
<th>P Value</th>
<th>CI 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Stress (Working Period)</td>
<td>-1.2</td>
<td>-1.157</td>
<td>0.425</td>
<td>-2.72</td>
<td>0.006</td>
<td>-1.99 up to -0.32</td>
</tr>
<tr>
<td>Work Stress (Knowledge Level)</td>
<td>-0.76</td>
<td>-0.762</td>
<td>0.431</td>
<td>-1.77</td>
<td>0.077</td>
<td>-1.61 up to 0.08</td>
</tr>
<tr>
<td>Prevention of Work Accident</td>
<td>0.87</td>
<td>0.875</td>
<td>0.384</td>
<td>2.28</td>
<td>0.023</td>
<td>0.123 up to 1.63</td>
</tr>
</tbody>
</table>

5th table Table of Estimation Result: Negative relation between working period and work stress incident was indicated by the log odd coefficient in each score unit of working period variable that could reduce work stress in about 1.2 unit, and significant relation statistically (CI 95% = -1.99 up to -0.32; p value = 0.006). Relation between knowledge level and work stress incident was negative. Moreover, the log odd coefficient in each unit of knowledge could reduce the work stress in about 0.76 unit, and did not show any relation statistically (CI 95% = -1.61 up to 0.08; p value = 0.077). It referred to the positive relation between work stress and prevention of work accident. Log odd coefficient in each score unit of work stress could improve prevention of work accident in about 0.087 unit, and have significant relation statistically (CI 95% = 0.123 up to 1.63; p value = 0.023).
indirect relation of working period through variable of work stress to the prevention of work accident resulted value -1.044. This indirect relation from the variable of working period -1.044, where the path analysis on direct relation value between working period and work stress -1.2. Whereas, the knowledge level and prevention of work accident through work stress -0.66 from the calculation result (-0.76) x (0.87) = -0.66. It was not indicated to significant relation statistically on the level of knowledge, due to the p value of knowledge level was higher than p value 0.077 > 0.05.

Direct relation was the relation between independent variable and dependent variable except through intervening variable. The relation of total working period in prevention of work accident -1.044 through formula (-1.2) x (0.87) + 0 = -1.044, while for the knowledge level (-0.76) x (0.87) + 0 = -0.66. Value score is 0 was derived because of no indication of direct relation between variable of working period and knowledge level to the prevention of work accident.

**Discussion**

Work stress and working period resulted to negative relation to the prevention of work accident. The result of path analysis showed that on log odd coefficient in each score unit of working period was able to decrease work stress of employee in about 1.2 unit, where the long period of working could reduce the severe level of work stress, then, workers who have been in the long working period could minimize possibility of severe stress than workers in new working period. Globally, either new working period or long working period could rise to work stress, surrounding environment was also able to be the trigger of work stress from the physical and social environment condition, as well as work target demand of the factory or organization. Monotonous activity in working and age factor due to the long period of work could impact tired condition that raised to work stress[2]. The longer experience indicated that the workers have undergone critical periods during working in the factory or organization, which affected the labor to be more calm during working. Therefore, the prevention of work accident was better and profitable for both parties.

Knowledg level and work stress was not related to prevention of work accident. Log odd coefficient in each score unite of knowledge level could reduce the work stress in about 0.76 unit. The worker who have good knowledge level could decrease severe stress level than worker who have poor knowledge level, but it did not indicate to significant relation statistically in this research, since the p value of knowledge level (0.077) was higher than the p value (0.05). Knowledge level in this research was not related to work stress which referred that knowledge level should pass variable of attitude. Attitude could determine whether decision should be taken or not. In addition to knowledge level, if on the average, worker have good knowledge level but bad attitude, the attempt of work accident prevention would not be appropriate to purpose. Intervening variable in this research is work stress which no relation with prevention of work accident. Knowledge level did not have any relation, because it was possible that knowledge level of workers was only to know, but did not reach to the evaluation stage where workers should understand or comprehend about the prevention of work accident.

**Conclusions**

Working period in this research showed relation to prevention of work accident through variable of work stress, while knowledge level did not show to any relation to prevention of work accident through variable of work stress on milled and kettle workers in Sugar Factory of Rejo Agung Baru Madiun. Next, the work stress as intervening variable resulted about relation to the prevention of work accident on milled and kettle workers in Sugar Factory of Rejo Agung Baru Madiun. Furthermore, researchers suggested that the workers with long working period should share their experience to new workers and remind them to keep focusing on how to minimize about possibility of work accident. Workers were expected to follow acceleration system to equalize the educational level. Since, the higher level of education would result to more knowledge. Stress management was also needed for the workers, so the work stress and work accident could be minimized.

**Conflict of Interest:** Nothing

**Source of Funding:** Self

**Ethical Clearance:** This research has undergone ethical test in ethics commission of health research of Faculty of Dentistry, University of Jember in this following registration number 416/UN25.8/KEPK/DL/2019.
References

Prospective Comparative Study of the Effects of Clonidine and Moxonidine as Add on Therapy in Patients of Chronic Kidney Disease with Hypertension in a Tertiary Carecenter

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Abstract

Objectives: To compare the effects of clonidine and moxonidine as add on therapy in patients of chronic kidney disease with hypertension.

Method: It is an observational study of duration of one year. Patient who fall under the diagnostic criteria of chronic kidney disease with hypertension were selected randomly from those attending the routine medicine outpatient department and medicine ward at S.N. Medical College and associated hospital.

Result and Conclusion: Study shows a slightly greater reduction in various parameters of chronic kidney disease like systolic BP, diastolic BP, pulse rate, blood urea, and serum creatinine with moxonidine group than clonidine group. But statistically there was no significant difference was found in both groups.

Keywords: Chronic kidney disease, hypertension, moxinidine, clonidine.

Introduction

Hypertension is a “life time” condition and, if left untreated, leads to lethal complications. High blood pressure went from being the 4th leading risk factor in 1990 and 1st risk factor in 2010 as quantified by DALYs.¹ According to a WHO report on Global Status of Non-Communicable Diseases 2010, 33% of the adult Indian men and 30% of adult Indian women have high blood pressure, implying that one in every three adult Indian is hypertensive.² Hypertension is one of the cause of chronic kidney disease (CKD). Hypertension in CKD increases the risk of important adverse outcomes, including loss of kidney function and kidney failure, early development and accelerated progression of cardiovascular disease (CVD), and premature death. CKD is an internationally recognized public health problem affecting 5–10% of the world population.³⁴

Clonidine is classified as a centrally acting α₂ adrenergic agonist and imidazoline receptor agonist that has been in clinical use for over 40 years.⁵ Clonidine suppresses sympathetic outflow resulting in lower blood pressure, but sudden discontinuation can cause rebound hypertension due to a rebound increase in sympathetic outflow. Treatment of clonidine withdrawal hypertension depends on the severity of the condition.⁶ Moxonidine is widely approved central antihypertensive drug that acts primarily by reducing central sympathetic nervous system activity via activation of imidazoline I-1 receptors in the rostral ventro-lateral medulla (RVLM). It is an orally administered imidazoline compound with selective agonist activity at imidazoline I-1 receptors, for which it has affinity >30 fold than α-2 adrenoreceptors.⁷ Thus, the unique profile of moxonidine and clonidine...
provides an opportunity to simultaneously cover a large number of factors crucially involved in the pathophysiology of the Chronic kidney disease associated with elevated blood pressure.

**Aim:** To compare the effects of clonidine and moxonidine as add on therapy in patients of chronic kidney disease with hypertension.

**Objectives:**
1. To study the efficacy and safety of clonidine and moxonidine in chronic kidney disease with hypertension.
2. To compare the efficacy and safety of clonidine and moxonidine during the study period.

**Material and Method**

Patient who fall under the diagnostic criteria of chronic kidney disease with hypertension were selected randomly from those attending the routine medicine outpatient department and medicine ward at S.N. Medical College and associated hospital after having taken approval from institutional ethical committee. It is an observational study of duration of one year. Informed consent was taken from all patients and strict compliance of prescription was ensured during the study.

**Inclusion Criteria:** Patients of either sex with following parameter:
1. Patients age >30 years and <60 years.
2. Patient who were diagnosed of chronic kidney disease by biopsy, USG, GFR or DMSA scan.
3. Patients whose systolic blood pressure is ≥ 140 mmHg or diastolic blood pressure is ≥ 90 mmHg

**Exclusion Criteria:**
1. Patients age <30 years and >60 years.
2. Patient who were not diagnosed of chronic kidney disease by biopsy, USG, GFR or DMSA scan.
3. Patients whose systolic blood pressure is <140 mmHg or diastolic blood pressure is <90 mmHg.

4. Patients who require renal transplant (Grade-5 CKD).

**Drugs:** Clonidine, Moxonidine

In this study patients were selected randomly on the basis of inclusion and exclusion criteria. These patients were already on standard treatment CCB(AMLODIPINE) +THIAZIDE DIURETICS+B BLOCKERS. Selected patients were divided randomly into two groups:

**Group-I:** Comprises 94 Chronic kidney disease patients with hypertension who were given Clonidine 0.1mg BD as add on therapy and dose was titrated to achieve target level along with their standard treatment.

**Group-II:** Comprises 87 Chronic kidney disease with hypertension who were given Moxonidine 0.2mg BD as add on therapy and dose were titrated to achieve target level along with their standard treatment.

Although study was started with 100 cases in each group but there was drop out of 6 cases in group A and 13 cases in group B after 8 weeks due to unknown reasons. These patients were excluded from the study.

**Observations:** One hundred eighty one cases of chronic kidney disease with hypertension attending Medicine OPD, and admitted in Medical wards in post graduate Department of Medicine, S.N. Medical College& hospital Agra, fulfilling the inclusion criteria constituted the material for the present study.

Overall incidence of distribution of cases is maximum in 41-50 years, followed by 30-40 years and least no of cases in 51-60 years. Youngest person in this study was 31 years and oldest person in this study was 58 years.

In group-I the male/female ratio was 1.3:1, and in group- II the male/female ratio was 1.48:1. This could be due to a larger number of male being treated.
Table 1: Systolic blood pressure values (mmHg) before and after treatment

<table>
<thead>
<tr>
<th></th>
<th>Group I (n =94)</th>
<th></th>
<th>Group II (n=87)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before treatment</td>
<td>After treatment</td>
<td>Before treatment</td>
</tr>
<tr>
<td></td>
<td>4wk 8wk 12wk</td>
<td>4wk 8wk 12wk</td>
<td>4wk 8wk 12wk</td>
</tr>
<tr>
<td>Mean</td>
<td>173.43 166.87 164.57 159.43</td>
<td>171.29 166.87 161.47 155.06</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>14.81 16.57 13.35 11.92</td>
<td>20.17 16.57 14.49 15.03</td>
<td></td>
</tr>
<tr>
<td>T value</td>
<td>2.8619 1.048 2.7855</td>
<td>1.5426 2.235 2.7972</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>0.0047 0.2961 0.0059</td>
<td>0.1249 0.0268 0.0058</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 illustrates the baseline value of systolic blood pressure before and after 4 weeks, 8 weeks and 12 weeks of therapy in group I and group II. With clonidine therapy fall in systolic BP was statistically significant at 4 week in group I (t=2.8619, p< 0.01) insignificant thereafter. With moxonidine therapy, the fall in systolic BP was statistically insignificant at 4 weeks (t=1.542, p>0.05), but was significant at 8 weeks (t=2.235, p<0.05) and 12 weeks (t=2.797, p<0.05).

Table 2: Diastolic blood pressure values (mmHg) before and after treatment

<table>
<thead>
<tr>
<th></th>
<th>Group I (n =94)</th>
<th></th>
<th>Group II (n=87)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before treatment</td>
<td>After treatment</td>
<td>Before treatment</td>
</tr>
<tr>
<td></td>
<td>4wk 8wk 12wk</td>
<td>4wk 8wk 12wk</td>
<td>4wk 8wk 12wk</td>
</tr>
<tr>
<td>Mean</td>
<td>99.09 95.19 91 87.79</td>
<td>99.36 96.02 92.23 87.79</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>6.67 6.49 6.73 6.44</td>
<td>8.93 9.58 8.39 6.44</td>
<td></td>
</tr>
<tr>
<td>% change baseline</td>
<td>-3.94 -4.40 -7.77</td>
<td>-3.36 -3.95 -8.57</td>
<td></td>
</tr>
<tr>
<td>T value</td>
<td>4.063 4.345 3.3411</td>
<td>2.3234 2.7114 3.6415</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>0.0001 0.0001 0.001</td>
<td>0.0214 0.0074 0.0004</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 illustrates the mean baseline value of Diastolic blood pressure before and after 4 weeks, 8 weeks and 12 weeks of therapy in group I and group II. With both clonidine and moxonidine therapy, decrease in diastolic BP was statistically significant at all time intervals.

Table 3: Pulse rate (BEATS/min) CHANGE before and after treatment

<table>
<thead>
<tr>
<th></th>
<th>Group I (n =94)</th>
<th></th>
<th>Group II (n=87)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before treatment</td>
<td>After treatment</td>
<td>Before treatment</td>
</tr>
<tr>
<td></td>
<td>4wk 8wk 12wk</td>
<td>4wk 8wk 12wk</td>
<td>4wk 8wk 12wk</td>
</tr>
<tr>
<td>Mean</td>
<td>84.13 85.98 84.04 83.72</td>
<td>84.37 85.11 84.11 83.44</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>7.94 6.9 5.65 5.49</td>
<td>8.90 5.05 4.26 5.18</td>
<td></td>
</tr>
<tr>
<td>% change baseline</td>
<td>+0.37 -0.40 -0.71</td>
<td>+0.23 -0.34 -0.28</td>
<td></td>
</tr>
<tr>
<td>T value</td>
<td>1.0599 2.1091 0.3938</td>
<td>1.8134 0.976 2.9825</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>0.2906 0.161 0.6942</td>
<td>0.217 0.3305 0.3301</td>
<td></td>
</tr>
</tbody>
</table>
Table 3 illustrates the baseline value of pulse rate before and after 4 weeks, 8 weeks and 12 weeks of therapy in group I and group II. With both clonidine and moxonidine therapy, there was an increase in pulse rate which was statistically insignificant at all time intervals.

Table 4: Blood urea (mg/dl) level before and after treatment

<table>
<thead>
<tr>
<th></th>
<th>Group I (n =94)</th>
<th></th>
<th></th>
<th></th>
<th>Group II (n=87)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before</td>
<td>After</td>
<td></td>
<td></td>
<td>Before</td>
<td>After</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>treatment</td>
<td>4wk</td>
<td>8wk</td>
<td>12wk</td>
<td>treatment</td>
<td>4wk</td>
<td>8wk</td>
<td>12wk</td>
</tr>
<tr>
<td>Mean</td>
<td>165.61</td>
<td>153.94</td>
<td>138.8</td>
<td>138.04</td>
<td>165.22</td>
<td>153.27</td>
<td>138.59</td>
<td>132.29</td>
</tr>
<tr>
<td>SD</td>
<td>31.68</td>
<td>24.91</td>
<td>17.69</td>
<td>19.78</td>
<td>34.49</td>
<td>25.59</td>
<td>17.48</td>
<td>16.89</td>
</tr>
<tr>
<td>% change baseline</td>
<td>-7.05</td>
<td>-9.84</td>
<td>-0.55</td>
<td></td>
<td>-7.23</td>
<td>-9.58</td>
<td>-4.55</td>
<td></td>
</tr>
<tr>
<td>T value</td>
<td>2.8075</td>
<td>4.8045</td>
<td>0.2777</td>
<td></td>
<td>2.535</td>
<td>4.3156</td>
<td>2.3613</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>0.0056</td>
<td>0.0001</td>
<td>0.7816</td>
<td></td>
<td>0.0123</td>
<td>0.0001</td>
<td>0.0194</td>
<td></td>
</tr>
</tbody>
</table>

Table -4 illustrates the mean baseline value of blood urea before and after 4 weeks, 8 weeks and 12 weeks of therapy in group I and group II. There was a decrease in blood urea in both groups. In group I, the decrease however was significant at 4 weeks (t=2.8075, p<0.05) and 8 weeks (t=4.8045, p<0.05) and was insignificant at 12 weeks (t=0.2777, p>0.05). The decrease in blood urea level was significant at all intervals in group II.

Table 5: Serum creatinine (mg/dl) level before and after treatment

<table>
<thead>
<tr>
<th></th>
<th>Group I (n =94)</th>
<th></th>
<th></th>
<th></th>
<th>Group II (n=87)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before</td>
<td>After</td>
<td></td>
<td></td>
<td>Before</td>
<td>After</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>treatment</td>
<td>4wk</td>
<td>8wk</td>
<td>12wk</td>
<td>treatment</td>
<td>4wk</td>
<td>8wk</td>
<td>12wk</td>
</tr>
<tr>
<td>Mean</td>
<td>11.04</td>
<td>10.31</td>
<td>9.84</td>
<td>9.69</td>
<td>11.24</td>
<td>10.65</td>
<td>9.91</td>
<td>9.45</td>
</tr>
<tr>
<td>SD</td>
<td>2.20</td>
<td>2.12</td>
<td>2.39</td>
<td>2.19</td>
<td>2.60</td>
<td>2.48</td>
<td>2.48</td>
<td>2.41</td>
</tr>
<tr>
<td>% change baseline</td>
<td>-6.61</td>
<td>-4.56</td>
<td>-1.52</td>
<td></td>
<td>-5.25</td>
<td>-6.95</td>
<td>-4.64</td>
<td></td>
</tr>
<tr>
<td>T value</td>
<td>2.3166</td>
<td>1.4263</td>
<td>0.4486</td>
<td></td>
<td>1.496</td>
<td>1.9222</td>
<td>1.2119</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>0.0216</td>
<td>0.1555</td>
<td>0.6542</td>
<td></td>
<td>0.1366</td>
<td>0.563</td>
<td>0.2273</td>
<td></td>
</tr>
</tbody>
</table>

P value at 12 weeks, Group- I Vs Group-II P>0.05

Table 5- Illustrates the mean baseline value of serum creatinine value before and after 4, 8, and 12 weeks of treatment. Serum creatinine value decreases in both groups. However in group I, the decrease in serum creatinine was significant at 4 weeks (t=2.3166, p<0.05) and was insignificant at 8 weeks (t=1.4263, p=0.05) and 12 weeks (t= 0.4486, p>0.05) and in group II, it was insignificant at all intervals.

Table 6: Side effects comparison in both groups

<table>
<thead>
<tr>
<th>Side effects</th>
<th>Clonidine v(N=94)</th>
<th></th>
<th></th>
<th>Moxonidine (N=87)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry mouth</td>
<td>63</td>
<td>67.02</td>
<td>27</td>
<td>32.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedation</td>
<td>75</td>
<td>79.79</td>
<td>51</td>
<td>61.45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Side effects | Clonidine (N=94) | Moxonidine (N=87)
---|---|---
| No. | % | No. | % |
Dizziness | 51 | 54.26 | 36 | 43.37 |
Tiredness | 15 | 15.96 | 24 | 28.92 |
Headache | 24 | 25.53 | 12 | 14.46 |
Pallor | 15 | 15.96 | 18 | 21.69 |

Table 6 demonstrates the most commonly seen side effect was sedation in both groups. Other side effects were more common in group I as compared to that seen in group II.

**DISCUSSION:** The prevalence of chronic kidney disease has been increasing worldwide during the past years and is reaching epidemic proportion in industrialized countries. This problem represents an enormous burden on health care systems and most importantly, the quality of the affected individuals is substantially lowered. Even though extensive research and public awareness efforts have been made over the previous decades the proportion of people affected is still rising. Chronic kidney disease (CKD) is an important source of long term morbidity and mortality. It has been estimated that CKD affects more than 20 million people in the United States. Most patients were asymptomatic until the disease had significantly progressed, they remain unaware of the condition. Thus it is essential to have clinical practice guidelines aimed at early detection, evaluation, diagnosis and treatment of this condition. Hypertension was found in approx. 80% of the chronic kidney disease patients. Treatment of hypertension significantly reduces the progression of chronic kidney disease.

**Clonidine therapy (Group-I):** In clonidine therapy (group-I) there was significant reduction in mean systolic blood pressure and mean diastolic blood pressure. Our finding are similar to those of G. J. A. MACPHEE (1992) and V. Planitz (1984) who observed significant reduction in systolic blood pressure and diastolic blood pressure9,10. With clonidine therapy there was insignificant change in mean pulse rate while V. Planitz (1984) crossover comparison study found that there was no significant change in pulse rate after clonidine therapy10. After clonidine treatment major side effects observed are dry mouth and sedation and tiredness. V. Planitz (1984) observed that out of 20 hypertensive patients treated with clonidine 17 patients complained of dry mouth and tiredness10.

**Moxonidine therapy (group-II):** In moxonidine therapy (group-II) there was significant reduction in mean systolic blood pressure and mean diastolic blood pressure. Our finding are similar to those of G. J. A. MACPHEE (1992) and V. Planitz (1984) who observed significant reduction in systolic blood pressure and diastolic blood pressure9,10. With moxonidine therapy, there was insignificant change in mean pulse rate. These findings concurred with the observation of V. Planitz (1984)10. Our study demonstrate that the decrease the mean baseline value of serum creatinine, however V. Planitz (1984) observed that there was no significant change in s. creatinine level after moxonidine treatment10. After moxonidine treatment main adverse effect was sedation, tiredness, pallor and dry mouth. Planitz, V. et. al. (1987) reported that moxonidine produces a hypotensive response similar to that of clonidine, at an equivalent dose, but with a significant reduction in adverse effects particularly sedation and xerostomia11.

**Conclusion**

Study shows a slightly greater reduction in various parameters of chronic kidney disease like systolic BP, diastolic BP, pulse rate, blood urea, and serum creatinine with moxonidine group than clonidine group. Side effects like dry mouth, sedation, dizziness, and headache are more common with clonidine group than moxonidine group. Moxonidine was better tolerated by patients.

**Conflict of Interest:** There is no conflict of interest.

**Funding:** Self.

**References**


Viability Test of the Gourami Scales Collagen Extract (Osphronemus Goramy) on the Human Gingival Fibroblast Cells

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Abstract

Background: Periodontal disease is a pathological inflammatory condition of the periodontal tissues which surround the teeth, including Human Gingival Fibroblasts (HGF). HGF regeneration is through the accelerating proliferation of tissue engineering therapy needs. Generally, the tissue engineering uses regenerative materials from cow or pig as the therapies, but these materials have some flaws. Thereby, this research aims to find the alternative materials regenerative tissue engineering scaffold collagen type 1 derived from the gourami fish scales. This research is also conducted to test the viability of fish scales collagen gourami against the Human Gingival Fibroblasts for 24 hours.

Objective: To determine the concentration of fish scale collagen gourami which can maintain the viability of human gingival fibroblast cells for 24 hours.

Method: HGF is taken from the healthy gingiva and planted in 96 well plates. Fish scales collagen gourami with a concentration of 0.32 mg/ml, 0.16 mg/ml, 0.04 mg/ml, 0.02 mg/ml and 0.01 mg/ml were added to each well and incubated during 24 hours. MTT Assay is performed to see the viability of fibroblast cells.

Results: The viability of HGF were increased after the addition of fish scales collagen gourami on the concentration 0.32 mg/ml until 0.01 mg/ml. The viability of the cells after the addition of fish scale collagen gourami was shown above 100%.

Conclusion: Fish scales collagen gourami has the potential in tissue engineering and the concentration of 0.01 mg/ml shows the highest viability of HGF.

Keywords: Collagen extract, gourami scales, human gingival fibroblast cells, MTT assay, viability.

Introduction

Periodontitis is an inflammation caused by infection of the supporting tissues of the teeth, progressive damage to the periodontal ligament, and alveolar bone. This disease is caused by the induction 90% of facultative anaerobic bacteria and 75% of negative bacteria. Fibroblasts are stem cells that play a role in forming and placing fibers in the matrix, especially collagen fibers. These cells secrete small tropocollagen molecules that combine in the basic substance to form collagen fibers. Periodontal disease is a dental and oral disease with a high prevalence rate. It is also a disease in the oral cavity that affects almost all humans in the world as well as reaches 50% of the adult population.

Engineering tissue technology is needed to
accelerate the regeneration and healing of periodontal tissue. The tissue engineering approaches to bone and periodontal regeneration combines three key elements to improve the regeneration, namely progenitor cells, scaffold or supporting matrix, and molecular signal (growth factor). Scaffold serves to provide structure and substrate for the tissue growth and will be degraded after that healthy tissue grows. Cells are needed as inductors of cells (fibroblasts) for adhesion, regeneration, and differentiation from the primitive cells to the specific ones needed in the scaffold to form a healthy new tissue. Growth factor functions for biophysical stimuli and keeps cell growth and differentiation in the scaffold.

Fish can be used as raw material to produce collagen. Collagen sourced from the skin, and fish bones has a smaller molecular structure compared to collagen made from cows or pigs, so it is easier to absorb. Collagen from the fish scales is derivative collagen from fish, and extracted from the fish scales. Therefore, there is no need to worry about mammalian diseases, such as mad cow disease or bird flu virus. Based on research of Nagai et al., (2004), there are components of fish scales including 70% water, 27% protein, 1% fat, and 2% ash. Organic compounds consist of 40-90% in the fish scales, while the rest are collagen.

Viability is the ability of a cell to survive. The viability test was determined by 3- (4,5-Dimethylthiazol-2-yl) -2,5-diphenyl-tetrazoliumbromide) MTT. This study aimed to determine the concentration of fish scale collagen gourami which can maintain the viability of human gingival fibroblast cells for 24 hours. Human gingival fibroblast cells were used because fibroblast cells were the most important cells in human periodontal tissue.

Material and Method

This type of research is a laboratory experiment with the design of The Post-Test Only control group design. This research was conducted in the Stem Cell Research and Development Center, Airlangga University and the hemical engineering laboratory, Politeknik Negeri Malang.

The tools and materials used are 200μl micropipette, small test tube, used tube, 96-well plate, cone tube, yellow tip and blue tip, ELISA reader, tweezers, petri dish, incubator, tissue, aluminum foil. Saline phosphate buffer (PBS) 10%, complete media (MK) (α-MEM 500 mL, FBS 10%, Penicillin, Streptomycin 2%, fungizone 0.5%), DMSO 7.5 mL, MTT 5 mg/mL PBS (50 mg MTT and 10 mL PBS), 10% SDS in 0.1 N HCl, Gourami scales, Human Gingival Fibroblast Cells (HGF), and 10% bovine serum albumin (FBS), Tripsin 0.25% as much as 2 mL, Aquades.

The Making of Gourami Scale Collagen Extract:
The addition of chelanting agent (EDTA) 1 N for the decalcification process as well as the addition of 0.5 M acetic acid (acid solubility collagen) are conducted. The next one is the addition of pepsin (pepsin solubility collagen) 0.1 gr. Stirred it with an ultrasonic device at 4°C for 18 hours, and then filtered it. The addition of 0.5 M NaCl was then conducted by centrifugation in the small tubes with a speed of 4000 rpm. Afterward, washed with distilled water and then removed (salting out) it. The lyophilization process with a freeze dryer to remove the water with a condenser temperature of -76°C and ambient temperature of 23.6°C for 12 hours until the water runs out.

The Stage of Fibroblast Cell Management:
The gingival tissue was washed for 3 times with PBS containing penicillin and streptomycin antibiotics in order to avoid the possibility of bacterial contamination. Afterward, it was cut to approximately 1mm3 and covered with deckglass. The collagenase was added later on for 30 minutes at 37°C. The tissue was then washed and centrifuged for 6 minutes. The cells obtained were cultured with a growing and incubated medium in a 5% CO2 incubator with a temperature of 37°C for 3 days. Moreover, it was observed every day until the cells are confluent. In addition, the culture medium is replaced every three days until the cell is confluent and passages are performed.

The Stage of Fibroblast Cell Culture:
Primary human gingival fibroblast cell culture in the Alpha Modified Eagle’s Medium (αMEM). Culture was added with 150 µg/ml Fetal Bovine Serum (FBS) 10%, 10 µg/ml Fungizone 0.5%, 100 µg/ml 2% Citrate. Afterward, the confluent cells dipasase to be propagated. The cell medium is removed and washed with PBS. The next one, that cell is released with a 2 ml trypsin enzyme and incubated safely 5 minutes at 37°C and 5% CO2. After that cell is removed, then added a stopper and resuspended, centrifuged 25000 rpm for 6 minutes. Finally, pellets are planted on a 10 cm plate with αMEM medium.

Harvesting Cells: The human gingival fibroblast
cells were taken from CO₂ incubators and then cell conditions were observed (80% confluent cell cultures were used for harvesting). Those cells were harvested according to the harvest protocols. In addition, the cells are seen using a microscope. Finally, the container is tapped so that the cell is floating.

The Stage of Treatment and Readings: The microplate with concentrations of 0.32 mg/ml, 0.16 mg/ml, 0.04 mg/ml, 0.02 mg/ml, 0.01 mg/ml. The last microplate was filled with αMEM culture, Fetal Bovine Serum (FBS) 10% and Pen-Strep 2% as much as 100µL as media control, the next one, the microplate contained only human gingival fibroblast cell culture and αMEM culture because it is used as cell control. The microplate is removed from the incubator. The 20 µl of MTT solution are added to each and finally is well ready to be used.

Results

% life cells: According to the results of reading OD (Optical Density), the average results of the research shown in table 1 are as follows.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media Control</td>
<td>4</td>
<td>0.090</td>
</tr>
<tr>
<td>Cells Control</td>
<td>4</td>
<td>0.634</td>
</tr>
<tr>
<td>Concentration 0.32 mg/ml</td>
<td>4</td>
<td>0.721</td>
</tr>
<tr>
<td>Concentration 0.16 mg/ml</td>
<td>4</td>
<td>0.760</td>
</tr>
<tr>
<td>Concentration 0.04 mg/ml</td>
<td>4</td>
<td>0.766</td>
</tr>
<tr>
<td>Concentration 0.02 mg/ml</td>
<td>4</td>
<td>0.771</td>
</tr>
<tr>
<td>Concentration 0.01 mg/ml</td>
<td>4</td>
<td>0.840</td>
</tr>
</tbody>
</table>

Based on the results of the study, it can be seen that the average value of the absorbance of the cell control group for 24 hours is 0.634. The lowest absorbance of the extracts group of gourami scales collagen at a concentration of 0.32 mg/ml of 0.721. The average absorbance of the extracts group of gourami scales collagen was highest at a concentration of 0.01 mg/ml of 0.840.

Tables 2: Viability results in the treatment group gourami scale collagen extract for 24 hours.

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Percentage of Live Cells (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.32 mg/ml</td>
<td>115.97%</td>
</tr>
<tr>
<td>0.16 mg/ml</td>
<td>122.99%</td>
</tr>
<tr>
<td>0.04 mg/ml</td>
<td>124.23%</td>
</tr>
<tr>
<td>0.02 mg/ml</td>
<td>125.06%</td>
</tr>
<tr>
<td>0.01 mg/ml</td>
<td>137.82%</td>
</tr>
</tbody>
</table>

Statistical Analysis: It can be concluded that the data are normally distributed. Afterward, from the homogeneity testing using Levene’s Test with Sig. >0.05 can be concluded that the data is homogeneous. In addition, the statistical tests were carried out using ANOVA One Way at the significance level of Sig. <0.05 and significant differences were obtained. It then continued by performing multiple comparisons using post hoc test Tukey HSD which concluded that all groups had significant differences except the concentration group control cell against 0.16 mg/ml and 0.32 mg/ml.

Discussion

Periodontal tissue has many important constituent components, such as collagen and fibroblasts. Fibroblast cells function as producers of connective tissue. The coats produced by fibroblast cells include collagen fibers, reticulum fibers, oxytalan fibers, and elastic fibers. Fibroblast cells secrete large amounts of protein, such as collagen, and abnormal collagen deposition in which it is a feature of the scarring process involving TGF-β1 and PDGF as a migratory fibroblast medium. Fibroblast cells secrete cytokines and several growth factors (growth factors) which can stimulate cell proliferation and inhibit the process of differentiation.

Proliferation of fibroblasts can be accelerated by giving tissue engineering. Tissue engineering functions as returning, regenerating, maintaining, or improving defective or lost tissue function. One type of engineering tissue is scaffold. Scaffold is a porous solid biomaterial that functions as (1) promoter of interactions between cells and biomaterials; cell adhesion; extracellular matrix deposits; migration media and fibroblast cultures; as well as niches for stem cell proliferation (2) supplying gas for cell survival, proliferation, and cell differentiation, (3) can adjust to the rate of tissue regeneration, (4) and relieve the inflammation.
The basic principle is the work of mitochondrial enzymes in active cells that metabolize tetrazolium salts, so that the tetrazolium ring is broken down by the dehydrogenase enzyme which causes the tetrazolium to turn into an insoluble and purple formazan. The color change of tetrazolium salt is caused by a decrease in the metabolic activity of cells that form NADH or NADPH. This purple color will be measured by absorbance.

Statistically, the comparison of the cell control group with the concentration group of 0.04 mg/ml, 0.02 mg/ml and 0.01 mg/ml experienced a significant value. Meanwhile, the concentration of 0.32 mg/ml and 0.16 mg/ml did not have a significant value. This shows that the plateau effect occurs at exposure to concentrations of 0.16 mg/ml and 0.32 mg/ml, so that exposure to these concentrations does not significantly affect cell proliferation. The research data is in accordance with the loading-dose theory of drugs, namely the higher the dose given, the therapeutic effect on target cells is no better than the lower dose.

Scaffold composition consists of polymer poly (alpha-hydroxyl) which can be degraded in the body (PLA, PGA, PLGA) and natural polymers. Natural polymers are divided into proteins (collagen, silk, fibrinogen, elastic, creatine, or actin), polysaccharides (cellulose, amylose, dextran, chitosan (chitosan), and glycosaminoglycans), and polynucleotides (DNA and RNA).

Among the various types of scaffold that has been mentioned, collagen-based scaffold (mainly type I) is widely used. This is because it has more advantages than the other scaffold constituents both natural and synthetic, including those identical to the extracellular matrix, adaptable in various forms, biocompatible, having biodegradation power, increase proliferation, and trigger cell differentiation.

Fibrillar type I collagen was chosen because it is the gold standard in the formation of biomaterials and is a type of collagen that is widely found in the human body – 90%. The telopeptides found in the collagen scaffold can cause mild inflammatory reactions that can affect the regeneration process. Cells interact with scaffold through the Arg-Gly-Asp (RGD) ligand that is similar to the natural extracellular matrix on its surface. The biodegradation properties of collagen scaffold can trigger the restoration of tissue structure and function. The degradation of collagen scaffold based on the type I collagen to type III by MMP-9 will induce the attraction of chemotaxis from human fibroblasts.

Collagen derived from gourami scales can be an alternative material consideration for the tissue engineering because of its abundant collagen content and good biocompatibility.

Conclusion

Collagen extract of gourami scales was viable on Human Gingiva Fibroblast cells, with the highest yield of viability at a concentration of 0.01 mg/ml is 137.82%.

Acknowledgement: Praise the Almighty God for his mercy and grace, so the researchers can complete this research. The researchers are also grateful to Prof. Dr. Chiquita Prahasanti S., drg., Sp. Perio (K) as the main supervisor and NoerUlfah, drg., M.Kes., Sp. Perio (K) as a mentor as well as parties who have provided much assistance in making this research.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: This study was approved by Ethical Commission of Health Research Faculty of Medicine University of Airlangga.

Reference


Viability Test of Collagen Extract from Gouramy Scale (Oshpronemusgouramy) on Bone Marrow Mesenchymal Stem Cell Culture

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Abstract

Background: The role of type I collagen is as a matrix of extracellular proteins with characteristics of increased cell proliferation which directly affects the physiology and morphology of cells. Type 1 collagen can be obtained from fish scales. Thus, this research aimed to support engineering tissue used for the treatment of periodontal disease in the regenerative surgery by utilizing collagen derived from gouramy scales. As an initial step, the researchers wanted to conduct a study used collagen extract derived from gouramy scales (Oshpronemusgouramy) which was applied to bone marrow mesenchymal stem cell cultures to see viability in vitro.

Objective: To determine the viability of collagen from fish scales (Oshpronemusgouramy) to bone marrow mesenchymal stem cells. Method: Bone marrow mesenchymal stem cells are taken from mice and planted in 96 well plates. Collagen extracted from gouramy scales using the enzymatic method was dissolved in a condition medium with each concentration of 0.01 mg/ml, 0.02 mg/ml, 0.04 mg/ml, 0.16 mg/ml, 0.32 mg/ml was put into the well prepared and incubated for 24 hours for the MTT assay.

Result: Collagen from fish scales can increase the viability of bone marrow mesenchymal stem cells with a percentage above 90% and the highest viability concentration at 0.01 mg/ml. Conclusion: Collagen from fish scales is viable against bone marrow mesenchymal stem cells. Collagen scales of gouramy soaked in medium had the highest viability with an optimum dose of 0.01 mg/ml.

Keywords: Bone marrow mesenchymal stem cell, gouramy scales collagen, viability.

Introduction

The regenerative material used in the field of dentistry has grown rapidly now. Regeneration of periodontal tissue with regenerative materials is expected to work at the cellular level. Used of regenerative materials can trigger cell proliferation and differentiation that are useful for the development of various cells.

Type I collagen is as a matrix of extracellular proteins capable of increasing cell proliferation. Type 1 collagen can be obtained from fish scales. Fish scales contain components including 70% water, 27% protein, 1% fat, and 2% ash. Organic compounds consist of 40% -90% in fish scales and the rest are collagen.²-⁴

Gouramy (Oshpronemusgouramy) is one of the aquaculture products whose production increases every year⁵. The amount of gouramy consumption reached
33.89 kg/capita/year in 2012 and in 2013 it increased to 35.14 kg/capita/year. Zhang’s 2011 study showed collagen derived from freshwater fish scales was safer to use than collagen sourced from other materials such as cattle and pigs and collagen derived from freshwater fish scales containing high type 1 collagen. Hence, this research aimed to the development scaffold to support tissue engineering to treat periodontal disease in the regenerative field by utilizing collagen derived from carp scales. As an initial step, the researchers wanted to conduct a study using collagen extract derived from gouramy scales (Osphronemus gouramy) which was applied to bone marrow mesenchymal stem cell cultures to see viability in vitro.

Materials and Method

The extraction of gouramy fish scales into collagen was conducted at the Instrumental Analysis Laboratory of the State Polytechnic Chemical Engineering Department, Malang. Culture of bone marrow mesenchymal stem cell and viability tests conducted at the Stem Cell Institute of Tropical Disease Research and Development Center, Surabaya.

Collagen Extracted from Gouramy Fish Scales: Gouramy scales were washed with water and dried under the sun to dry. After that, soaked in 1 M NaOH solution, 4°C for 24 hours to remove non collagen protein. NaOH solution was replaced every 8 hours and occasionally stirring. Washing with distilled water was performed to neutralize the pH followed by immersion in isobutanol to remove fat and added chelating agent (EDTA) 1N for decalcification. Followed by the addition of acetic acid (acid solubility collagen) as much as 0.5 M and the addition of the enzyme pepsin (pepsin solubility collagen) as much as 0.1 gr, then stirred with an ultrasonic device at 4 °C. Then filtering, then added NaCl 0, 5 M, and centrifugation in small tubes with a speed of 4000 rpm, after that washed with distilled water and then disposed (salting out). The lyophilization process with a freeze dryer to remove the water content with a condenser temperature of -76 °C and ambient temperature of 23.6 °C for 12 hours until the water runs out. The results of collagen extract of carp scales are sterilized.

Preparation of Conditioned Medium: Collagen extract of gouramy scales was soaked in α-MEM medium for 24 hours.

MTT Assay Test on Bone Marrow Mesenchymal Stem Cell: Samples were calculated by using the Federer formula with 5 treatments, 1 cell control, 1 medium control, and 4 replications were obtained. The concentrations used in this study were 0.32 mg/ml, 0.16 mg/ml, 0.04 mg/ml, 0.02 mg/ml and 0.01 mg/ml. Microplate containing cells was incubated for 24 hours in a 5% CO₂ incubator at 37°C. Microplates were removed from the incubator, culture media and scales of gouramy were removed then cell cultures in well washed with PBS. In each well, 100 μL of MTT solution was added. Cells were incubated for 4 hours in a 5% CO₂ incubator at 37°C. After the incubation period was complete, discard the medium and sample. Then stop by giving DMSO to each well. The value of formazan optical density was read by using ELISA reader with a wavelength of 590 nm. The live cell percentage was calculated and the CD50 price was analyzed by SPSS. The reading results were converted into% by using the formula to determine the percentage of cell viability:

\[
\% \text{ of live cells} = \frac{\text{Treatment} + \text{Media} \times 100}{\text{Cell} + \text{Media}}
\]

Note:

\% of live cells = Percentage of live cell count after the test

Treatment = Optical density value of formazan in each sample after the test

Media = Optical density value of formazan on media

Cell = Optical density value of formazan on control cells.

Results

Table 1. Optical Density in the treatment group of gouramy scales collagen which was dissolved in the medium of conditions.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean OD ± SD</th>
<th>Viability ± SD (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Cell</td>
<td>4</td>
<td>0.787 ± 0.033451</td>
<td>100 ± 0.00642</td>
</tr>
<tr>
<td>0.01 mg/ml</td>
<td>4</td>
<td>0.902 ± 0.008386</td>
<td>116.502 ± 0.06263</td>
</tr>
<tr>
<td>0.02 mg/ml</td>
<td>4</td>
<td>0.882 ± 0.051046</td>
<td>113.632 ± 0.07160</td>
</tr>
<tr>
<td>0.04 mg/ml</td>
<td>4</td>
<td>0.858 ± 0.043432</td>
<td>110.188 ± 0.06837</td>
</tr>
<tr>
<td>0.16 mg/ml</td>
<td>4</td>
<td>0.837 ± 0.151168</td>
<td>107.175 ± 0.24156</td>
</tr>
<tr>
<td>0.32 mg/ml</td>
<td>4</td>
<td>0.739 ± 0.047455</td>
<td>93.184 ± 0.05863</td>
</tr>
</tbody>
</table>

The percentage of living cells reflects the value of cell viability in the sample. The increase in the number
of bone marrow mesenchymal stem cells was evidenced by the comparison of the average life percentage of the control sample group which is 100%.

1. If the value of Sig. > 0.05, then the data is normally distributed
2. If the value of Sig. < 0.05, then the data is not normally distributed

Table 2. The results of the normality test of the collagen extract treatment group soaked in the medium.

<table>
<thead>
<tr>
<th>Kolmogrof-SmirnovStatistic</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.289</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The following are the results of the normality test of each treatment group of collagen extract soaked in a medium that shows all groups have Sig. amounting to 0.000 which is less than 0.05 (p < 0.05) which means that all groups are not normally distributed.

Table 3. Test results of the homogeneity of the treatment group of collagen extract soaked in the medium

<table>
<thead>
<tr>
<th>Levene Statistic</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.789</td>
<td>0.003</td>
</tr>
</tbody>
</table>

Then a variance homogeneity test was conducted with Levene’s Test in the treatment group of collagen extract soaked in the medium obtained p = 0.003\(^8\). This shows that this data is not homogeneous because it does not meet p > 0.05.

Data is not normal and not homogeneous, then it is followed by the Kruskal-Wallis significance test.

Table 4. Kruskal-Wallis test results

<table>
<thead>
<tr>
<th>Group</th>
<th>P value</th>
<th>Alfa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collagen</td>
<td>0.005</td>
<td>0.05</td>
</tr>
</tbody>
</table>

P value was lower than the alpha significance level in all treatment groups, so there was a significant difference in concentration of one with the other concentrations.

Data analysis is continued by using Mann-Whitney Test to compare differences between concentration groups. Mann-Whitney Test statistical tests showed that there were significant differences between each medium control group with a concentration of 0.32 mg/ml, 0.16 mg/ml, 0.04 mg/ml, 0.02 mg/ml, 0, 01 mg/ml. Significant differences were also found in cell control and concentration of 0.04 mg/ml, cell control with a concentration of 0.01 mg/ml, concentration of 0.32
mg/ml with a concentration of 0.04 mg/ml, 0.02 mg/ml, 0.01 mg/ml. While the cell control group with 0.32 mg/ml, the cell control group with a concentration of 0.16 mg/ml, the cell control group with a concentration of 0.02 mg/ml, a concentration of 0.16 mg/ml with a concentration of 0.04 mg/ml, 0.02 mg/ml, 0.01 mg/ml, concentration of 0.04 mg/ml with a concentration of 0.02 mg/ml and 0.01 mg/ml, concentration of 0.02 mg/ml with a concentration of 0, 01 mg/ml, there is no significant difference.

**Discussion**

Collagen is a biopolymer that is well used in the field of tissue engineering and it have a high level of biodegradability. Since, its high biodegradability, scaffold does not only support, but will unite with cells has a biological function as a medium for attachment, migration and proliferation of cells that can increase viability without affecting gene expression.

The viability test aims to see the ability of cells to be able to live by showing cell responses in the short term and showing the ability of cells to survive from the process of apoptosis and necrosis triggered by the exposure of a material. The viability test in this study uses a culture of bone marrow mesenchymal stem cell which is part of an adult stem cell that is able to make copies of cells that are identical to themselves for a long time and proliferate and differentiate into mature cells with morphological characteristics and certain functions for bone formation.

Based on the results of this study, it appears in table 1 that the average absorbance value is higher than the average absorbance value of the cell control group. Bahi states that the absorbance value of the treatment group which is smaller than the absorbance value of the control group indicates that the cell’s ability to proliferate is low. If the absorbance produced is higher than the control, then the cell’s ability to proliferate is high, but if the level of proliferation is too high, so it will result in cell death due to the possibility of changes in cell morphology.

In this study, the concentration of 0.01 mg/ml had the highest percentage of living cells of 116.502% and at a concentration of 0.32 mg/ml the lowest percentage of living cells was 93.184%. The research data is in accordance with the theory of loading-dose on drugs, i.e. the higher the dose given, the therapeutic effect on target cells is no better than the lower dose. The absorbance obtained is influenced by several factors, including the type of solvent, pH, temperature, high electrolyte concentration, and the presence of intruders from external properties of fish that can survive at various water temperatures and pressures, making collagen extract of fish scales resistant to physical and chemical damage.

Collagen derived from gouramy scales consists of various amino acids, especially the amino acid glycine. Collagen bonds from collagen extract of carp scales induce procollagen formation and cell proliferation. The bonds that form type 1 collagen from gouramy scales consist of proline, lysine, glycine, and other amino acid components. Proline and lysine from type 1 collagen extract gouramy scales will form new collagen fibers.

Collagen extract is rich in amino acids glycine, proline, glutamic acid, and aspartic acid and various kinds of peptides. These components have the ability to actively regulate cell function. Glycine can regulate the proliferation and differentiation of progenitor cells, proline can induce differentiation of embryonic stem cells. Glycine, glutamic acid, and alanine can influence signal transduction in the differentiation of osteoblastic bone marrow stem cells.

Type 1 collagen taken from gouramy scales can improve cell viability as indicated by the MTT test. The results of this study are in accordance with the research conducted by Zhang et al (2011) which states that Nano-fibrous type 1 collagen can support the growth of mesenchymal stem cells and is used for tissue engineering, and collagen material obtained from fish scales is used as engineering tissue as a potential candidate for bone collagen-based graft. The conclusions of the results of this study are gouramy scales collagen soaked in the medium condition has good viability that is above 90%. It has the highest viability with an optimum dose of 0.01 mg/ml.

**Acknowledgement:** Praise the Almighty God for his mercy and grace, so the researchers can complete this research. The researchers are also grateful to Prof. Dr. Chiquita Prahasanti S., drg., Sp. Perio (K) as the main supervisor and NoerUlfah, drg., M.Kes., Sp. Perio (K) as a mentor as well as parties who have provided much assistance in making this research.

**Conflict of Interest:** Nil

**Source of Funding:** Self
Ethical Clearance: This study was approved by Ethical Commission of Health Research Faculty of Medicine University of Airlangga.

References


Mobile Phone Keeping Behavior among Working Women

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Abstract

Background: Recent alarming increase in breast cancer, especially in younger women, has been attributed to the increasing usage of mobile cellular phones and their placement in contact with the body especially the breast region. The bio-effects of high frequency electromagnetic radiations accompanied by thermal damage to the tissues play an important role in tumor initiation and progression.

Method: The study was carried out in 260 working women from Pondicherry. They were questioned about mobile phone keeping behavior using a three item questionnaire.

Results: Women involved in unskilled job kept their mobile phones more proximal to the breast region when compared to the women engaged in white collar job. However the duration of mobile phone usage was higher in the latter group.

Conclusion: Longitudinal studies to follow up the relationship between mobile phone keeping behavior and development of breast cancer need to be undertaken. Hence we propose researchers to ask for history about mobile phone keeping behavior while dealing with breast cancer patients.

Keywords: Breast, cancer, cellphone, keeping behavior, mobile phone.

Introduction

Globally mobile phone usage among the younger generation has increased drastically over the recent past with the number of subscribers crossing 725 million.¹ Radiowave and microwave radiations of frequency ranging between 0.1-300,000 MHz are used in radio communication, radio location centers and cellular phones.² Electromagnetic radiation from mobile cellular phones draw immense attention and its contribution as an environmental factor in the development of various health issues including breast cancer in young women is still a debatable issue. Some studies claim the direct thermal energy emitted from mobile phones to be the cause while a few other studies have reported non-thermal biological effects due to electromagnetic radiations to be responsible for the disease pathogenesis.³ Electromagnetic radiations emitted from mobile phones during signal transmission are generally high frequency.

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radiowaves. Extremely low frequency electromagnetic waves, emitted during battery discharge that occurs merely when the device power is switched on, may also be involved in carcinogenesis.\(^4\)

Understanding environmental and behavioral risk factors play an important role in identifying and preventing the increase in disease incidence. One such factor of concern is the increasing usage of mobile cellular phones and their placement in contact with the body especially the breast region.\(^3\) Breast cancer hits third in the list of common cancers worldwide. India along with China and United States contributes to about one-third of the global breast cancer disease burden.\(^5\) There exists a lacuna in the awareness of risk factors for developing breast cancer among the public. In most instances disease in young women less than 40 years of age seems to carry a genetic predisposition with positive family history of breast cancer. Sporadic occurrence of breast cancer is common among women in the post-menopausal age group without any family history. of late there appears a rise in the number of breast cancer cases under 40 years of age in the absence of family history.\(^5\) There has been over emphasis on the genetic factors causing breast cancer; however in reality, environmental and lifestyle factors do play a considerable and huge role in cancer pathogenesis. Even a small increase in the incidence of cancer due to mobile phone usage would be considered an issue of significant public health importance.\(^4\)

In India, most women culturally prefer to wear saree (a traditional dress) especially those working in fields or construction works. They are more prone to slip their mobile phones into their blouse. There exists a lacuna among Indian studies that explore the effect of keeping mobile phones in proximity to the breast region and the effects of electromagnetic radiations as a possible risk factor in the development of breast cancer.

**Aims and Objectives:**

1. To compare the difference in body region in contact with mobile phones between women engaged in white collar jobs and women engaged in unskilled jobs
2. To compare the duration of mobile phone usage between women engaged in white collar jobs and women engaged in unskilled jobs
3. To compare the duration of keeping mobile phone in contact with the body parts among women engaged in white collar jobs and women engaged in unskilled jobs

**Materials and Method**

The study was conducted in Puducherry, India, an old French territory between May 2019 and January 2020. The study was designed as across sectional comparative study among 260 women included from both urban and rural population. Women who possessed a mobile phone with them were recruited for the study using snow ball sampling technique. An informed consent was obtained from the participants in vernacular language.

**Questionnaire:** Those women who consented to participate in the study were administered a simple 3 item questionnaire to provide information regarding mobile phone keeping behavior and usage duration. The following items were presented in English/Local vernacular language (Tamil) based on the participant’s choice.

(i) In which region of your body do you keep your mobile phone when not using it for talking or texting or browsing?
(ii) How many minutes in a day do you use your mobile phone for talking or texting or browsing?
(iii) How many minutes in a day do you keep your mobile phone in contact with your body?

**Statistical analysis:** The categorical data were described as frequency and percentage [item (i)]. The data obtained as minutes per day was described as mean ± SD and comparison between groups were done using unparied t-test [items (ii) and (iii)].

**Results**

The mean age of women who participated in this study was 38.58 years. The women who were engaged in white collared jobs such as teaching, health care, clerical jobs reported that they keep their mobile phones in hand while not using it (53.4%), in contrast, the women engaged in unskilled jobs such as construction site workers, house maids and agricultural laborers slip their mobile phones in their blouses, near their breast (50%); and hip region (24.3%). Apart from the above mentioned body regions 41.4% women engaged in white collar job and 43.6% of women engaged in unskilled job reported that they keep their mobile phone in contact with the other regions of the body (Table 1).
Table 1: Frequency and percentage distribution of body region in contact with mobile phone while not using it

| Body region in contact with mobile phone | Type of work | White collared job (n=116) | | | Unskilled job (n=144) | | |
|-----------------------------------------|-------------|---------------------------|-------------|---------------------------|
|                                         |             | Frequency                  | Percentage  | Frequency                  | Percentage  |
| Hands                                   |             | 62                        | 53.4        | 3                         | 2.1         |
| Hip                                     |             | 5                         | 4.3         | 35                        | 24.3        |
| Near Breast                             |             | 1                         | 0.9         | 72                        | 50.0        |
| Others                                  |             | 48                        | 41.4        | 34                        | 23.6        |

When comparing the duration of mobile phone usage between white collared and unskilled workers, the former were found to use their mobile phones for 92.37 min per day while the latter used only 15.53 min per day. There was a statistically significant difference (p<0.001) found in the duration of mobile phone usage between the two groups (Table 2).

When the participants were asked “How long you keep your mobile phones with you while not using it?” women engaged in white collared job responded they keep about 495 min (8 hours) while unskilled workers keep their mobile phones for 327.52 min (5.5 hours). There was a statistically significant difference in duration of keeping the mobile phone with them (p<0.001).

Table 2: Comparison of duration of mobile phone usage and duration of mobile phone keeping among study participants

<table>
<thead>
<tr>
<th>Variable (min/day)</th>
<th>Groups</th>
<th>N</th>
<th>Mean ± SD</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile Phone usage</td>
<td>White collared job</td>
<td>116</td>
<td>92.37 ±30.97</td>
<td>0.000***</td>
</tr>
<tr>
<td></td>
<td>Unskilled job</td>
<td>144</td>
<td>15.63 ±13.46</td>
<td></td>
</tr>
<tr>
<td>Mobile Phone keeping</td>
<td>White collared job</td>
<td>116</td>
<td>495.00 ±50.59</td>
<td>0.000***</td>
</tr>
<tr>
<td></td>
<td>Unskilled job</td>
<td>144</td>
<td>327.92 ±66.53</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

The concern about mobile phone being involved in carcinogenesis is due to two reasons. One is the electromagnetic radiations emitted due to signal transmission and the other is thermogenic effect produced by the device. The cellphones with 2G support emit electromagnetic radiations in the range of 890-960 for Global system for mobile communications (GSM).\(^7\) 3G/4G supported mobile phones tend to emit higher EMR. Biological stress responses to these radiations have become an important public health concern.

The result of this study revealed that women engaged in white collar jobs preferred to keep their mobile phone proximal to hand and other regions. On the other hand, women who were engaged in unskilled job preferred to keep their mobile near their breast and hip without knowing the fact that proximity of cellphones to the body and their contact with breast tissue especially in young girls probably carry a high risk of tumourogenesis.

Human breast cancer cells when exposed to electromagnetic frequencies under laboratory conditions grow faster when compared to low environmental exposure.\(^3\) As per WHO/ICNIRP Environmental Health Criteria (1993) non-thermal intensity of microwaves can be considered to have weak biological influence.\(^8\) The international expert panel of IARC (International Agency for Research on Cancer in Lyon) concluded that non-thermal radiofrequency exposure is a possible...
carcinogen (group 2B) for humans.\textsuperscript{9} Bio-effects of high frequency EMR are accompanied by thermal damage to the tissues.\textsuperscript{4} Non-ionized electromagnetic radiations induced oxidative stress due to imbalance in free radical production and antioxidant protective mechanisms cause cell damage and apoptosis. Kahya et al observed a rise in cytosolic reactive free radicals accompanied by increase in enzyme caspases levels that are pro-apoptotic in breast cancer cell lines exposed to 900 MHz radiations. However the mechanism of EMR induced biological cell response is yet to be uncovered.\textsuperscript{10}

Mobile phones produce local heating effect emitting a total peak output power of about 2 watt contributing to an average specific absorption rate (SAR) of 2.0 W/Kg. SAR is a measure of rate of energy absorbed by the human body when exposed to a radio frequency (RF) electromagnetic field.\textsuperscript{11} Distribution of radio-frequency energy and SAR is non-homogenous inside the body for different organs and tissues leading to difference in propensity to develop DNA damage causing cancer. Moreover the absorption of EMR is proportional to the heat generated at the interphase of biological tissue in contact with mobile phone.\textsuperscript{4} This study also revealed that the duration of mobile use was different between white collared working women and women engaged in unskilled job hinting that white coloured women are more vulnerable to the ill effect of mobile phone. The duration of keeping mobile phone with them also showed that there was significant difference between two groups studied, white collared women carry the mobile phone with them for longer duration when compared to women engaged in unskilled job. A few studies concluded that mobile phone usage though likely to produces deleterious biological response, do not demonstrate statistical significant harmful changes.\textsuperscript{12,13} Though the biological responses largely depend on the duration and frequency of exposure to EMR emitted from mobile phones, inter-individual variations do occur commonly. Safety guidelines and regulations for exposure of wireless communication devices including mobile phones are fixed based on their thermal bioeffects, not considering non-thermal effects of electromagnetic radiations. Existing public safety standards remain unmatched with the adverse health outcomes due to radiofrequency radiations from mobile phones. Attempts to assess adverse outcomes from EMR lower than the existing public exposure safety limits need to be undertaken to prevent future health risks especially cancer. Curtailing the exposure to excessive handling and usage of mobile phones should be considered as a vital initial step towards reducing the risk of developing cancer and other health hazards. Cumulative absorption of electromagnetic energy depends greatly upon the cumulative hours of usage of mobile phones.\textsuperscript{9} A few investigators also expressed their opinion that EMR play a role in tumor initiation and progression. Tumor progression is aided by increase in tumor growth rate and inhibition of involution.\textsuperscript{14,15}

Controversies in the results obtained from previous studies however need to be addressed due to the short study period and recall bias among the participants. Mobile phones are relatively a new technology and demands future studies on long term exposure before conclusions can be drawn on their tumorigenic effect in humans. The long induction and latency period of carcinogenesis raises concern on accuracy of association between mobile phone usage and development of cancer.\textsuperscript{16}

\textbf{Future Persepectives:}

Many of the studies conducted in the past focus on the development of brain cancer with little emphasis of breast cancer and testicular cancer. Future studies should be designed to study the bioeffects of EMR on infertility and risk for developing breast cancer.

The urgent need for the present Indian scenario is preventive approach in the form of health information programs to promote safe usage of mobile phones even though the 10 years studies do not reveal any significant carcinogenic effect.\textsuperscript{17} This study is an eye opener intends to provide researchers in breast cancer to include mobile phone keeping behavior as a possible environmental risk factor in the development of breast cancer. Considering the long latency prior to overt appearance of cancer, immature conclusions that electromagnetic radiations from mobile cellular phones are not involved in breast cancer pathogenesis should be discarded. As retrospective studies may be accompanied by patient and interviewer bias to a larger extent, longitudinal studies should be undertaken to prove or disprove the association. Administration of health education to instill awareness among the public regarding hazards of excessive mobile phone usage and its contact with their body surface occupies prime importance.

\textbf{Limitations of the Study:} Details of the network 2G/3G/4G and the type of mobile phone were not questioned.
Ethical Clearance: Ethical clearance for the conduct of study was obtained from International center for psychological counseling and social research, Puducherry.

Source of Funding: Nil

Conflict of Interest: Nil

References


The Policy of Large-Scale Social Restriction (LSSR): Prevention Effort of COVID-19 and Community Compliance in Indonesia

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Abstract

Covid-19 prevention efforts in Indonesia are carried out through several policies taken by the Government. One of them is the policy of conducting Large-Scale Social Restriction (LSSR) for regions that meet the requirements. LSSR and other policies that require community participation and discipline. The case curve is still high. Many violations still occur. The easing discourse has been LSSR rolled out. The study was aimed at evaluating the picture of the impact of LSSR policies in efforts to prevent the spread of Covid-19 in Indonesia concerning current public discipline. The study was conducted with a descriptive approach that was carried out through a literature study. The type of data used was secondary data. The results found that the policies issued in the Covid-19 prevention efforts, both in the form of policies on physical distancing, the use of masks, washing hands, to LSSR, all were related and depended on the level of community discipline to carry out and obey them. But the reality in the field of discipline that occurs both personally and collectively was still at a low level and requires further support. So that this also has an impact on the increasing occurrence of Covid-19 cases in various regions, even though the area has implemented an LSSR policy. It could be concluded that community discipline was the key to success in preventing Covid-19. The LSSR policy can also be successful if the community was able to discipline it obediently.

Keywords: Large-Scale Social Restriction, Health Policy, Community Compliance, Preventive.

Introduction

Covid-19 is a new type of virus so that not many people know and understand how to handle it. In the current condition Covid-19 is not a virus that can be ignored. This group of viruses can cause disease in birds and mammals, including humans. In humans, Covid-19 causes infections of the respiratory tract. If seen from the symptoms, people will think only limited to the common symptoms of influenza, but according to analysis in the world of medicine this virus is quite dangerous and deadly¹.

At present, in 2020, the development of transmission of this virus is quite significant, its spread is worldwide and even all countries have felt its effects including Indonesia. The transmission of this massive virus makes the whole world uneasy. Even the WHO since January 2020 has declared the world into a global emergency related to this virus².

As the outbreak of the Covid-19 virus became more prevalent, the Government of Indonesia issued several types of policies to anticipate and reduce the number of sufferers. Among them is determining the status of
disaster emergency starting from 29 February 2020 to 29 May 2020 with a total time of 91 days. Besides, several health protocols have also been disseminated to be followed and implemented properly.

The steps in the health protocol that were delivered did indeed require the participation of the discipline of the community, including the application of physical distancing, the use of masks and always doing proper handwashing. This concept aims to break the chain of transmission. But apparently in the field, this concept is often not obeyed, so there are still many violations of this health protocol. As there are still many people who are clustered in physical activity both in markets, shopping centers, and in other public areas. Doing activities without using a mask, and not doing hand washing before and after doing activities.

The behavior of the community in responding to Covid-19 caused the spread of this virus to become more widespread and difficult to deal with, thus making the Legislative Body urge the Government to immediately form a National Team to deal with the centralized Coronavirus outbreak. So that new policies emerged to limit movement society, namely the Large-Scale Social Restriction (LSSR) policy, another version of the lockdown policy carried out by other countries in the world, which is adjusted to the conditions of the people in Indonesia. New policies and commitments for implementation are needed to produce positive results.

The implementation of the LSSR policy is based on Government Regulation Number 21 of 2020, which is an embodiment of Law Number 6 of 2018 concerning health quarantine. Some regions have received approval from the Ministry of Health to implement the policy. However, after it has been carried out in several places and sometimes, then an evaluation is conducted, there is a discourse to relax the LSSR policy. On the other hand, according to the University of Indonesia epidemiologist, Syahrizal Syarif, this easing should not have been carried out.

Based on the background, several questions arise that are the focus of the research, namely how to address public discipline related to the Covid-19 preventive health protocol in Indonesia? And how are the positive and negative impacts if LSSR eased on the efforts to prevent the spread of Covid-19 in Indonesia related to the current level of public discipline?

Material and Method

The method used in this research was the study of literature, which was the study of the object of research in the form of literary works, whether in the form of scientific journals, books, articles in the mass media, or statistical data. The literature would be used to examine research problems and how to deal with them. The nature of the study conducted was descriptive analysis which was to give a picture to the reader so that it could be a medium of public education. The type of data used was secondary data.

Findings:

The Covid-19 Case in Indonesia: Today the Government of Indonesia continues to make efforts to minimize people infected with Covid-19. Initially the government did not want to provide information related to the coronavirus that entered Indonesia. This was done to avoid public panic and also avoid issues that are not clear.

Regarding the development of Covid-19, the Government made several policies. The first policy, in the form of Physical Distancing health protocol. This is intended to prevent transmission from patient to non-patient through droplets or small splashes of mucus from the walls of the respiratory tract of someone who is sick when sneezing and coughing. For this reason, it is strongly recommended that you set the distance and do not conduct meetings or activities that gather large numbers of people so that there is a build-up or opportunities for people to intersect or be nearby can be avoided. Then the next policy is a health protocol that requires all people to carry out healthy and clean behavior by always washing their hands using soap or hand sanitizer both before and after carrying out activities related to others. Then the next policy related to the use of masks, both in the middle of a sick or healthy condition, which aims to reduce up to 70% of transmission through droplets.

Besides, there is also a policy regarding the Covid-19 virus inspection, which is hoped to be carried out on a massive scale and to cover the entire Indonesian population. Several kinds of inspection method are evaluated from its sensitivity, namely by using molecular method using PCR or immunoglobulin examination method as an initial screening test and can be carried out en masse. The purpose of this policy is to quickly find out the condition of the people exposed
to Covid-19 so that further isolation can be carried out, both independently and in health care facilities.

To date, the number of people who have confirmed positive for Covid-19 is increasing and the number of deaths is still being found. To avoid confusing news, the government is also preparing reports that can be accessed online by the public through the official website.

**Large-Scale Social Restriction (LSSR) as an alternative policy in Indonesia:** To prevent the spread of Covid-19 in Indonesia, the government finally decided to implement the Large-Scale Social Restriction (LSSR) on March 31, 2020. LSSR or which could be interpreted as partial lockdown or quarantine was one of the alternative interventions carried out by the Indonesian government after previously issuing policies related to health protocols that must be obeyed by the Indonesian people. This LSSR policy limits community mobility, one of which is by closing public areas such as schools and offices, to cut the spread of the SARS CoV-2 virus, the cause of Covid-19.

This LSSR policy is given by the Central Government (in this case the Ministry of Health’s approval) to the Regions whose applications are deemed to meet the requirements. The legal basis for implementing this LSSR is Government Regulation number 21 of 2020 which is the manifestation of Law number 6 of 2018 concerning health quarantine.

**The Discipline of the Indonesian Society:** During the Covid-19 pandemic, as now, every citizen is expected to survive and adjust to life patterns. Collective discipline and behavior guided by health protocols are needed when they are active, especially in the public sphere.

According to the Government Spokesperson for Handling Covid-19, Covid-19 can only be prevented by strong discipline and cooperation spirit carried out by all elements of society as a whole without interruption. This discipline is related to compliance with government recommendations and policies to reduce the risk of the spread of Covid-19 becoming more widespread.

According to the Big Indonesian Dictionary, discipline means the exercise of mind or character with the intention that all actions always obey the order, disciplined means to obey the provisions or rules according to applicable regulations. Discipline can not arise directly, it needs learning and gradual habituation until everything will be implemented spontaneously and become part of the soul. The application of discipline in society is important and needs to be fostered and enforced. Because discipline is the success capital of every activity. By upholding discipline in the community is one of the efforts to prepare people (the community), concerned so that they can develop their potential. With the theoretical discipline will be able to provide stimulation and encouragement so that they can become productive people.

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**Figure 1. Discipline Level**

Source: Masitoh, 2006
From Figure 1 it can be seen that forming a disciplined attitude in society is not easy. There is a need for learning or familiarity for every member of the community to be able to apply it. This attitude can be applied to start from someone since he was a child, namely through educators provided by parents or starting from the smallest environment, the family because the family environment has a central role in shaping the attitudes and behaviors of a person and the rest they will be formed or influenced by the environment that is around them namely the social environment of the wider community. The attitude of self-discipline based on awareness and because of a sense of caring and responsibility can certainly work well because it is not based on coercion from others. Discipline in each individual is what will form a collective discipline in the middle of society. People often have their own views, which are sometimes different from the perception of health workers.

Impact of LSSR Policy and Community Discipline Level: In several countries in the world, many lockdown policies have been revoked. Activities related to the public interest began to be held again. The economy was revived after a long dormant period.

The Indonesian government, who learned this, also felt that limiting the movement of the people would no longer be an effective policy, because this policy had an impact on many things. Even in several discussion sessions, the team leader of the National Covid-19 taskforce handling team stated that socially we will experience something new normal or have to adapt when we are active and working. Besides, the community is also required to avoid physical contact with others or avoid the crowd at work, as well as comply with existing protocols, such as health protocols. Still, according to him, this transformation is to organize life and new behavior, when the pandemic, which will then be carried forward in the future until the discovery of this vaccine for Covid-19.

However, this is less agreed by epidemiologists, according to the analysis of the epidemiologist curve in Indonesia it does not meet the standards, so it is difficult to do an assessment. Case curves that continue to show an increase should also be taken into consideration. If there is a discourse about the LSSR policy easing, some conditions must have been fulfilled, such as related to the number of cases, the shape of the epidemiologist curve, and the minimum number of examinations that must be performed on the Indonesian population.

Public discipline is also an important benchmark before the easing of the LSSR policy is rolled out. Disciplined society will be the main key to preventing the spread of Covid-19. The reality in the field, at some point, the accumulation of people is still often found, even becoming the national news headline, even though it is happening in areas that are being applied LSSR policy. Besides, according to the results of several social studies, people show that they act according to their desires and do not heed health protocols that the government calls for, such as not wearing masks, not washing hands, and still carrying out social activities that involve many people.

If this condition is not immediately corrected, this will be a time bomb against efforts to prevent the spread of Covid-19 which is touted by the government. Not wearing a mask as protection will cause droplets to spread easily from one person to another, which means that it will cause the affected person to become a carrier of the virus or even become a new sufferer. Not doing handwashing properly will also be a medium for massive viral growth. In addition to the absence of movement restrictions, the spread of viruses that have been carried by these undisciplined hosts can become more widespread across distances and boundaries. As a result it is not impossible to see a significant increase in the number of cases, especially in several key areas.

For this reason, if Covid-19’s prevention efforts are to be successful, the government should re-evaluate these conditions in the community, if necessary the community must do intensive coaching in advance, be prepared until it is fully ripe to apply the health protocol in a disciplined manner until collective discipline formed throughout all elements of society. Only after that, the discourse about the LSSR policy can be evaluated for its existence and success.

Conclusions

The essence of this paper is that discipline was the key to success in preventing the spread of Covid-19 in Indonesia. Personal discipline would shape the collective discipline, which would have a wide impact on society. This discipline also could not be done by only one component but requires cooperation and the willingness of all parties to participate.

The ongoing LSSR in several regions also has not shown significant results. Repeated evaluations still need to be made regarding their effectiveness. Community
participation in the implementation of LSSR was very necessary. LSSR which was implemented without any discipline from the community will take place without meaning.

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Conflict of Interests: Nil

Ethical Clearance: This study utilizes secondary data that has been published. So in conducting the study there is no need for ethical clearance.

References


The Effect of Vitamin D3 and its Relationship with the Level of White Blood Cells in Women Spontaneous Miscarriage Undergoing Intracytoplasmic Sperm Injection (ICSI) Technique

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Abstract

Women were studied undergoing ICSI for 84 who suffer non-pregnancy at the Fertility Center, Al-Sadr Medical Hospital in Najaf Governorate, Period between January 2019 and March 2020. WBC, Vitamin D3 and β-hCG were measured, The pregnant women was divided into (Pregnancy Group, and spontaneous miscarriage) and then demonstrate the immunological effect on pregnancy of women after ICSI technique.

Current results study showed a significant increase (p<0.05) in hormone level β-hCG is evidence of the presence of high success rates for pregnancy in women who performed operations IVF, where the success rate at the beginning of the matter reached 61.9%, after which it decreased to 33.3% after the first three months due to the occurrence of spontaneous miscarriage of pregnant women due to various immunological and physiological reasons, a positive correlation between the level of β-hCG and other parameters in the study (Vitamin D3 -WBC). Also The current results showed a significant decrease in a groups (pregnancy failure) and the group (spontaneous miscarriage) compared with the control group (continued pregnancy) in relation to the level of vitamin D3 Also, The current results showed a significant increase in (pregnancy failure) and (spontaneous miscarriage) compared with control groups (continuation of pregnancy) in relation WBC numbers, and the present study founds a negative relationship between the level of vitamin D3 and WBC.

Keywords: Miscarriage, ICSI technique, vitamin D3, white blood cells.

Introduction

Infertility is a widespread disease worldwide and it means “the inability of the spouses to achieve pregnancy within one year of marriage” and the estimated rate of infertility in the world is around 15-20%¹. In vitro fertilization, intracytoplasmic sperm injection (ICSI), and intrauterine insemination (IUI) be are the main method of assisted reproductive technology (ART). Found a several Various studies in recent years have indicated that occur risk factor for implantation failure of women after ICSI which may be immunological parameters or biochemical parameters may be affected on In ICSI results²,³.

Measuring hematological parameters is one of the factors that affect pregnancy and its effect because it is a reliable indicator, and it is a simple, fast, and effective test since increasing the number of leukocytes in the event that infection is not detected that leads to important damage ⁴,⁵. Several studies have reported that pregnancy
in sometimes accompanied by leukocytosis, but complete chain changes to the different types of cells responsible for this observed leukocytosis number has not been clearly identified in all studies related to pregnancy\textsuperscript{6,7}. White blood cells (WBCs) are an important part of the immune system in a pregnant woman’s body as high white blood cells for some reason during pregnancy may lead to spontaneous abortion due to increase infection in the urinary tract or immune system problems\textsuperscript{8,9}.

The most important source of vitamin D is the skin’s synthesis of vitamin B from ultraviolet B, and any process that reduces the entry of ultraviolet B photons into the skin will reduce the production of cholecalciferol (vitamin D-3). Melanin absorbs skin pigment with UVB photons and can reduce vitamin D-3 synthesis by\textgreater 90\%\textsuperscript{10,11}. Vitamin D also worsens in the winter months (November to March), when latitudes reach above 37 °C ultraviolet B radiation decreases to Earth and little or no vitamin D can be synthesized in the skin, as vitamin D plays a prominent role in Calcium and phosphorous stabilization, and its deficiency has been shown to increase the risk of osteoporosis, fractures, and muscle weakness\textsuperscript{12,13}. Also, female reproduction is a one of the areas in which the role of vitamin D has not been extensively examined. However, early evidence from basic research strongly indicates the potential role of vitamin D in human reproduction, especially women\textsuperscript{14,15}. It turns out that the effects of a lack of Vitamin D3 on pregnant women expose them to the problems of spontaneous abortion or premature birth due to failure of the placenta function, pre-eclampsia, gestational diabetes, bacterial vaginitis, and poor growth and development of the fetus and childhood, as preserving must be maintained at sufficient levels throughout the period Pregnancy\textsuperscript{16,17}. The aim of this study was to study the relationship of white blood cell count in pregnancy and its relationship to vitamin D3 for aborted women under ICSI.

### Materials and Method

This is this study in the laboratories of the Department of Biology, College of Science, University of Kufa, and in the Laboratory of Fertility Center in Sadr City Medical City in Najaf Governorate/Najaf Health Directorate/Ministry of Health/Iraq. Venous blood samples were taken from women at three times, the first stage 14 days after the right, the second stage after spontaneous abortion in the third trimester while the third stage for women who are pregnant continuously and using a needle and syringes is used once from each patient and observer. The β-hCG level and the vitamin D3 level were measured using the ELISA method and the white blood cell count was measured by the GENEX blood analyzer. The research was approved by the ethics review committees of Al-Sadr Education City and the College of Sciences at Kufa University.

### Statistical Analysis:

The popular statistical system (Graph Pad prism ver. 5) was adopted, and a one-way analysis of variance table - Anova method (by Tukey’s multi-comparative test) was used to compare the groups divided into the measured parameters. The results are expressed as (Mean ± Stander Error). Correlation coefficients were calculated to estimate the correlation between tags and parameters. Descriptive statistics and correlation coefficients were performed using mega stat (V10.12 version) for excel 2010 (18).

### Results

**Results of β- Human chorionic gonadotropin hormone test:** In this test showed found significant difference (p<0.05) between pregnant women which was 52 (4.24±0.25) and non- pregnant women (Implantation Failure) (2.56 ±0.10) which was 32 from women which undergoing intracytoplasmic sperm injection technique as shown in figure (1).
Figure (1): Result β-Human chorionic gonadotropin hormone test which differ between pregnant women which was 52 and non- pregnant women (Implantation Failure) which was 32 from women which undergoing intracytoplasmic sperm injection technique.

Results of White Blood Cell Count

In this test showed found significant difference (p<0.05) between Continuous pregnant women (control group) which was 28 women and non- pregnant women groups which was 56 from women which undergoing intracytoplasmic sperm injection technique (Implantation Failure (32) and found non significant difference with spontaneous miscarriage (24)) as shown in figure (2).
Pregnancy failure
Spontaneous miscarriage
Continued pregnancy

0
5000
10000
15000

9442.0 ± 473.79 N=32
13860 ± 4280.9 N=24
7765.1 ± 331.79 N=28

P value
0.2422

P value
0.0065 **
P value
0.1313

(*) mean indicates significant (p<0.05).

Figure (2): Results of White blood cell Count test which differ between Continuous pregnant women (control group) which was 28 women and non-pregnant women groups which was 56 from women which undergoing intracytoplasmic sperm injection technique (Implantation Failure (32) and spontaneous miscarriage (24)).

Results of Vitamin D3 test: In this test showed found significant difference (p<0.05) between Continuous pregnant women (control group) which was 28 women and non-pregnant women groups which was 56 from women which undergoing intracytoplasmic sperm injection technique (Implantation Failure (32) and spontaneous miscarriage (24)) as shown in figure (3).
Figure (3): Results of Vitamin D3 test which differ between Continuous pregnant women (control group) which was 28 women and non-pregnant women groups which was 56 from women which undergoing intracytoplasmic sperm injection technique (Implantation Failure (32) and spontaneous miscarriage (24)).

The correlation between Vitamin D3 with White blood cell count: The study showed the presence of a negative correlation between Vitamin D3 with White blood cell count Figure (4).

Figure (4): The correlation between Vitamin D3 with Wbc.
Discussion

The results of the current research showed a significant increase in the level of significance (p<0.05) in the level of the β- Human chorionic gonadotropin hormone, and the reason for this is that this hormone is evidence of the presence of pregnancy in women who underwent ICSI operations may be because it is excreted mainly from the placenta during the formation of the fetus and this study is consistent with what reached 19. in this regard and that the increase in the level of this hormone is evidence of high success rates of pregnancy for women who conducted ICSI operations, where the success rate initially reached 61.9%, after which it decreased to 33.3% after the first three months due to the occurrence of spontaneous abortions for women. Pregnant women for various immunological and physiological reasons, as this study indicated, and these results are consistent with what was reached20,21,22.

The results of the current study also showed a significant difference at the level of significance (p <0.05) between the groups (pregnancy failure - spontaneous abortion) compared to the control group (continuous pregnancy) in vitamin D3 level. Also, the current study showed a significant difference in the vitamin D3 level between the pregnancy group, and spontaneous abortion group, and perhaps the reason for this is that vitamin D3 has a major role in miscarriage in women because the lack of vitamin D3 leads to the accumulation of white blood cells in Capillaries in the utrine of women, which leads to a decrease in blood flow to the uterine layers which leads to a weakening of the uterine layer Which leads to uterine weakness in women, which leads to pregnancy failure or spontaneous abortion. This study is consistent with the findings of 25,26. And this result may be explained that is the reason for this is that pregnant women have a lowered white blood cells count level compared to abort women This may be because white blood cells count is evidence of the presence of infections in the genital and urinary tract as a result of the abortion process, where these results are consistent with what was reached 27,28. Where he explained the presence of a significant increase in white blood cells women abortifacients and pregnancy after a period when the failure of vaccination compared to non- spontaneous miscarriage women.

The current study also showed a negative correlation between the level of white blood cells, and vitamine D3 level perhaps the reason for this is that vitamin D3 has a major role in miscarriage in women because the lack of vitamin D3 leads to the accumulation of white blood cells in Capillaries in the utrine of women, and increase in the white blood cells which leads to a decrease in blood flow to the uterine layers which leads to a weakening of the uterine layer Which leads to uterine weakness in women, which leads to pregnancy failure or spontaneous abortion. This study is consistent with the findings of 29,30, where it was explained that a lack of vitamin D3 in pregnant women leads to an increase in the level of white blood cells as an immune reaction and thus leads to miscarriage as a result of the accumulation of these cells in the blood vessels, which leads to a lack of flow Blood to the womb and weak endometrium.

Conclusions

From the result of this study showed a positive effect between a deficiency of vitamin D3 and the chances of infection of pregnancy in women who underwent ICSI.

Ethical Clearance: Guidelines of the Ethical Committee of the human and animal Research at the university of kufa were followed, which conform to the recommendations on confidentiality and privacy of human samples were followed throughly.

Conflict of Interests: The authors declared they have no competing interests.
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Successful Rate of Stature Estimation Using Odontometric Parameter with Carrea’s Index in Mongoloid Population

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Abstract

Background: Stature estimation is one of the four pillars in the anthropological identification protocol. During this time, stature estimation uses long bones, but if no long bones are found, tooth dimensions begin to be examined as a tool in stature estimation.

Purpose: The aim of this study was to be able to determine the percentage of success in using tooth dimensions to estimate height in the Mongoloid population in Indonesia, using the Carrea’s Index method.

Method: The study was carried out by measuring the dimensions of arch and chord, then put into the Carrea formula, the results were compared with actual height, then calculated the frequency of predictions of success and non-success, compared to gender, and quadrant side of jaw.

Results: The results of predictions of success for both women and men on both sides of the mandibular were a successful prediction of 69.6% and a non-successful prediction of 30.4%. In each sex, the success rate was different for each side, without a statistically significant difference (right p value 0.186; left p value 0.713) using Chi-square test. The results of the Pearson Correlation Coefficient test have a positive correlation (p <0.05) indicating that there is a significant relationship between height and the results of height estimation obtained from tooth dimension measurements.

Conclusion: Based on the successful rate of the Carrea’s Index method in this study shows that the Carrea’s Index method can be used in the Mongoloid population in Indonesia as a tool for human identification.

Keywords: Anthropology, carrea’s index, forensic identification, odontology, stature estimation.

Introduction

Indonesia is the most disaster-prone country in the world according to data compiled by the United Nations Agency (UN) in the field of the International Strategy for Disaster Risk Reduction (UN-ISDR) because it is included in the five most populous countries in the world, so there are potentially many victims threatened the risk of loss of life in the event of a disaster¹. In addition, geographically Indonesia is an archipelago that crosses the equator and is included in the Eurasian Circum Pacific Ring of Fire and is located at the confluence of four tectonic plates namely the Asian Continent, the Continent Australia, the Indian Ocean, and the Pacific Ocean, so that they are potentially at the same time prone to disasters such as volcanic eruptions, earthquakes, tsunamis, floods, and landslides². Disasters can be caused by natural factors (natural disasters) and by human actions (man-made disasters), such as crime,
terrorism, transportation accidents. These disasters are undeniably caused many victims, both alive and dead.

Every person who has died and cannot be identified or without identity must take the forensic identification stage, as stated in article 118 paragraph (1) of Law no. 36 of 2009 concerning Health, which reads “Unknown bodies must be made an effort to identify”3. This identification process is something important because it involves medicolegal and human rights aspects4. Identification of individuals will be easy to do if visuals can be recognized, but in cases that cause death, often the individual’s body becomes difficult to recognize due to the trauma, such as being cut into pieces (mutilated), damaged by severe accidents for example in transportation accidents (Air Asia 2014, Zahro Express ship, deadly accident at Puncak 2017, Lion Air 2018), fragmented/crushed5, decayed6, burnt because of fire accident, bomb blast, or only human skeletal remains that left to identify.

Estimating body posture is an important step in reconstructive identification of skeletal remains or body remains that are difficult to recognize. In anthropology, height estimation can be obtained from various parts of the body7 and, most commonly, using long bones8. But in some cases, not all parts of human bones can be found, especially if only jaws and leftover teeth are found. So under these conditions, investigators and researchers began to pay attention to the estimation of height through the skull and tooth dimensions9. But until now, only a few studies have evaluated the possibility to estimate height through the dimensions of the tooth. The main consideration regarding the reason teeth can be used for height estimation is that no two individuals have identical teeth and there is a presumption in society that a person with high body posture has large dental dimensions and arches, as well as the nature of teeth that are resistant to changes in perimortem and post-mortem, so these characteristics make teeth have an important role in the process of individual identification10.

In an effort to examine the use of teeth to estimate height11, researchers from outside Indonesia, have conducted several studies using a variety of method using tooth dimensions as parameters (odontometric parameters), both using permanent maxillary teeth5,12–15, permanent mandibular teeth9,10,16,17, as well as a combination of maxillary and mandibular permanent teeth18, some have even examined using deciduous teeth19. Odontometric parameters that have been used include tooth length, crown length, mesiodistal width, labiolingual/buccolingual width, and relationship to facial measurements. In studies using maxillary permanent teeth parameters, the results show that the mesio-distal width of maxillary canines has a significant correlation with height12,15,20, however, with linear regression formula that varies depending on the population and sample. According to Yadav et al.’s research, the regression equation generated from odontometric parameters can be used as an additional approach to estimating body height if the bone extremity is not available, but only in the same specific population15. Interestingly, for mandibular permanent teeth parameters, some researchers used the same method using a formula called the Carrea’s Index9,10,16,17. Although the study was conducted in different populations, the significant results obtained are the same, namely Carrea’s Index method can be used to estimate the height in their population. Carrea’s Index method is a method that was discovered by Carrea in 1920, which uses the parameters of the mandibular anterior permanent teeth by measuring two dimensions namely arch and chord16. Based on previous research using the Carrea’s Index method the advantages of this method are easy and simple because the formula is already found, it can be used in normal and crowded tooth conditions, and because the measured dimensions are horizontal dimensions (mesiodistal width of teeth and dental arch), so they are not affected by changes in the vertical dimensions of teeth, for example, due to attrition, as well as due to local cultural rituals that change to condition of the tooth (for example, pangur). In addition, when observing the findings of cases in the field, the anatomical position of the mandibular anterior teeth crowns is behind the anterior maxillary teeth so that they are adequately protected from trauma and damage before and after death.

Because the Carrea’s Index method is based on the previous study, the accuracy of the results is good, namely above 70% used in some populations9,10,16, so in this study, the writer wants to examine the accuracy of the estimated height using the Carrea’s Index method on the Mongoloid population in Indonesia. It is hoped that later the results of this study can be an inspiration or further study to develop related method or other method in estimating body height using dental dimensions to support the process of identifying bodies in the forensic field in Indonesia in particular.
Materials and Method

This study is an observational analytic with a cross-sectional design. The subjects in this study are the Mongoloid population - the largest group found in Indonesia - who are clinical patients of the Orthodontic Residents in Orthodontic Residency Program (PPDGS), at Oral Medical Education Hospital (RSGM-P), Faculty of Dental Medicine, Airlangga University, over the past year, with the following inclusion criteria:

- The age range of patients is 21-25 years
- Complete mandibular anterior teeth
- There are no anatomical, morphological abnormalities or pathological conditions and healthy periodontal tissue.

The sampling technique uses a total sampling method. The total sample is 46 subjects with mandibular dental molds, with a sampling unit that is one side of the mandibular quadrant, so that the total number of samples was 92 samples (for the right and left quadrants). While the exclusion criteria for the sample in this study as follow:

- Not willing to be the subject of the study.
- Not getting approval from the treating dentist.
- Not from the Mongoloid population.
- Have a history of mandibular anterior restorative, crowded teeth, or diastema.
- Have a history of abnormalities related to growth, such as abnormalities in the number of teeth, tooth size and shape, tooth eruption time, and abnormalities in tooth structure.

Each subject has explained the intentions and procedures in this study, and each subject fills informed consent. This study has also received Ethical approval from the Ethics Committee of the Faculty of Dental Medicine, Airlangga University. The procedure of this study as follow:

1. **Actual body height (BH) measurement**: The subject was measured using a One Med stature meter with the subject standing upright in a horizontal plane, barefoot, in an anatomical position according to the Frankfurt field, holding the breath, aligning the posterior surface of the heel, hips, shoulders, and nape in the vertical plane. Height is recorded in the subject’s identity form. Measurements were made by one person, the author himself. For intra-examiner variability, the height measurements were repeated for 12 subjects.

2. **Arch and chord measurement**: Arch is the sum of mesiodistal widths of one side of the mandible anterior measured from the labial surface, while the chord is the distance between the mesial edge of the central incisors and the distal edge of the canines on the same side measured from the lingual surface. It was measured using a sliding caliper according to the Carrea’s Index in the mandibular mold for each side of the mandibular quadrant, then the measurement results are entered into the Carrea formula to determine the estimated minimum and maximum height. Calculation results in millimeters are then converted to centimeters. For intra-examiner variability, the arch and chord measurements were repeated on 12 sample.
**Carrea Formula:**

\[
\text{Max BH} = \frac{\text{arch (in mm)} \times 6 \times 3.1416 \times 100}{2}
\]

\[
\text{Min BH} = \frac{\text{chord (in mm)} \times 6 \times 3.1416 \times 100}{2}
\]

**Comparison of estimated results with actual BH:**

The Max BH and Min BH values are the estimated range of the subject’s height which will then be compared to the actual body height of the subject, with the following conditions:

- **Successful Prediction**: if the actual height measurement results are in the range between the estimated minimum height and maximum height measurements.
- **Unsuccessful Prediction**: if the actual height measurement results are not in the range between the measurement results of the estimated minimum height and maximum height.

Then the frequency of successful prediction and unsuccessful prediction in both men and women, both right and left side is calculated.

**Data analysis:** The proportion of accuracy is compared by sex, and the jaw quadrant side uses the Chi-square test. Carrea’s Index method reliability was tested with Pearson’s coefficient and Kappa Index to determine intra-examiner reliability. This study uses a 95% confidence level, with a p-value <0.05 considered statistically significant.

**Results**

In this study, according to the results of the intra-examiner test, obtained reliable results with a Kappa Index coefficient of 0.897, which means that there is a very strong consistency (coefficient value close to 1) between the first and second height measurements in 12 subjects and arch and chord dimension measurements of 12 mandibular mold by the authors. Based on the Kappa Index test, a significant p value was obtained at 0,000 using a 95% confidence interval, where a p value <0.05, so this indicates that there was significant consistency between the first and second measurements.

Descriptive statistics of gender-related subjects consisted of 38 women (82.6%) and 8 men (17.4%) so that the sample was 92 (for a total of 2 sides of the mandibular quadrant with 46 samples each).

**Table 1 The mean value of age, height, and estimated height (maximum and minimum).**

<table>
<thead>
<tr>
<th>Mean</th>
<th>Perempuan</th>
<th>Laki Laki</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kanaan</td>
<td>Kiri</td>
<td>Kanaan</td>
</tr>
<tr>
<td>Usia (th)</td>
<td>22 ± 1.16</td>
<td>22 ± 1.20</td>
<td>22 ± 1.16</td>
</tr>
<tr>
<td>Tinggi Badan (cm)</td>
<td>157.14 ± 7.48</td>
<td>167.53 ± 4.72</td>
<td>158.95 ± 8.68</td>
</tr>
<tr>
<td>Tinggi Badan Maksimum (cm)</td>
<td>166.39 ± 10.28</td>
<td>165.70 ± 10.26</td>
<td>166.90 ± 10.46</td>
</tr>
<tr>
<td>Tinggi Badan Minimum (cm)</td>
<td>150.95 ± 11.55</td>
<td>149.40 ± 11.61</td>
<td>151.97 ± 11.86</td>
</tr>
<tr>
<td>Total Estimasi Tinggi Badan (cm)</td>
<td>158.67 ± 10.92</td>
<td>157.55 ± 10.94</td>
<td>159.44 ± 11.16</td>
</tr>
</tbody>
</table>

Based on table 1 above, the mean value of the subjects of the study, both female and male, was 22 ± 1.16 years. The table also shows the comparison of the actual average height of the subjects with the estimated height obtained from the arch (maximum height) and chord (minimum height) values in each sample calculated by the Carrea’s Index formula. It appears that of the 46 subjects, male subjects had higher average height and the estimated height than female subjects. Meanwhile, when viewed from the calculation of the estimated height between the sides of the mandibular quadrant, in female subjects, the estimated height results on the right side are higher than the results of the calculation of the estimated height of the left side. In contrast to male subjects, the estimated height results on the left side are higher than the results of the estimated right side height estimates. The total estimated height of the right side in female subjects (158.67 ± 10.92 cm) differed by 1.53 ± 3.44 cm from the actual height of the female subjects (157.14 ± 7.48 cm), and the total estimated height the left side body in the female subject (157.55 ± 10.94 cm) differed by 0.41 ± 3.46 cm from the actual height of
the female subject (157.14 ± 7.48 cm). Meanwhile, the total estimated height of the right side in male subjects (163.06 ± 12.32 cm) differed by 4.47 ± 7.6 cm from the actual body height of male subjects (167.53 ± 4.32 cm), and the total estimated left-side height in male subjects (163.94 ± 10.20 cm) differed by 3.59 ± 5.48 cm from the actual height of male subjects (167.53 ± 4.32 cm).

Table 2 Distribution of successful and unsuccessful predictions from height estimation results by gender and jaw quadrant side.

<table>
<thead>
<tr>
<th>Prediksi</th>
<th>Kanan</th>
<th>Total</th>
<th>Kiri</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sukses</td>
<td>Tidak sukses</td>
<td>Sukses</td>
<td>Tidak sukses</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Perempuan</td>
<td>28</td>
<td>73.7</td>
<td>10</td>
<td>26.3</td>
</tr>
<tr>
<td>Laki-laki</td>
<td>4</td>
<td>50</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>69.6</td>
<td>14</td>
<td>30.4</td>
</tr>
<tr>
<td>p-value</td>
<td>0.186</td>
<td></td>
<td>0.713</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 below shows the distribution of successful and unsuccessful prediction results from the calculation of estimated height using the Carrea’s Index method to the actual height of the study subject based on gender and the side of the mandibular quadrant using the Chi-square test. From 38 female subjects, on the right side, 28 subjects (73.7%) showed successful predictions, while the remaining 10 subjects (26.3%) showed unsuccessful predictions. From 8 male subjects, on the right side, the results of a balanced and successful prediction were obtained, namely, 4 subjects (50%) had successful predictions, and 4 subjects (50%) had unsuccessful predictions. Thus it can be seen that a higher percentage of success was found in female subjects compared to male subjects on the right side, but there was no statistically significant difference (p = 0.186). Overall on the right side, there were 32 samples (69.6%) with successful predictions and 14 samples (30.4%) with unsuccessful predictions.

There was a slight differences found on the left side, where there were fewer female subjects who had success predictions compared to the right side, namely 26 subjects (68.4%), while 12 subjects (31.6%) had unsuccessful predictions. In contrast, in male subjects, on the left side of the number of samples with more successful predictions than the right side, namely 6 subjects (75%), while those who have unsuccessful predictions are 2 subjects (25%). Thus, on the left side, it appears that male subjects have a higher percentage of success than female subjects, but there is no statistically significant difference (p = 0.713). Overall on the left side, the percentage of success is not different from the right side, that is, there are 32 samples (69.6%) with predictions of success and 14 samples (30.4%) with predictions of no success.

Table 3 Correlation test results of actual height to estimated height with Carrea’s Index (Pearson correlation coefficient).

<table>
<thead>
<tr>
<th>Tinggi Badan Maksimum Kanan</th>
<th>Tinggi Badan Maksimum Kiri</th>
<th>Tinggi Badan Minimum Kanan</th>
<th>Tinggi Badan Minimum Kiri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tinggi Badan Correlation</td>
<td>.471**</td>
<td>.476**</td>
<td>.452**</td>
</tr>
<tr>
<td>p-value</td>
<td>0.001</td>
<td>0.001</td>
<td>0.002</td>
</tr>
<tr>
<td>N</td>
<td>46</td>
<td>46</td>
<td>46</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).
Table 3 above shows the results of the correlation analysis between actual height and estimated maximum and minimum height on both the right and left sides. From this table, it is known that the Pearson correlation coefficient value between the height variable and each estimated height variable is greater than zero to maximum body height of the right side is 0.471; to the maximum body height of the left side is 0.476; to the minimum body height of the right side is 0.452, and with a minimum body height of left side is 0.515. The Pearson correlation coefficient value which is getting closer to 1 indicates a stronger correlation, so from the four estimated height variable, the minimum body height of the left side coefficient is closest to 1 which means that the variable has the strongest correlation to the height variable compared to the another estimated height variable.

Table 4 Correlation test results from actual height to estimated height with a Carrea’s Index (Pearson correlation coefficient) on female subjects.

<table>
<thead>
<tr>
<th>Correlationsa</th>
<th>Tinggi Badan</th>
<th>Tinggi Badan</th>
<th>Tinggi Badan</th>
<th>Tinggi Badan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maksimum Kanan</td>
<td>Maksimum Kiri</td>
<td>Minimum Kanan</td>
<td>Minimum Kiri</td>
</tr>
<tr>
<td>Tinggi Badan</td>
<td>Pearson Correlation</td>
<td>.455**</td>
<td>.425**</td>
<td>.409*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0.004</td>
<td>0.008</td>
<td>0.011</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>38</td>
<td>38</td>
<td>38</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
a. Jenis Kelamin = Perempuan

In addition, to determine the strength of the correlation, it is also possible to see the value of p compared to the level of significance used in this study. The p-value between the actual height and the estimated maximum height (right) and the maximum height (left) is 0.001 (<0.05), which means that there is a significant correlation between the actual height and the estimated maximum height of the right side and left side respectively. Similarly, between the actual height and estimated minimum height (right), a significant correlation was obtained with a p-value of 0.002 (<0.05), and between the actual height and an estimated minimum height (left) obtained a significant correlation with a p-value of 0.000 (<0, 05). Based on the results of the Pearson correlation coefficient, marked by (**) on all estimated variables of maximum height and minimum height both right and left side with the information below the table which states that there is a significant positive correlation with actual height at a significance level of 1% or 0.01 (2-tailed). Although the significance level used in this study is the 0.05, it does not mean the results of this test indicate that it does not correlate at the 0.05 if the 0.01 is significantly correlated, then, of course, the 0.05 level will also be significantly correlated.

Table 5 Correlation test results of actual height to estimated height with a Carrea’s Index (Pearson correlation coefficient) on male subjects.

<table>
<thead>
<tr>
<th>Correlationsb</th>
<th>Tinggi Badan</th>
<th>Tinggi Badan</th>
<th>Tinggi Badan</th>
<th>Tinggi Badan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maksimum Kanan</td>
<td>Maksimum Kiri</td>
<td>Minimum Kanan</td>
<td>Minimum Kiri</td>
</tr>
<tr>
<td>Tinggi Badan</td>
<td>Pearson Correlation</td>
<td>.771**</td>
<td>.862**</td>
<td>0.556</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0.025</td>
<td>0.006</td>
<td>0.152</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).
b. Jenis Kelamin = Laki-laki
Table 4 and Table 5 above show the results of correlation test for each sex, and there are slight differences in the strength and significance of the correlation. In female subjects (Table 4), there were three significant correlation results at the 0.01 level of significance (**), namely the maximum height of right side variable with a Pearson correlation coefficient of 0.455 (p value = 0.004); maximum height of left side with Pearson correlation coefficient 0.425 (p value = 0.008); and the minimum height of left side with the Pearson correlation coefficient of 0.430 (p = 0.007). While there is one variable with significance at the 0.05 (*) significance level, namely the minimum height of right side with a Pearson correlation coefficient of 0.409 (p = 0.011). So from the four variables, the maximum height of right side variable is the one with the strongest correlation.

In Table 5, it shows that in male subjects there is one variable that correlates at the 0.01 (***) significance level, that is, the maximum height of left side variable with a Pearson correlation coefficient of 0.862 (p value = 0.006). In the table, there is one variable that correlates at the 0.05 (*) significance level is the maximum height of right side variable with a Pearson correlation coefficient of 0.771 (p = 0.025). From the two variables, although both have coefficient numbers that are very close to 1 and show that they have a very strong correlation, the level of significance of the two is different, it can be seen in the results of each p value, so that from these two variables the strongest correlation is found in maximum height of left side. The other two variables also have a correlation coefficient number that is larger and closer to 1 when compared to female subjects, namely the minimum height of right side variable of 0.556, and the minimum height variable of left side (0.667), which means there is a strong correlation between these variables on actual height, but the correlation between these two variables is not significant at the level of significance used in this study. This is because both of these variables produce a value of $p > 0.05$, namely the value of $p = 0.152$ for the minimum height of right side variable and the value of $p = 0.071$ for the minimum height of left side variable.

**Discussion**

In this study, from 46 research subjects with 92 right and left mandibular quadrant samples, the mean of estimated minimum height was lower than the mean of the actual height, and so was the mean of estimated maximum height was higher than the mean of actual height. The mean of actual height (female and male) is 158.95 ± 8.08 cm, the difference is 0.49 ± 3.08 cm from the total estimated height from the right side (159.44 ± 11.16 cm), and a difference of 0.29 ± 2.92 cm from the total estimated height from the left side (158.66 ± 11.00 cm), so this means that the mean of overall height is actually within the range of the mean of total estimated body height (minimum height - maximum height) obtained from the Carrea’s Index calculation.

In this study, based on the results of height measurements, it was found that the mean value of the male subject’s height had a higher value than the female subject. It was also found when calculating the estimated height from the dimensions of the teeth, and it was found that the mean of male subject’s height had a higher value than female subjects, thus indicating that in subjects who were taller, the dimensions of the teeth were also greater. This discovery shows that the dimensions of the teeth are directly proportional to height. Therefore, the dimensions of the teeth are considered to be a measurement tool for estimating height.

A comparison of the successful prediction results in female and male subjects and in both quadrants as a whole in this study had the same percentage of success. However, in each gender, the percentage of success was different for each side of the jaw quadrant, although both were without statistically significant differences (right p-value (0.186); left p-value (0.713)). This difference can be caused by the results of the estimated height for each gender for each side of the jaw quadrant, where the female subjects, have higher body height estimates in right quadrant than the left quadrant, in contrast, in the male subjects, estimated body height in left quadrant is higher than the right quadrant, so this causes the range to be wider and had a higher chances of the actual height being within the estimated range.

In this study, between the genders, there are differences in the percentage of success on the right and left sides, but in previous studies\(^9,10,16\) found that the percentage of success in the male subject is greater than women on both sides, with no statistically significant difference. This could be due to the small number of male subjects in this study, so further study on a larger sample and a balanced proportion of gender are needed. Similar to what was found in the study of Silva et al. (2014) where the number of female subjects was higher than that of male subjects, and the success percentage of female subjects was higher than male subjects.
In this study, a similar percentage of successes on the right and left sides and no statistically significant differences were found in each sex on each side of the jaw quadrant indicating that the Carrea’s Index method can be used on both women and men on all sides of the jaw quadrant, without affecting the percentage of success. Comparison with previous studies, namely, in a study by Lima et al. (2011), with normal dental structure, the results was higher percentage of success on the right side, as well as in research by Sruthi (2016), while in research by Silva et al. (2014), with normal dental structure, the percentage of success was higher on the left side, as was the study by Rekhi et al. (2014). This can be caused by differences in population and race that are used as research subjects. Although there is a difference in the percentage of success on each side of the jaw of previous studies, there is no statistically significant difference overall, so it can be concluded that the Carrea’s Index method can be used on any side of the jaw, of course with normal dental structure conditions as examined in this study.

From the results of the correlation test between actual height and estimated height (maximum height and minimum height) obtained from the Carrea’s Index method can be used on both women and men on all sides of the jaw quadrant indicating that the Carrea’s Index method in this study shows that the Carrea’s Index method can be used in the Mongoloid population. Therefore, the dimensions of the tooth are considered to be alternative to long bones, especially in forensic cases where no long bones or other body parts are found.

Based on the results of the Pearson correlation test for each gender, there are strong Pearson correlation coefficient numbers in both female and male subjects. But from each correlation coefficient in each gender, there are differences in the level of significance. If on the female subjects, the correlation of actual height to the estimated height is a strong correlation at the 0.01 (with p value <0.01 on the maximum height (right), and the minimum height (left)) and 0, 05 (p <0.05 in the minimum height (right)), whereas in male subjects, there was only a strong correlation according to the significance level of 0.01 (p <0.01 in the maximum height (left)) and 0.05 (p <0.05 in maximum height(right)). In the estimation results of the minimum height (left & right), although it shows a strong Pearson correlation coefficient, there is no significant correlation at the the significance level of 0.05 or 0.01. This can be due to the very small number of male subjects compared to women, so that more male subjects are needed to be able to see the significance at the expected level of significance. As explained in the study by Alwi (2010), that the smaller the significance number, the larger the sample size needed. Conversely the greater the significance number, the smaller the sample size. To get a good significance number, usually a large sample size is needed. Conversely, if the sample size gets smaller, then the possibility of more errors arises.  

**Limitation:** This study still has some limitations including small sample size and gender imbalance, narrow age range, still limited to normal tooth structure, general and less specific population, and the study carried out on living subjects, therefore further research is needed to address all the limitations of this study.

**Conclusion**

The conclusion obtained from this study is that based on the percentage of success of the Carrea’s Index method in this study shows that the Carrea’s Index method can be used in the Mongoloid population.
in Indonesia to estimate the height of an individual as an aid for individual identification. In addition, there were no statistically significant differences between the gender and the mandibular quadrant side to predict the success of height estimation so that these factors did not correlate or influence the percentage of success in height estimation using the Carrea’s Index method.

**Conflict of Interest:** None

**Source of Funding:** Self-Funding

**Ethical Clearance:** Approved

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Abstract

Purpose: To evaluate the efficacy of nurse assisted distraction strategies on postoperative pain, parent pain catastrophizing, mother and child anxiety and physiological parameters.

Method: The present study included a total of 160 mother-child dyads (2-7 years) inpatient to paediatric surgical unit. The study participants are randomized into intervention and control group. The intervention group will receive age appropriate NADS along with the standard care for three postoperative days and the control group will receive only standard care. The participants will be followed from day of admission to postoperative day 3.

Results: NADS will be delivered for three postoperative days to the children in the postoperative unit. Children received intervention had shown improvement in the postoperative pain and anxiety in these three postoperative days.

Conclusion: The findings of the study will empower nurses and health care professionals to practice distraction strategies in the postoperative unit which will decrease postoperative pain, anxiety and reduces the dosage of analgesics among children.

Keywords: Postoperative pain; Anxiety; Children; Nursing, Distraction; RCT; Protocol.

Introduction

A hospitalized child experience pain more frequently and it is a leading concern of parents and caregivers.¹ Postoperative pain involves multiple physiological mechanisms precipitated by surgical trauma.² It is associated with autonomic, endocrine, metabolic, physiological and behavioural responses.³ Evidence suggests that inadequate relief of postoperative pain results in harmful physiological and psychological consequences that eventually lead to significant morbidity, which may delay recovery and return to daily living and mortality.⁴ It is found that 64% of the
post-operative children experience moderate to severe pain and among them 29% experience unbearable pain after surgery and at least 24 hours after surgery.\textsuperscript{5} However, pharmacological method are usually practiced in all health care setting to reduce pain which is administered through different routes.\textsuperscript{6} Meanwhile, non-pharmacological techniques are commonly considered additional strategies which are used alone or in combination with pharmacological treatment.\textsuperscript{7} Non-pharmacological interventions provide relaxation and balance the physiological indicators such as blood pressure, pulse rate and respiration and also prevent the post-operative complications such as pain, sleep disorder and anxiety.\textsuperscript{8} To ensure proper management of pain in the post-operative period the pain must be assessed by using the age appropriate tools.\textsuperscript{9} The pain expression of the children is the most appropriate indicator in the assessment of pain and the children those who are not able to communicate pain must be measured by using behavioural pain scales.\textsuperscript{10} Nurses play an effective role in identifying and controlling post-operative pain and teaching the non-pharmacological interventions to the parents and caregivers\textsuperscript{11}. Non-pharmacological intervention is often used to guide attention away from painful stimuli.\textsuperscript{12} It is most effective when adapted to the patient’s developmental and cognitive level\textsuperscript{13}. Most of the studies have reported that non-pharmacological interventions are effective among children when used along with pharmacological treatment.\textsuperscript{14-20} By reviewing the literature, the researchers identified that there are non-pharmacological interventions for pain but structured interventions need to be developed and used for the children to reduce postoperative pain. However, there are research studies conducted in the area of pain assessment but interventions to reduce postoperative pain among younger children is a new concept.

**Study objectives:**

**The objectives of the study are to:**

- assess the pain, anxiety and physiological parameters of the child inpatient to surgery.
- assess the anxiety and pain catastrophizing among mother of child inpatient to surgery.
- evaluate the efficacy of NADS on pain, pain catastrophizing, anxiety of child and mother and physiological parameters.

**Hypotheses:** All research hypotheses will be tested at 0.05 level of significance.

\[
\frac{2 \left[ z_1 - \frac{z_2}{\sqrt{2}} + \frac{z_2}{\sqrt{2}} \right] \sigma^2}{d^2}
\]

\textbf{H1:} There will be significant difference in pain, anxiety, physiological parameters and use of pain medication among child undergoing surgery in the intervention group from that of the control group.

\textbf{H2:} There will be significant difference in anxiety and pain catastrophizing among mother of child undergoing surgery in the intervention group from that of the control group.

**Method**

**Study design**

A cluster randomized controlled trial

**Inclusion and exclusion criteria**

**Inclusion criteria:**

**Child:**

- inpatient for a minimum three postoperative days
- in the age group of two to seven years
- undergoing urogenital & other surgeries
- not had any developmental or behavioural disorders
- able to understand and speak Kannada or English
- accompanied by the mother

**Mother:**

- able to understand and speak Kannada or English

**Exclusion criteria:**

**Child:**

- undergoing cardiac, head and neck, orthopaedic surgeries.
- mentally retarded and physically challenged
- posted for emergency surgery

**Mother:**

- who speaks other than Kannada or English
Sample size:

Sample size is calculated by using the following formula,

The total sample for the study is 160 (80 each for experimental and control group).

Data collection:

Mother in the intervention or control group: On the day of admission, the purpose of the study will be explained to the mother and subject information sheet will be given. Written informed consent will be obtained from the mother which records mother and child participation in the study. The anxiety of the mother is assessed on day of admission and postoperative day 3 by administering the STAI Scale to the mother. On postoperative day 1 and 3 the thoughts and feelings of the mother when her child is in pain is assessed by administering the PCS-P Scale.

Child in the intervention group: On the day of admission the anxiety of the child is assessed by the researcher using mYPAS Scale. On postoperative day 1 the pain and physiological parameters will be assessed after 2 hours of surgery. Next pain and physiological parameters will be assessed every fourth hourly. After 6 hours of surgery the researcher will assess the sedation level of the child using Ramsay Sedation Scale and the child receives an age appropriate distraction intervention for thirty minutes. Each day a new distraction activity is provided for the child. To avoid cross-infection all the toys will be cleaned with the help of Dettol solution and the contaminated toys will be replaced with a new kit. After completion of distraction activity, the child is asked to relax and the pain and physiological parameters will be reassessed after 15 minutes. On postoperative day two and three the pain and physiological parameters will be assessed every seventh hourly and the distraction activity is given twice a day.

Child in the control group: All assessments are done same as the intervention group but the child receives no any distraction activity and the child will receive standard care in the postoperative unit.

Data collection tools:

1. Demographic Proforma: Demographic Proforma was developed by the researcher to collect data on sample characteristics. The tool was divided into sample characteristics and clinical data. Sample characteristics measured: age of mother and child, gender of the child, income, education of parents, previous history of surgery. Clinical data measured type of surgery, type of analgesic, demand for analgesics, pre-medications and duration of surgery.

2. Developmental psychopathology checklist for children: It is a standardized scale developed by Malavika Kapur to measure the behavioural/developmental disorders among children. For the present study the tool has been modified with the permission of the author. The checklist consists of 56 items which contains dichotomous questions (yes/no) and the areas assessed are developmental history, developmental problems, attention deficit hyperactivity, conduct disorders, learning difficulties, emotional disorders and OCD. Inter-class correlation co-efficient via analysis of variance was 0.965.

3. State trait anxiety inventory (STAI): It is a standardized tool developed by Charles D Spielberger to measure the state and trait anxiety. STAI form Y1 is composed of 20 items to measure state anxiety. State anxiety identifies the anxiety in the person by verbalizing the stress, tension and feeling “at that moment”. STAI-Y2 is composed of 20 items concerning trait anxiety which indicates the “general feeling of the person”. The higher the score is the greater the anxiety. The reliability obtained in the present study was STAI Form Y1=0.93, STAI Form Y2=0.91.

4. Modified Yale preoperative anxiety scale (mYPAS): It is a standardized tool developed by faculties of Yale University School of Medicine. The scale consists of 22 items divided into five subscales: activity, vocalizations, emotional expressivity, state of apparent arousal and use of parents. Each of the 5 categories has an individual score, ranging from the least anxious, to the most anxious behaviours. The higher the number indicates the more anxious behaviour of the child. Reliability of the tool revealed that inter observer agreement ranged from 0.68 to 0.86. Researcher has assessed the reliability of the tool by using inter-observer method and agreement was 0.92 which shows the tool is reliable.

5. Ramsay sedation scale (RSS): It is a standardized scale which is used to monitor the level of sedation. The tool contains six items and the scoring of the tool
and higher the score indicates high level of sedation. Cronbach’s alpha of the tool showed internal consistency $\alpha= 0.82$. In the present study the researcher has assessed the reliability of the tool by using Cronbach’s alpha and the internal consistency was 0.8 which reports the tool is reliable.

6. **Evendol pain scale**: It is a standardized instrument developed by Fournier-Charriere to measure the postoperative pain among younger children. The tool is composed of five subscales: vocal or verbal expression, facial expression, movements, postures, interaction with the environment. The scale contains score from 0 to 3 for each item: 0 indicates sign absent, 1=sign weak or transient, 2=sign moderate or present about half the time, 3=sign strong or present almost all the time. Inter-rater reliability showed kappa 0.7-0.9. On postoperative day 1 the researcher will take the pain measurements after 2 hour of surgery and then every fourth hourly. On postoperative day two and three pain is measured every seventh hourly. If the analgesic is administered to oral or rectal route pain is assessed after 45 minutes, 10 minutes if administered through IV route.

7. **Pain catastrophizing scale-Parent version (PCS-P)**: It is a standardized scale developed by Michael JL Sullivan to assess the negative thinking associated with pain. It includes 13 items which are rated on a 5-point scale ranging from 0= “not at all true” to 4= “very true”. The items are divided into three subscales: rumination-4, magnification-3 and helplessness-6. Items are summed across subscales to derive a total score ranging from 0-52. Higher scores reflect higher levels of catastrophic thinking. In the present study the researcher has assessed the reliability of the tool by using Cronbach’s alpha and the internal consistency of the tool is 0.9 which reports the tool is reliable.

8. **Physiological parameters**: The Heart rate, Respiratory rate and Oxygen saturation is measured by using Philips cardiac monitor (Intellivue MP5). Researcher has assessed the reliability of the monitor by using inter-observer method and agreement was 1 which shows that it is reliable.

**Data analysis**: EZR software will be used for data analysis. Descriptive statistics will be used for analysing sample characteristics. Repeated measure ANOVA to compare effect of intervention on continuous outcome.

**Ethical Clearance**: The protocol has been approved by the institutional Ethics Committee (IEC: 35/2019). The study has been registered under Clinical Trial Registry India (CTRI/2019/05/019174).

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**Table 1: Schematic representation of research methodology**

<table>
<thead>
<tr>
<th>Group</th>
<th>On admission</th>
<th>Postoperative day 1</th>
<th>Postoperative day 2</th>
<th>Postoperative day 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DPCL</td>
<td>RSS</td>
<td>Pain</td>
<td>Pain</td>
</tr>
<tr>
<td></td>
<td>STAI</td>
<td>Pain</td>
<td>BPP</td>
<td>BPP</td>
</tr>
<tr>
<td></td>
<td>mYPAS</td>
<td>PCS-P</td>
<td></td>
<td>PCS-P</td>
</tr>
<tr>
<td>Experimental</td>
<td>O₁</td>
<td>O₂</td>
<td>O₃</td>
<td>O₄</td>
</tr>
<tr>
<td>Control group</td>
<td>STAI</td>
<td>RSS</td>
<td>Pain</td>
<td>Pain</td>
</tr>
<tr>
<td></td>
<td>DPCL</td>
<td>Pain</td>
<td>BPP</td>
<td>BPP</td>
</tr>
<tr>
<td></td>
<td>mYPAS</td>
<td>PCS-P</td>
<td></td>
<td>PCS-P</td>
</tr>
<tr>
<td></td>
<td>O₁</td>
<td>O₂</td>
<td>O₃</td>
<td>O₄</td>
</tr>
<tr>
<td>Cluster</td>
<td></td>
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<td></td>
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<tr>
<td>randomization</td>
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</tbody>
</table>

**Intervention**

**Standard Care**
Keywords:
STAI: State Trait Anxiety Inventory
BPP: Bio-physiological parameters
mYPAS: modified Yale Pre-operative Anxiety Scale
DPCL: Developmental Psychopathology checklist for children (DPCL)PCS-P: Pain catastrophizing parent version

Discussion
Standardized age appropriate distraction strategies have a potential to reduce postoperative pain and anxiety among the child undergoing surgery. The current study presents an opportunity to evaluate such program among the children in the postoperative unit. The strength of the study is using standardized scales for measuring the outcomes. This is the first study where the pain is assessed using Evendol pain scale and the child receives standardized age appropriate distraction strategies intervention for postoperative pain among children. The outcomes of the study will support the training of nurses and health professionals regarding the use of pain scale for assessing postoperative pain and delivering the age appropriate distraction strategies for the child in the postoperative unit.

Conclusion
NADS will help to reduce postoperative pain and anxiety. The findings of this study will motivate the health professionals to practice distraction strategies in the postoperative unit which benefits the child and family undergoing surgery.

References


Efforts to Improve the Performance of Posyandu Cadres Based on Analysis of Cadre Empowerment in Tulungagung Regency, Indonesia

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Abstract

Posyandu is one form of Community-Based Health Efforts held together with the community in obtaining basic health services. The cadre’s role is to provide health information to the community, as a community mobilizer to come to Posyandu and a motivator to realize maternal and child health. The research was aimed at developing an effort to improve the performance of Posyandu cadres based on an analysis of empowerment in Tulungagung Regency. The study was conducted using observational analytic method with a sample of 32 Posyandu. The study was conducted in Tulungagung Regency in January-March 2020. The results showed that there was a relationship between the process of empowering and capability empowerment with the performance of Posyandu cadres (0.019; 0.001). There was a relationship between cadre training and alignment (0.002); the relationship between the availability of facilities and the role of the village with capability (0.042; 0.028) and the relationship between the development of cadres and trusts (0.028). It could be concluded that the performance of Posyandu cadres was influenced by the process of empowering alignment and capability. While trust was not related to the performance of Posyandu cadres. The process of empowering alignment was influenced by cadre training; capability was influenced by the availability of facilities and the role of villages.

Keywords: Posyandu, cadre performance, empowerment.

Introduction

One of the 2015-2020 Sustainable Development Goals (SDGs) goals is to end hunger, including overcoming malnutrition¹. Achieving these targets through health efforts and community empowerment, including Posyandu (Pos Pelayanan Terpadu/Integrated Service Posts)². Posyandu is one form of Community-Based Health Efforts (CBHE) which is held together with the community in obtaining basic health services.

Posyandu activities consist of maternal and child health services, family planning, immunization, nutrition, prevention, and prevention of diarrhea. One of the benefits of Posyandu for the community is that the growth of children under five is monitored so that it improves the health status of the community³. Early detection of nutritional cases can be done by weighing toddlers. This is intended if the child’s weight does not rise, recovery and prevention efforts can be made immediately, so as not to become malnourished. Handling according to the management of nutritional cases will reduce the risk of death so that mortality due to malnutrition can be suppressed⁴.

Cadres have a large role in the smooth running of Posyandu activities. The task of planning various activities that exist in the Posyandu, implementing, evaluating, and controlling Posyandu activities, and
reporting on Posyandu activities is carried out by cadres. The role of cadres as providers of health information to the community, community mobilizers to come to Posyandu, and motivators to help realize maternal and child health. Looking at the Posyandu cadre’s tasks, it can be concluded that the Posyandu will be implemented optimally if the Posyandu cadre’s performance is good.

Empowerment cadres for Posyandu for Toddler can be studied with an empowerment approach consisting of Alignment, Capability, Trust, and Participation, adapted from the theory of Tenner and Detoro in 1992 in Total Quality Management (TQM). The results of several studies indicate that community participation in Posyandu is influenced by cadre performance as a dominant factor and availability of facilities. There is a link between Posyandu cadre guidance and trust, capacity with Posyandu cadre participation, education, and mother’s work with the presence of toddlers in Posyandu.

According to data from the Tulungagung Regency Health Office, in 2018, there were 27 Health Center out of 32 Health Center (84.4%). If seen from the total achievement of recording-reporting indicators, the community participation in Posyandu has not yet reached the 80.0% target. Not yet achieved community participation in Posyandu or the arrival coverage of 74.7% of the 80.0% target in Tulungagung Regency in 2018, is likely due to the performance of Posyandu cadres and toddlers factors. New policies and commitments for implementation are needed to produce positive results.

The results showed that the performance of Posyandu cadres in the good category was 84.4%. The performance of Posyandu cadres is cadres carrying out their duties, both before, during, and after the opening of Posyandu, namely: disseminating information about Posyandu opening days; register; child health services (the measurement of body weight, height, head circumference of children, monitoring of immunization status of children); recording of measurement results; counseling; make home visits; provide counseling; holding discussions with mothers of toddlers; learn Posyandu Information System.

**Materials and Method**

The study was conducted for 3 months, namely from January to March 2020 in the Work Area of the Tulungagung Regency Health Office. This study uses a cross-sectional approach. The instrument used in this study was a questionnaire. The population in this study were Posyandu cadres and mothers of toddlers with a large sample of 32 Posyandu. The research sample was taken using multistage random sampling.

Primary data was taken through a Likert scale questionnaire. Data were analyzed descriptively and using the Spearman Correlation test. The scientific discussion is held to produce recommendations on the emergence of strategic issues.

**Findings:** The results showed that the availability of adequate category facilities was 71.9%, and the development of Posyandu cadres in the category was sufficient 24.0%. The availability of Posyandu facilities is: weigh tools, length/height measurements, extension media, register books. While the efforts to develop Posyandu cadres are related to the improvement of Posyandu functions and performance. The guidance covers aspects of the program, institutional, and power aspects. The results showed that the role of the village category was 68.8%. The village is responsible for providing policy support, facilities, and funds; coordinating community mobilization to attend Posyandu; coordinating cadres, Posyandu administrators, and community leaders; following up on Posyandu results; Posyandu training.

The results showed that cadres had received 62.5% training. Posyandu cadre training aims to create quality Posyandu cadres. Training is to improve skills so that cadres can participate as Posyandu managers. Posyandu cadre training is expected to improve cadre performance. The results showed that the alignment of the good category was 65.6%, the capability of the good category was 75.0%, and the trust of the good category was 68.8%. Alignment is the stage of convincing employees to understand their vision, mission, values, policies, goals, and method. Capability is the stage of building employee capacity that is increasing the knowledge, abilities, and skills of each individual and the availability of resources, method, and technology to build systems. While trust is the stage of superiors trust in subordinates raises employee confidence to do work.

The results showed that the performance of Posyandu cadres in the good category was 84.4%. The performance of Posyandu cadres is cadres carrying out their duties, both before, during, and after the opening of Posyandu, namely: disseminating information about Posyandu opening days; register; child health services (the measurement of body weight, height, head circumference of children, monitoring of immunization status of children); recording of measurement results; counseling; make home visits; provide counseling; holding discussions with mothers of toddlers; learn Posyandu Information System.
Relationship between Training and Alignment: The results of the analysis of the relationship between training and alignment can be seen in Table 1. Table 1 shows that the training, tested by Spearman Correlation with alignment, obtained Sig. (2-tailed) = 0.002 which means there is a relationship between training and alignment. Increased knowledge and skills of cadres are influenced by training so that cadres can manage Posyandu according to their competencies. This is in line with the results of research on training related to increasing cadre knowledge\textsuperscript{12}.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
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<td></td>
<td></td>
<td>Enough</td>
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</tr>
<tr>
<td></td>
<td></td>
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</tr>
<tr>
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<td>34.4</td>
</tr>
</tbody>
</table>

Table 1. Relationship between Training and Alignment in Tulungagung Regency, Indonesia, 2020

Relationship between Availability of Facilities and Capability: The results of the analysis of the relationship between the availability of facilities and capability can be seen in Table 2. Table 2 shows that the availability of facilities, tested by Spearman Correlation with capability, obtained Sig. (2-tailed) = 0.042 which means there is a relationship between facility support and capability. According to the results of interviews with respondents, counseling media (flip sheets, posters, leaflets) have been given much damage and missing. This is in line with research on the relationship between facilities and infrastructure and the practices of cadres in Posyandu, namely to improve the ability of cadres in Posyandu, the availability of facilities and infrastructure that supports\textsuperscript{13}.

<table>
<thead>
<tr>
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<th>Total</th>
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<tr>
<td>Total</td>
<td></td>
<td>8</td>
<td>25.0</td>
</tr>
</tbody>
</table>

Table 2. Relationship between Availability of Facilities and Capability in Tulungagung Regency, Indonesia, 2020

Relationship between Village Roles and Capability: The results of the analysis of the relationship between the role of villages and capability can be seen in Table 3. Table 3 shows that the role of villages, tested by Spearman Correlation with capability, obtained Sig. (2-tailed) = 0.028 which means there is a relationship between the role of the village with capability. This is in line with the results of research on the relationship between the village’s role and the empowerment of Posyandu cadres, namely the Village Head’s role in providing facilities, monitoring and supervising cadres’ tasks, considering the ability of cadres before giving assignments, giving rewards, and developing Posyandu\textsuperscript{14}.

<table>
<thead>
<tr>
<th>No</th>
<th>Village Roles</th>
<th>Capability</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Enough</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Never</td>
<td>8</td>
<td>66.7</td>
</tr>
<tr>
<td>2</td>
<td>Ever</td>
<td>3</td>
<td>15.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>11</td>
<td>34.4</td>
</tr>
</tbody>
</table>
Table 3. Relationship between the Role of Villages with Capability in Tulungagung Regency 2020

<table>
<thead>
<tr>
<th>No</th>
<th>The Role of Villages</th>
<th>Capability</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Enough</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>n</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Enough</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>36.4</td>
<td>63.6</td>
<td>100.0</td>
</tr>
<tr>
<td>2</td>
<td>Good</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
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<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>25.0</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Relationship between Posyandu Cadre Development and Trust:** The results of the analysis of the relationship between the development of Posyandu cadres and trust can be seen in Table 4. Table 4 shows that the Posyandu cadre development, tested by Spearman Correlation with trust, obtained Sig. (2-tailed) = 0.028 which means there is a relationship between the formation of Posyandu cadres with trust. Trust between the Health Center and cadres is well established with frequent cadre refreshing activities. The Health Center felt that cadres who often received coaching had been able to carry out their duties properly, resulting in trust. Cadres become more confident in carrying out their duties because they have won the trust of the Health Center. This research is in line with research that developing cadres can increase self-confidence in Posyandu cadres15.

Table 4. Relationship between Posyandu Cadre Development and Trust in Tulungagung Regency, Indonesia, 2020

<table>
<thead>
<tr>
<th>No</th>
<th>Posyandu Cadre Development</th>
<th>Trust</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Enough</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>n</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Enough</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>41.7</td>
<td>58.3</td>
<td>100.0</td>
</tr>
<tr>
<td>2</td>
<td>Good</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>Total</td>
<td>31.3</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Relationship between Alignment, Capability, Trust and Posyandu Cadre Performance:** The results of the analysis of the relationship of alignment, Capability and Trust with the performance of Posyandu cadres can be seen in Table 5. Table 5 shows that the alignment was tested by Spearman Correlation with the performance of Posyandu cadres, obtained by Sig. (2-tailed) = 0.019 which means there is a relationship between alignment and the performance of Posyandu cadres. A person’s behavior is determined by a person’s knowledge and attitude16. This is consistent with research that Posyandu cadre knowledge is related to cadre participation17.

Table 5. Relationship of Alignment, Capability and Trust with Posyandu Cadre Performance in Tulungagung Regency, Indonesia, 2020

<table>
<thead>
<tr>
<th>No</th>
<th>Alignment</th>
<th>Posyandu Cadre Performance</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Enough</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>n</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Enough</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>12.5</td>
<td>21.9</td>
<td>100.0</td>
</tr>
<tr>
<td>2</td>
<td>Good</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>3.1</td>
<td>62.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>15.6</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Table 5 shows that the capability was tested by Spearman Correlation with Posyandu cadre performance, obtained by Sig. (2-tailed) = 0.001 which means there is a relationship between capability and performance of Posyandu cadres. The procurement of facilities from the Health Center and villages should be able to support cadres to do their jobs properly. This capability is not yet maximal, possibly because cadre training is still not comprehensive. So that the soft skills of cadres are not honed and cause the cadre skills are still lacking. This is consistent with research that cadre competencies, especially in the competency of cadre knowledge, attitudes and skills related to cadre performance, and research on the availability of facilities related to cadre performance.

Table 5 shows that trust was tested by Spearman Correlation with the performance of Posyandu cadres, obtained by Sig. (2-tailed) = 0.658 means there is no relationship between trust and the performance of Posyandu cadres. Trust in this case is the mutual trust between the Health Center and the village with cadres. Overall cadre trusts are in a good category (68.8%). Tenner and Detoro stated that the trust of superiors can lead to the confidence of employees to carry out responsibilities so that the commitment to contribute to the maximum.

Conclusions
The better the process of empowering alignment and capability, the better the performance of Posyandu cadres. The alignment empowerment process is in line with the increasing frequency of Posyandu cadre training. The process of empowering capability will be better if the availability of facilities is more complete and the role of the village is getting better. Meanwhile, cadre trusts will be better if Posyandu cadre guidance is also increasing in quality and quantity. Various ways can be done by several parties to help in improving cadre performance by increasing factors related to cadre performance.

Acknowledgments: The author would like to thank Universitas Airlangga, which has allowed completing this final project.

Source of Funding: Self-funding

Conflict of Interests: Nil

Ethical Clearance: The study has passed the ethical test from the Ethics Commission of the Faculty of Nursing, Universitas Airlangga (EC Number: 1936-KEPK). The respondents’ identities have all been deleted from the dataset. Respondents have provided written approval for their involvement in the study.

References


Progression of Mental Health Issues During COVID-19

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²Senior Professor, Dept. of Psychology, Andhra University.

Abstract

The COVID-19 virus, emerged at the end of 2019 began threatening the health and lives of millions of people within few weeks. At present all regions of the world, declared lockdown for controlling highly contagious and pandemic virus. During this lockdown period people are restricted to stay at home, for few weeks. During the idle stay at home for very long hours, will cause mental health problems, like stress, fear, anxiety, depression and sleep problems. In this present study, the researcher, made an attempt to study the impact on mental health of individuals during the lockdown period. The basic aim of this study: is to find out the viz. “Mental health problems” and its influence on ‘Gender, Age, Marital status and Occupation’ differences. The data has been collected through online questionnaire and analyzed using “one way analysis of variance”, t-test and Correlation. The study found that significant mental health problems attributed more in female than male folk. There is significant social dysfunction in female than male. Middle age group i.e. (30-44) have more stress and pressure of future and job shortening are creating depression.

Keywords: Anxiety, Social Dysfunction, somatic problems, Depression.

Introduction

Corona viruses are a large family of viruses that cause diseases ranging from the common cold to more serious ones. The COVID-19 Coronavirus was first detected in China in December 2019 and has since spread into all countries in the world. The present study observed, that, ‘the messages for the general population’, the World Health Organization (WHO) in January 2020, declared the outbreak of COVID-19, to be Public Health Emergency of international concern. WHO made the assessment that COVID-19 can be a characterized as a pandemic, which generates stress throughout the population.¹⁴

The people also have affected by COVID-19, they deserved our support, compassion and kindness in order to reduce stigma. The public in general experiencing invisible, fear, pressure, strain and strain. But the stress and strain with Psychosocial wellbeing is as important as managing physicalhealth. To avoid the Covid-19, take sufficient healthy food, engage in some physical activity and stay in contact with family and friends creates, pleasure, happiness, which helps to avoid the pressure and strain. As a responsible citizen, you must know how to “De-stress” and keeping yourself psychologically well. This is “Not a Sprint, It’s a Marathon”.

This Corona virus has quickly alerted governments and its public health systems, Countries have initiated preventive measures to limit the spread of virus. As Millions of lives have been significantly impacted, efforts are being made at a global, multi-level, to address through stress-coping-adjustment processes. Accordingly, in our country, the national government have taken stringent measures and the Andhra Pradesh Government have also implemented all these measures.

Corona viruses are a group of inter-related viruses that spread diseases among the public in general and birds. The COVID-19 symptoms are fever, tiredness and dry cough, throat pain, aches and pains, nasal congestion,
running nose, or diarrhea, smell less, tasteless and eye infection. These symptoms are usually started mild and begin gradually. Some people become infected but don’t attribute any symptoms about feel unwell. About 80% of the people recover from the disease without any special treatment if the patient detected early. Around 1 out of every 6 people who got tested as positive, of COVID-19 becomes seriously ill and develops difficulty in breathing. Older people and those with underlying medical problems like high blood pressure, heart problems or diabetes, are more likely to develop serious illness. People with fever, cough, throat pain and difficulty in breathing should seek medical attention.

People can perceive COVID-19 from others who have tested positive. The disease can spread from person to person through their micro-splinters delivered from the nose, mouth or eye drops are strong agents to spread of Covid-19 from person to person or person to a group. These emitted splinters land on objects and surfaces around the person, stay alive for five to ten minutes. The people in and around that area, perceive that virus and infected with COVID-19 by touching these objects or surfaces, then touching their eyes, nose or mouth. People can also catch COVID-19 if they breathe in droplets from a person with COVID-19 who coughs out or exhales droplets. This is why it is important to stay more than 2 meter (6 feet) away from a person who is sick.

Maria Oquendo (2020) said that those who are already suffering from any kind of psychiatric problem are going to have a heightened anxiety response. Moreover these conditions increase the risk for suicidal behavior. Indian Psychiatry Society (2020), found that sudden rise in those suffering from mental illness is up to 20 per cent. And also at least one out of every five Indians is suffering from mental illness.

Raju MVR (2020) said that setting goals, minimizing distractions, building trust, reducing the use of social media, reading books, watching comedy videos, playing indoor games would help in offering comfort to those coping with Anxiety. Zandifan and Badrfan (2020) stated that ‘the role of unpredictability, uncertainty, seriousness of the disease’, misinformation and social isolation in contributing to stress and mental health.

Shigemura (et al). (2020) Emphasized the economic impact of covid-19 and its effect on wellbeing, as well as the likely high levels of fear and panic behavior such as hoarding and stockpiling of resources, in the general population. Dong and Bovey, (2020) Pointed out that wide scope and spread of covid-19 could lead to a true mental health crisis, especially in countries with high case loads which would require both large scale psychosocial crises interventions and incorporation of mental health care in the future. According to Thiyamkiransingh and Raju MVR (2020) the psychosocial consequences from the fallout of the pandemic like Depression, Anxiety, stress, loneliness financial loss, rise domestic violence are a cause of worry, especially those working in the mental health community.

Duran and Zhu (2020) Pointed out that while western countries have incorporated psychological intervention into their protocols. Bao (et. al) (2020) Highlighted the services that were already being provided in china and also provided a list of strategies for general public to minimize out break related stress. a) Assessment of accuracy of information b) Enhancing social support c) Reducing the stigma associated with disease d) Maintaining as normal a life as feasible while adhering to safety measures e) Use of availability of psycho social services when needed. Raju MVR (2020) said communication is the key for parents to educate children about the impact of corona virus and the safety standards to follow in order to keep the virus at bay. This can also take an interesting format such as a story telling. The fear of losing dear ones and the possibility of getting infected is high among youngsters. We need to build confidence among them and help them erase their untold fears.

Ho et al., (2020)Discussed the role of improved screening for mental disorders, improving links between community and hospital services and providing accurate information to general public in order to minimize maladaptive responses such as panic and paranoia regarding the disease and its transmission. Li, Z.et al., (2020) Highlighted the role of anxiety as dominant emotional response to an outbreak and the need for adequate training of mental health care personnel and optimal use of technological advances to deliver mental health care. Raju MVR (2020) said, intends to provide counseling to 1) COVID-19 affected people and their families. 2) Those quarantined at home and their family members, 3) doctors, nurses and paramedical, personal of frontline department Revenue, police and Municipal Corporation etc. 4) Those working from home, people away from home and their kin, 5) critically alcohol dependent, 6) those vulnerable to acute attacks of Blood pressure and Diabetes and 7) people in depression.
Objectives of Study:

• To find out gender difference and marital status on mental health problems.
• To find out differences among various age groups and occupations on mental health problems.
• To find out the relationship among sub variables of mental health problems.

Method

Sample: The sample of 107 (Male 67 and 40 Female) participants with age range from 18 to above 45 years. Participation was voluntary and anonymous. The purposive sampling method was used to include participants in the study. The data was collected through what’s app and email of the respondents in Andhra Pradesh.

Measures: The questionnaire developed by Sarvani, G. and Raju, M.V.R. (2020) “The Mental Health Problems”, “Lifestyle during lock down period” and “Awareness of covid-19” covered in the questionnaire, was classified into three broad categories. First category items related to Mental Health Problems during the lock down period (COVID-19), reliability 0.38. Second category items related to Lifestyle during lock down period, reliability 0.27. Third category items related to Awareness of covid-19, reliability 0.33. A total 34 items are listed in this questionnaire. It was a three point Likert scale - one indicated strongly dis-agree and three indicates strongly agree, with intermediary score of undecided. Reverse scoring was given for some of the negative statements present in the questionnaire.

Result and Discussion

The data analyses, under table -1 showed that female (M=4.70) have high mean score than male (M=3.94) in social dysfunction, while, t- test value 3.7 at 0.01 level which indicates that women have difficulty to overcome the problems at work place, difficulty to take decisions and difficulty to face future situations.

Table 1: Differences of male and female on mental health problems of individuals

<table>
<thead>
<tr>
<th>Mental Health Problems</th>
<th>Gender</th>
<th>Number</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>Male</td>
<td>67</td>
<td>14.1</td>
<td>2.36</td>
<td>1.54</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>40</td>
<td>14.8</td>
<td>2.99</td>
<td></td>
</tr>
<tr>
<td>Social Dysfunction</td>
<td>Male</td>
<td>67</td>
<td>3.94</td>
<td>1.04</td>
<td>3.7**</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>40</td>
<td>4.70</td>
<td>1.47</td>
<td></td>
</tr>
<tr>
<td>Somatic</td>
<td>Male</td>
<td>67</td>
<td>1.31</td>
<td>.60</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>40</td>
<td>1.30</td>
<td>.60</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>Male</td>
<td>67</td>
<td>4.16</td>
<td>1.38</td>
<td>.32</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>40</td>
<td>4.32</td>
<td>1.43</td>
<td></td>
</tr>
</tbody>
</table>

**p< 0.01

Remaining factors like anxiety and depression mean values are more in female than male but not significant. Which means female group is suffering with anxiety, insomnia and stress and pressure due to house hold chores.

Table-2 results indicated that Anxiety mean (M=15.2) value high in 30-44 age group compare with other groups, social dysfunction mean (M=4.32) value and somatic problems mean (M=1.34) high in above 45 age group. Depression Mean value (M=4.69) high in 30-44 age group and also this group is significant t-test value 3.36, significant at 0.01 level. Which means 30-44 age group is middle adulthood group has stress and pressure due to uncertainty of future and extending lockdown period.
Table 2: Differences among age groups of mental health problems of individuals

<table>
<thead>
<tr>
<th>Mental Health Problems</th>
<th>Age</th>
<th>Number</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>F-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>18-29</td>
<td>46</td>
<td>14.02</td>
<td>2.75</td>
<td>1.63</td>
</tr>
<tr>
<td></td>
<td>30-44</td>
<td>36</td>
<td>15.02</td>
<td>2.21</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Above 45</td>
<td>25</td>
<td>14.16</td>
<td>2.85</td>
<td></td>
</tr>
<tr>
<td>Social Dysfunction</td>
<td>18-29</td>
<td>46</td>
<td>4.28</td>
<td>1.25</td>
<td>0.33</td>
</tr>
<tr>
<td></td>
<td>30-44</td>
<td>36</td>
<td>4.08</td>
<td>1.10</td>
<td></td>
</tr>
<tr>
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<td>Above 45</td>
<td>25</td>
<td>4.32</td>
<td>1.51</td>
<td></td>
</tr>
<tr>
<td>Somatic</td>
<td>18-29</td>
<td>46</td>
<td>1.28</td>
<td>0.61</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>30-44</td>
<td>36</td>
<td>1.27</td>
<td>0.61</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Above 45</td>
<td>25</td>
<td>1.34</td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>18-29</td>
<td>46</td>
<td>3.91</td>
<td>1.15</td>
<td>3.36**</td>
</tr>
<tr>
<td></td>
<td>30-44</td>
<td>36</td>
<td>4.69</td>
<td>1.65</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Above 45</td>
<td>25</td>
<td>4.12</td>
<td>1.30</td>
<td></td>
</tr>
</tbody>
</table>

**p<0.01

It is found that (Table 3), Married have more mental health problems compare with single or unmarried i.e. Anxiety (M=14.6), social Dysfunction (M=4.25), somatic problems (M=1.31) and depression (M=4.37) which indicates that married have many responsibilities of family, children and occupational work load etc. but there is no significant value of t-test.

Table 3: Differences of Marital status on mental health problems of individuals

<table>
<thead>
<tr>
<th>Mental Health Problems</th>
<th>Marital Status</th>
<th>Number</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>Single</td>
<td>40</td>
<td>13.9</td>
<td>2.45</td>
<td>2.04</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>67</td>
<td>14.6</td>
<td>2.69</td>
<td></td>
</tr>
<tr>
<td>Social Dysfunction</td>
<td>Single</td>
<td>40</td>
<td>4.17</td>
<td>1.10</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>67</td>
<td>4.25</td>
<td>1.36</td>
<td></td>
</tr>
<tr>
<td>Somatic</td>
<td>Single</td>
<td>40</td>
<td>1.30</td>
<td>0.56</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>67</td>
<td>1.31</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>Single</td>
<td>40</td>
<td>3.97</td>
<td>1.07</td>
<td>2.03</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>67</td>
<td>4.37</td>
<td>1.55</td>
<td></td>
</tr>
</tbody>
</table>

It is noticed from Table 4 showed that Anxiety mean value (M=14.7) and somatic problems mean value (M=1.35) high in employees (government, private, professionals and self employed). It indicates that due to anxious about future, uncertainty of job all these increase somatic problems like head ache stomach ache etc. Others (home makers, retired, unemployed) have high mean value in social dysfunction (M=5.00) and depression (M=4.62) which indicates that uncertainty in lockdown; unemployment and home makers have more workload at home, all these factors increase social dysfunction and depression. More over others have (F=3.57) significant effect on social dysfunction.
Table 4: Differences among various occupation on Mental Health problems of individuals

<table>
<thead>
<tr>
<th>Mental Health Problems</th>
<th>Education</th>
<th>Number</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>F-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>Student</td>
<td>28</td>
<td>13.7</td>
<td>2.45</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Employee</td>
<td>65</td>
<td>14.7</td>
<td>2.36</td>
<td>1.43</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>14</td>
<td>14.1</td>
<td>3.77</td>
<td></td>
</tr>
<tr>
<td>Social Dysfunction</td>
<td>Student</td>
<td>28</td>
<td>4.20</td>
<td>1.17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Employee</td>
<td>65</td>
<td>4.00</td>
<td>1.00</td>
<td>3.57**</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>14</td>
<td>5.00</td>
<td>2.30</td>
<td></td>
</tr>
<tr>
<td>Somatic</td>
<td>Student</td>
<td>28</td>
<td>1.32</td>
<td>0.61</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Employee</td>
<td>65</td>
<td>1.35</td>
<td>0.64</td>
<td>1.26</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>14</td>
<td>1.07</td>
<td>0.26</td>
<td></td>
</tr>
<tr>
<td>DEPRESSION</td>
<td>Student</td>
<td>28</td>
<td>3.80</td>
<td>1.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Employee</td>
<td>65</td>
<td>4.40</td>
<td>1.54</td>
<td>1.97</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>14</td>
<td>4.62</td>
<td>1.14</td>
<td></td>
</tr>
</tbody>
</table>

**p<0.01

Table 5 shows that there is correlation between Anxiety and social dysfunction at 0.01 level of significance (r=0.39), correlation between Anxiety and somatic problems at 0.05 level of significance (r=0.22) and correlation between Anxiety and Depression at 0.01 level of significance (r=0.48). There is correlation between Social Dysfunction and Depression at 0.01 level of significance (r=0.28).

Table 5: Correlation Matrix of Mental Health problems of individuals

<table>
<thead>
<tr>
<th>Mental Health Problems</th>
<th>Anxiety/Insomnia</th>
<th>Social Dysfunction</th>
<th>Somatic problems</th>
<th>Depression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety/Insomnia</td>
<td>1</td>
<td>.39**</td>
<td>.22*</td>
<td>.48**</td>
</tr>
<tr>
<td>Social Dysfunction</td>
<td>1</td>
<td>.13</td>
<td>.28**</td>
<td></td>
</tr>
<tr>
<td>Somatic problems</td>
<td></td>
<td>1</td>
<td>.22**</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

**p<0.01,*p<0.05

Moreover there is significant relation between somatic problems and depression at 0.01 level of significance (r=0.22). It is indicated that anxious feelings effect on social dysfunction, somatic problems and depression. Social dysfunctions like future uncertainty and difficulty to face the situations are creating pressure and stress and its lead to depression. Moreover somatic problems like head ache and stomach ache effect on depression. So all these mental health problems are inter related and it’s create mental illness during the lockdown period.

Conclusion

During the lockdown period, under Covid-19, brought huge change in our routine habits and in our life styles. People are facing many problems, due to non-availability of vegetables, milk and other domestic needs. The researcher collected data for about 20 days during the lock down period. In this study significant mental health problems attributed more in female than male folk. There is significant social dysfunction in female than male. Others (home makers, unemployed)
have workload at home and increase unemployment etc are creating social dysfunction. Middle age group i.e. (30-44) have more stress and pressure of future and job shortening are create depression.

Suggestions: The Social networks should not encourage “spreading of false rumors or news”.

The Social Networks should promptly and truthfully inform about Covid-19.

The Central/State Governments and The Police Department must actively counter the discriminatory attitudes and behaviors that emerge as a result of misrepresentations.

Accept the medical support provided by the state/central governments.

Need to introduce Psychological counseling services

Social support is very important to create confidence and to develop good mental health, well being, to avoid the fear among their public.

Conflict of Interest: Nil

Ethical Clearance: Not applicable

Source of Funding: Self

References

199
14. https://www.who.int/health-topics/coronavirus#tab=tab_1
Assessment of Knowledge and Attitudes toward Attention Deficit/Hyperactivity Disorders among Primary Schools’ Teachers in AL-Najaf City

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Abstract

Attention deficit/hyperactivity disorder (ADHD) is one of the common emotional, cognitive and behavioral disorder in primary school children and it affects on children socially and academically, welfare. An important role in identify of AD/HD due to their daily contact with students in a range of related situations. Basically, elementary school teachers’ need to knowledge and enhance their positive attitude on pupils with ADHD to create a positive learning environment. Consequently, the present investigator made an insight into the aim of the study as follows: to assess teachers’ Knowledge and attitude toward pupils with ADHD and to find out the correlation between knowledge of primary school teachers’ regarding ADHD. As well as to find out the relationship between the teachers’ knowledge and their demographic data. The study was conducted on at governmental primary schools at Al-Najaf City, Iraq. A total of the (10) governmental primary schools selected randomly from total (253) governmental primary schools in Al-Najaf City. A purposive (non-probability) sample of (70) primary school teachers’ were selected from the candidate schools were included in the present study. During the period of 1st September 2018 to 30th May 2019. The data was collected by questionnaire which consisted of two parts, first part consists socio demographic sheet. Second part is about knowledge and attitude which consist of (53) items scale of teachers’ knowledge and attitude about children with ADHD. In the present study. Findings revealed a poor in teachers’ knowledge of as well as satisfied responses attitude (negative)to pupils with AD/HD among elementary school teachers. Fondly the our main findings indicate that there is a significant positive correlation between the teachers’ knowledge and the teachers attitude toward children with AD/HD. And there is a significant relationship between demographic characteristics and do of knowledge for the sample such as: (age, education level, years of experience, main sources of information). Thus, it is recommended for responsible parties to notes the need for greater efforts to provide teacher training specifically in identifying and managing children with ADHD.

Keyword: Attention deficit/hyperactivity disorder (ADHD); Teachers; knowledge; Attitude; perception; Primary school.

Introduction

Early childhood is one of the most important stages of development in a person’s life, as the character begins to develop through the child’s interaction with the environment.¹ Mental process (attention), plays an important role in his intellectual development. Some of the children may have a deficit in their attention associated with hyperactivity. This condition may lead to them to do inappropriate behavior, the disorder is characterized by severe difficulties in one or more of the three regions; lack of attention, impulsivity and hyperactivity.² ADHD is one of the most behavioral disorders widespread among students affecting an estimated of 8% to 12% of school-aged children and impact roughly 1-2 students in each classroom over United States.³ The estimated of ADHD among elementary school children in Baghdad/Iraq is approximately 10%.⁴ In another recent study conducted in Najaf/Iraq on several primary school, the prevalence rate among children of school age was approximately 25% according to teacher reports.⁵ Given
that school teachers are often the first to notice behavioral difficulties in children, it is surprising that relatively little research has been done with teachers. According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM5), major types of AD/HD have been found including mostly ADHD presentation “ADHD-PI”, Hyperactivity disorder and attention deficit are often hyperactive, and this type is higher in females than in males. “ADHD-PHI”, this type we attribute to males is higher than for females and ADHD combined presentation Hyperactivity “ADHD-C”. Based on these results, the researcher suggested that comprehensive screening for other problems that occur with ADHD is important and treatment profiles should be tailored by comorbidity status and levels of functional impairment in school settings.

**Material and Method**

A descriptive analytic study was carried throughout present study to assessment of knowledge and attitudes toward attention deficit/hyperactivity disorders among primary schools’ teachers. The study is conducted from 1st September 2018 to 30th May 2019. A purposive (non-probability) sample of (70) primary school teachers’ were selected from the candidate schools were included in the present study. The study was conducted on at governmental primary schools in (northern and southern) of Al-Najaf City, Iraq. A total of the (10) governmental primary schools selected randomly from total (253) governmental primary schools in Al-Najaf City. Instruments used in the study are an assessment tools. The data are collected through the use of self administered technique as means for data collection, by using a questionnaire consists of three parts. First part socio-demographic; the second part contains Knowledge of Attention Deficit Disorder Scale -36- items developed by 8. To measure teachers’ knowledge and of perception on ADHD and part three, teachers’ attitudes scale (25-items) is a measure of attitude toward pupil with ADHD developed by9,18. The researcher adopted foreword/backward translation for the study scales (knowledge and attitude), i.e. the English version of the scales are translated into Arabic version and then an experts from the English specialty are selected to translate the Arabic version into an English one and to compare the two versions of English instruments. Some modifications are needed to complete the study instrument as the experts suggestions. After review and evaluation by the experts, reveal that the instrument has adequate content and major changes have been done such as number of alternative become multiple selection questions to all items according to their suggestions. Reliability of the questionnaire is determined through a pilot study and the validity is achieved through a panel of (22) experts. The data was described statistically and analyzed through use of the descriptive and inferential statistical analysis procedures.

**Results**

This figure shows that the participants’ experience varied from 11-21 years of experience (38.60 %, n=27).

![Figure 1. Distribution of the sample of the study according to their experience.](image)

This figure shows that the participants 10 or less years of experience (38.60%).
Figure 2. The main source of information about ADHD.

This figure shows that 24.7% and (11.4%), their information obtained from the Internet and social media.

Table (1). Distribution of the sample regarding total Knowledge about ADHD.

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>No.</th>
<th>Poor F</th>
<th>%</th>
<th>Fair F</th>
<th>%</th>
<th>Good F</th>
<th>%</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>70</td>
<td>57</td>
<td>81.4</td>
<td>11</td>
<td>15.7</td>
<td>2</td>
<td>2.9</td>
<td>70</td>
<td>100</td>
</tr>
</tbody>
</table>

As shown in Table 1, the vast majority of the sample 81.4% have poor knowledge about ADHD, whereas (15.7%) of them have a fair level of knowledge about ADHD.

Table (2). Distribution of the sample regarding attitude about ADHD

<table>
<thead>
<tr>
<th>Attitude</th>
<th>No.</th>
<th>Satisfied F</th>
<th>%</th>
<th>Partially satisfied F</th>
<th>%</th>
<th>Dissatisfied F</th>
<th>%</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>70</td>
<td>50</td>
<td>71.4</td>
<td>13</td>
<td>18.6</td>
<td>7</td>
<td>10</td>
<td>70</td>
<td>100</td>
</tr>
</tbody>
</table>

The table revealed that 71.4% have satisfied responses about ADHD, whereas (18.6%) of them have partially satisfied level.

Table (3). Association between Knowledge Domains and teachers attitude.

<table>
<thead>
<tr>
<th>Demographic data</th>
<th>General information</th>
<th>Symptom diagnosis</th>
<th>Treatment</th>
<th>Total Knowledge</th>
<th>Total Attitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>General information</td>
<td>Pearson Corre.</td>
<td>0.277</td>
<td>0.094</td>
<td>0.681</td>
<td>0.489</td>
</tr>
<tr>
<td>Sig.</td>
<td>0.020</td>
<td>0.441</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Symptom diagnosis</td>
<td>Pearson Corre.</td>
<td>0.277</td>
<td>0.331</td>
<td>0.771</td>
<td>0.231</td>
</tr>
<tr>
<td>Sig.</td>
<td>0.020</td>
<td>0.005</td>
<td>0.000</td>
<td>0.000</td>
<td>0.055</td>
</tr>
<tr>
<td>Treatment</td>
<td>Pearson Corre.</td>
<td>0.094</td>
<td>0.331</td>
<td>0.643</td>
<td>0.249</td>
</tr>
<tr>
<td>Sig.</td>
<td>0.441</td>
<td>0.005</td>
<td>0.000</td>
<td>0.000</td>
<td>0.038</td>
</tr>
<tr>
<td>Total Knowledge</td>
<td>Pearson Corre.</td>
<td>0.681</td>
<td>0.771</td>
<td>0.643</td>
<td>0.468</td>
</tr>
<tr>
<td>Sig.</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

This table shows a signified positive correlation between teachers’ knowledge and teachers attitude (r = 0.468, at P-value = 0.0001).
Table (4). The Relationship between the total teachers’ knowledge with respect to their socio-demographic characteristics:

<table>
<thead>
<tr>
<th>Demographic data</th>
<th>Chi-square value</th>
<th>d.f.</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age/years</td>
<td>11.538</td>
<td>4</td>
<td>0.021</td>
</tr>
<tr>
<td>Education level</td>
<td>6.894</td>
<td>4</td>
<td>9.562</td>
</tr>
<tr>
<td>Years of Experience</td>
<td>13.592</td>
<td>4</td>
<td>0.026</td>
</tr>
<tr>
<td>Main Sources of information</td>
<td>15.659</td>
<td>12</td>
<td>0.032</td>
</tr>
</tbody>
</table>

The study results shows a significant association between teachers’ knowledge with age, their education level, years of experience and main Sources of information source information at p-value less than 0.05.

Discussion

The carried result revealed most of the teachers were a young age (31-40) years old category. This finding reflect two important approach, one, young teachers’ has been found to be challenging for the attentional and meta cognitive capacities of most primary school pupils. This is similar to the results of,10 entitled “Effect educational program on elementary school teachers knowledge, attitude and classroom management techniques regards ADHD”, who found that the most ages of teachers were at (31-40) years old. The results of this study show that the majority of participants’ teaching experience of study sample were at 10 or less years,(38.6%) (Figure 1). This result of the study was do not agree with the study11, who found more than one third (46.7%) of them had more than 15 years teaching experience. Regarding the main sources of acquiring information about ADHD, the present study showed that 24.7% of teachers acquired knowledge about ADHD from the Internet followed by 11.4% from social media and (10%) from television programs (Figure 2). This result reflects the tremendous availability of information on the internet in this era, however, reliance on the internet as a source of information is not appropriate, as all information available online is not from original sources and when it comes to information about the disease, one must be careful.13. (Table 1,2)Distribution of the sample regarding total Knowledge and total attitude about ADHD. The result of the study revealed that most of the participants have poor knowledge and negative satisfied attitude toward pupils with ADHD. Recently, several studies conducted that this result may be due to the teachers not knowing about this disease and how to deal with the child who suffers from it and it cannot appreciate its importance, so the child neglects. Probably, The shortfall in the quality of teacher preparation and standards in Iraq, which makes it difficult in completing the assessment schedules that professionals need in the diagnosis of ADHD, it is necessary to fully know the characteristics and criteria of ADHD as a neurobiological disorder. Several studies,13,12,15, found that the study reveals that most of the teachers’ had poor knowledge regarding general information of ADHD as well as inadequate knowledge about general information and symptom diagnosis and, treatment, teachers scores on KADDS were poor (knowledge general information domain (57%); symptom diagnosis domain (59.1%) and treatment domain 63%), pointing to a significant lack of knowledge about ADHD. Second, teachers’ level of knowledge of ADHD correlated positively with their level of confidence in teaching a student with ADHD. Third, teachers level of knowledge of ADHD was positively related to their prior training about ADHD. (Table 3). Fondly the our main findings indicate that there is a significant positive correlation between the teachers’ knowledge and the teachers attitude (r = 0.468, P<0.0001). Because teachers with better knowledge, As we expected, the teachers could be less negative attitudes towards ADHD. This result is congruent with a large group of research studies such as the one by13, “Knowledge and attitude of male primary school teachers about ADHD in Riyadh, Saudi Arabia”, reported the significant correlation between a teacher’s knowledge and attendance of a structured training.
course, attendance of structured training courses affected the teacher’s knowledge and attitude toward pupils with ADHD. Moreover, it found that there was a significant positive correlation between knowledge and attitude. Also, “Teachers’ perception and attitudes toward ADHD in primary school”. Their findings indicate that there is a significant correlation between the teachers’ knowledge and the teachers attitude \( (r=0.249 \text{ and } P=0.000^*) \). Table (4). The study results show a significant association between teachers’ knowledge with age, education level, years of experience and main Sources of information source information at p-value less than 0.05. Perhaps, many younger teachers using a new train for knowledge and culture such as I pad and pc computer technology making them more acceptable for education program than older teachers. This result was supported by, “who to the study examines and compares general and special education teachers’ knowledge and misconceptions about ADHD. In addition, it seeks to investigate the role of specific demographic variables. They found that “statistically significant relation between teachers’ knowledge and their age. The finding of this study contradicts that of, who found that education level of teachers did not have significant influence over their knowledge of ADHD. While the finding of this study asserted that of, who found that the education level of teachers did have a significant influence on the knowledge and attitude of primary school teachers towards pupils with ADHD, teachers’ attitudes towards ADHD children are already sufficient because they often meet with their students and know the best way to deal with them. This result agrees with, after teachers gain classroom experience, the study recommended that knowledge of ADHD develops rather than during their education, classroom experience may evoke greater knowledge of ADHD due to contact with pupils who have ADHD, in-service training on ADHD and information gained from parents, other teachers, or individual study. Conclusion: A poor in teachers’ knowledge of as well as satisfied responses attitude (negative) to pupils with AD/HD among elementary school teachers. Fondly the our main findings indicate that there is a significant positive correlation between the teachers’ knowledge and the teachers attitude toward children with AD/HD. And there is a significant relationship between demographic characteristics and do of knowledge for the sample such as: (age, education level, years of experience, main sources of information). Thus, it is recommended for responsible parties to notes the need for greater efforts to provide teacher training specifically in identifying and managing children with ADHD. At least one, the teachers should participate in a training session about how to dealing with children suffer from ADHD. A mass media approaches should be used in population in order to increasing the teachers’ knowledge and enhance their attitude about the ADHD.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experiential protocols were approved under the College of Nursing, University of Babylon, Iraq and all experiments were carried out in accordance with approved guidelines.

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Feasibility of Activating Electronic Health Care System in Ibn Rushed Hospital

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Abstract

A descriptive study was conducted on health care providers them use electronic health care system and patients or clients in Ibn Rushed Teaching Hospital in Baghdad-Iraq. To evaluate the feasibility of activating electronic health care system, Data was collected using a developed self-administrated questionnaire; data was collected from March 20th, 2019 to May 6th 2019.

A purposive sample (non-probability sample) were selected (N=115) the study sample was divided into two parts, the first part is healthcare providers and their number (65), the number of physicians is (32) and the number of nurses is (33). The second part of the sample is patients or clients and their number (50).

Data were analyzed through the application of descriptive and inferential statistical approaches by using Statistical Package for Social Science (SPSS) version 19.

For health care providers, the findings for revealed that most of the respondents were males with age’s range from (31 to 39) years old, most of the respondents were physicians with (8 to 17) years’ experience. Most of the responses regarding of feasibility of activating electronic health care system, there are feasibility from activating electronic health care system (83%).

As for results patients and clients Most of the respondents were males with age’s range from (35 to 55) years old, level education for respondents were Primary and Preparatory education. Most of the responses regarding of feasibility of activating electronic health care system, there are feasibility from activating electronic health care system (90%).

The study recommended the government should be well informed about the benefits and latest innovation in e-Health so as to encourage appropriate allocation of budget, so that e-Health policy implementation can be taken more seriously. Highly recommendation the Ministry of Health to impose and generalize the experience of the electronic health care system in all hospitals in the country. Highly recommended that the educational sector inculcate e-Health into the curriculum for the integration of IT solutions into healthcare to flow successfully, this will provide health care givers graduating from learning institutions systemic training and education on the use of the e-Health. Recommended for further studies to adopt both quantitative and qualitative research approaches in similar studies to generate more responses from participants. This would help reveal whether or not the intended benefits of the implemented E-Health to patients are actually realized.

Keywords: Feasibility, electronic health care system.

Introduction

Electronic health (E-Health) is one of the 21st century innovations in healthcare. It is an umbrella term, which portrays the joined utilization of electronic correspondence and data innovation in the health/wellbeing division as well as the use of digital data transmitted, stored and recovered electronically for clinical, educational and administrative purposes, both at the local site and at distance². Since the inauguration of e-health, it has transformed the healthcare sector
and embraced it’s description by Intel as a concerted effort undertaken by leaders in health care and hi-tech industries to fully harness the benefits available through convergence of the Internet and health care (2). E-Health or health information technology (IT) as the case may be has the potential to improve the health of individuals and the performance of providers, yielding improved quality, cost savings and greater engagement by patients in their own health care (3).

E-Health is the use of information and communication technologies (ICT) for health as defined by the World Health Organization (WHO). E-Health has been a priority for the World Health Organization (WHO) since 2005, when the World Health Assembly resolution WHA58.28 was adopted: “e-Health is the cost-effective and secure use of information communication technologies (ICT) in support of health and health related fields, including health-care services, health surveillance, health literature and health education, knowledge and research” (4).

**Methodology**

A descriptive study was conducted on health care providers them use electronic health care system and patients or clients in Ibn Rushed Teaching Hospital in Baghdad-Iraq. To evaluate the feasibility of activating electronic health care system, Data was collected using a developed self-administrated questionnaire; data was collected from March 20th, 2019 to May 6th 2019.

The tool of the study is the questionnaire, which has been constructed and design for the purpose of the study after extensive reviews of available literature and related studies. The study instrument consists of two parts. The first part includes health care providers questionnaire, the second part includes patients or clients questionnaire, A purposive sample (non-probability sample) were selected (N=115) the study sample was divided into two parts, the first part is healthcare providers and their number (65), the number of physicians is (32) and the number of nurses is (33). The second part of the sample is patients or clients and their number (50).

Data were analyzed through the application of descriptive and inferential statistical approaches by using Statistical Package for Social Science (SPSS) version 19.

**Result of the Study**

<table>
<thead>
<tr>
<th>Demographic data</th>
<th>Rating and scoring</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>31</td>
<td>62</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>19</td>
<td>38</td>
<td>100</td>
</tr>
<tr>
<td>Age/years</td>
<td>&lt;= 25</td>
<td>5</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>26-35</td>
<td>8</td>
<td>16</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>36-45</td>
<td>17</td>
<td>34</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>46 - 55</td>
<td>16</td>
<td>32</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>56 and more than</td>
<td>4</td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>Level of education</td>
<td>Uneducated</td>
<td>8</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Read and write</td>
<td>6</td>
<td>12</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Primary school</td>
<td>15</td>
<td>30</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>Intermediate school</td>
<td>1</td>
<td>2</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Preparatory school</td>
<td>18</td>
<td>36</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>Bachelor’s Degree</td>
<td>2</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>50</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

This table show that the study results for study sample by their demographic data that indicate the majority of the study samples are male (62%) and age is (36-45) years old within age groups (34%). Regarding level of education is preparatory school the majority of the study sample (36%).
Table (2) Distribution of the Study sample (patients and clients) by their responses to the feasibility of activating electronic health care system

<table>
<thead>
<tr>
<th>Overall Domains</th>
<th>Rating and Scoring</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility Domain</td>
<td>Feasibility</td>
<td>45</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Some Extent Feasibility</td>
<td>5</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Not Feasibility</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

This table show that the study results that indicate overall assessment for the responses of study samples are most of their responses about feasibility domain is feasibility (90%) for client or patient about application of electronic health system.

Table (3) Distribution of the health care providers by their demographic data

<table>
<thead>
<tr>
<th>Demographic data</th>
<th>Rating and Scoring</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>41</td>
<td>63.1</td>
<td>63.1</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>24</td>
<td>36.9</td>
<td>100</td>
</tr>
<tr>
<td>Age/years</td>
<td>&lt;= 30</td>
<td>9</td>
<td>13.8</td>
<td>13.8</td>
</tr>
<tr>
<td></td>
<td>31-39</td>
<td>32</td>
<td>49.2</td>
<td>63.1</td>
</tr>
<tr>
<td></td>
<td>40-48</td>
<td>11</td>
<td>17</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>49+</td>
<td>13</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>Occupation</td>
<td>Physician</td>
<td>32</td>
<td>49.2</td>
<td>49.2</td>
</tr>
<tr>
<td></td>
<td>College nurse</td>
<td>7</td>
<td>10.8</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Medical assistance</td>
<td>14</td>
<td>21.5</td>
<td>81.5</td>
</tr>
<tr>
<td></td>
<td>Skill nurse</td>
<td>12</td>
<td>18.5</td>
<td>100</td>
</tr>
<tr>
<td>Years’ experience</td>
<td>&lt;= 8</td>
<td>20</td>
<td>30.8</td>
<td>30.8</td>
</tr>
<tr>
<td></td>
<td>9-17</td>
<td>23</td>
<td>35.4</td>
<td>66.2</td>
</tr>
<tr>
<td></td>
<td>18-26</td>
<td>16</td>
<td>24.6</td>
<td>90.8</td>
</tr>
<tr>
<td></td>
<td>27+</td>
<td>6</td>
<td>9.2</td>
<td>100</td>
</tr>
</tbody>
</table>

This table show that the study results for study sample by their demographic data that indicate the majority of the study samples are male (62%) and age is (31-39) years old within age groups (34%). Regarding occupations are their most from physician for application of the electronic health system (49.2%) and years’ experience for study sample (9-17) years (35.4%).

Table (4) Distribution of the Study sample (health care providers) about their responses to feasibility for activating electronic health care system

<table>
<thead>
<tr>
<th>Overall domains</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility domains</td>
<td>Some extent feasibility</td>
<td>11</td>
<td>16.9</td>
</tr>
<tr>
<td></td>
<td>Feasibility</td>
<td>54</td>
<td>83.1</td>
</tr>
<tr>
<td></td>
<td>Not feasibility</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>65</td>
<td>100</td>
</tr>
</tbody>
</table>

This table show that the study results that indicate overall assessment for the responses of study samples are most of their responses about feasibility domain is feasibility (83%) for healthcare providers about application of electronic health system.
Discussion

The study finding depict overall assessment of responses for study samples were most of their responses (clients or patients) about feasibility domain was there is feasibility about for application of electronic health system. A similar study that indicates the impact of e-Health technologies more effectively, a fresh way of thinking is required about how technology can be used to innovate health care through application e-health that increase feasibility and quality of health care services (5). Other study is consistence with the current study that indicate feasibility and quality of health care by use electronic health system as Moreover, eight RCTs found improvement in patient symptoms following e-Health tool use, especially in adolescent asthma patients. Furthermore, three RCTs showed that e-Health tools might improve patient self-efficacy and self-management of chronic disease. Little or no evidence was found to support the effectiveness of e-Health tools at improving medication recommendations and reconciliation by clinicians, medication-use behavior, health service utilization, adverse effects, quality of life, or patient satisfaction(6).

The study results that indicate overall assessment about the sample responses (health care providers) about feasibility domain was there is feasibility for application of electronic health system. These finding is consistence with that found use of e-Health requires a certain degree of technical proficiency from both health care professionals(7).

Conclusions

Conclusions for patients and clients results, most of the respondents were males with age’s range from (35 to 55) years old and with Primary and Preparatory education. Nearly all participants found that activating electronic health care system were feasibility.

As for Conclusions for health care providers results, most of the respondents were males with age’s range from (31 to 39) years old, most of the respondents were physicians with (8 to 17) years’ experience. Most of the participants found that activating electronic health care system was feasibility.

Conflict of Interest: Nil

Source of Funding: Self-funding

Ethical Clearance: taken from ethical committee in nursing college/University of Baghdad. All protocols were approved by Iraqi Ministry of Health.

References

Overview of Pulmonary Physiotherapy in Symptoms and Complication of COVID 19

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Abstract

COVID 19 or CORONA as we know it has not only become a global pandemic but a real threat to humanity which is proving itself as a third world war for the world. Everyone is talking about the basic preventive measures for fighting with this situation let it be proper hygiene, social distancing or allied healthcare measures. The basic symptoms of the covid-19 patients, the virus attacks healthy as well as immune-compromised individuals. The onset of virus starts from inhalation of droplets impregnated with virus which shows its effect on larynx and via it, progresses to lungs covering the respiratory system causing acute respiratory infections. Once in lungs it makes it as a strong hold on ground for further deterioration of immunity and respiratory functions which leads to fatal conditions like pneumonia acute respiratory distress syndromes. Now if by various respiratory physiotherapeutic practices if we can increase the strength of lungs it can actually increase the recovery of the patients with the aim of maintaining the bronchial hygiene and strengthening the respiratory muscles at various stages. Bronchial toileting, positioning can be helpful in dealing with complications like pneumonia and ARDS, where pursed lip breathing and ACBT can be helpful in dealing with breathlessness in early stages.

Keywords: COVID 19, Pneumonia, ARDS, Bronchial toileting, Positioning, Pursed lip Breathing, ACBT.

Introduction

The recent COVID -19 outbreaks has been declared as the global health emergency, India till date has already registered 909 covid-19 positive cases with 19 deaths and 40 cured cases¹. Indian government has taken various preventive measures against the virus and has taken a major step by locking down the whole country. Still we are getting various positive cases of covid-19¹. India is at a brink of entering at tertiary level. Various preventive measures for the people in India and intervention are getting implemented with the cases who are positive COVID 19. Since the complications of COVID 19 affects directly the respiratory system it has become important that the few strong measures should be highlighted for prevention and rehabilitation.

Method

Various international research articles have been reviewed for this study so that a standard protocol for the intervention of respiratory care should be inoculated as well as to establish the importance of respiratory therapy as the preventive measure.

Findings: The incubation period of covid-19 is from 1 day to 14th day the symptoms which are initially seen are fever, sore throat, dry cough, breathlessness and headache. The cases which have been resolved spontaneously are the one who were not having any secondary issues like diabetes, hypertension, any renal diseases, or who were not immune-suppressed³. However rest of them who are undergoing fatal complications like organ failure, septic shock, pneumonia & acute respiratory distress syndrome. Notably people who intensive care, are with multiple co morbidities including cerebro-vascular diseases, cardiovascular diseases and endocrine disease, digestive and respiratory disease⁴. More symptoms which were reported from ICU are severe dyspnoea, dizziness, anorexia and abdominal pain⁴. Few doctors from the city Jaipur, Rajasthan has
treated the patients with drugs used in HIV and they found it to be useful as no effective anti-viral treatment for covid-19 is available or researched till now. Whole community of doctors and pharmacist are rigorously researching for antidote of covid-19. On a temporary note the doctors are treating patients symptomatically via anti pyretic therapy, cough expectorants for non productive cough. Broad spectrum antibiotics are used in cases diagnosed with sepsis post covid-19 within an hour. Patients are also reporting with various fungal & bacterial infections are also treated with the same protocol.

According to World Health Organization acute respiratory syndrome is the first sign along with temperature => 38 degree Celsius(1). Preventive measures which taken are social distancing and regular hand hygiene where nobody is talking about bronchial hygiene. By maintaining bronchial hygiene we can save the patient from being collapsing(7).

Preventive measures in medical setups are nearest distance is 2 meters for 15 minutes as such patients are recorded with the temperature of more than 38 degree Celsius. No passive bronchial toileting can be indicated in acute respiratory infection or acute stages of patients with covid-19 pursed lip breathing (where the patient is asked to purse his lips and to breathe in via nose and exhale with the pursed lips), positioning and relaxation technique can help patient with symptoms of shortness of breath(7,9).

The Active Cycle of Breathing Technique consisted of 4–6 breathing control breaths, 3–4 thoracic expansion exercises and the forced expiration technique including 4–6 breathing control breaths combined with 2–3 huffs followed by cough(11). It can also be used as a respiratory therapy if the patient is in condition to perform as it has proved as a great measure to deal with respiratory failure(10), it can be a preventive measure for further stages of covid-19.

Where as in pneumonia along with covid-19 in acute stages bronchial drainage is contra indicated, the patient being ill & lung being totally consolidated and unproductive(7). Breathing exercises to maintain maximum ventilation in all areas of lung plus foot exercises (ankle pump) can be useful(12). Once entered the hepatization stage physiotherapy is to aid in cleaning the exudates is required(7).

In cases with ARDS of covid-19 frequent changes of positioning must be used in order to bring improvement in ventilation/perfusion ratio in certain parts of lungs and to prevent prolong dependency on any one section of lung(7). This improvement is only temporary but often leads to temporary improvement in oxygenation(7). Few study also have documented that prone positions significantly increase oxygenation and decrease driving pressure in patients with ARDS(13).

In general people can use various breathing exercise which can help in maintaining the bronchial hygiene and strength of respiratory system on a daily basis which will be a preventive measure on a larger note(8).

**Conclusion**

In such unprecedented situations which the whole world is facing, we as a developing country not only have to work on our primary health care system but simultaneously we have to develop the second line of health defense measures so that we not only reduces the risk of primary infections but also strengthen the respiratory system to fight this virus effectively in case one get infected be it a healthy individual or a immune-compromised one.

**Conflict of Interest:** No

**Source of Funding:** Self as no such major fund is involved

**Ethical Clearance:** As it is a review so no ethical clearance required

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Exploring the Factors Responsible for Delay in Delivery of Justice in India

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Abstract

Albert Einstein once said in relation to justice that, “in matters of truth and justice, there is no difference between large and small problems, for issues concerning the treatment of people are all the same”. The Preamble of the constitution of India states that,“We, the People of India having solemnly resolved to constitute India into a Sovereign, Socialist, Secular, Democratic, Republic and to secure to all its citizens; Justice, social, economic, political;Liberty of thought, expression, belief, faith and worship;Equality of status and opportunity; and to promote among them all;Fraternity, assuring the dignity of the individual and the unity and integrity of the nation.” But still after so many years of Independence we have several rules, regulations and mechanisms but those are not adequate to give justice. The establishing father of our constitution placed Justice at the highest level and India is considered to be the largest democracy still we are not getting fair justice. It is a still remain a demand and need to be resolved soon.

Keyword: Delay, Justice, Judiciary, Case Backlogs, Pendency.

Introduction

The Judiciary of India time and again emphasized the significance of the timely delivery of justice. The Supreme Court of India made it eloquent many years ago that “speedy trial is of essence to criminal justice and there can be no doubt that the delay in trial by itself constitutes denial of justice”.¹ In this research article the author after having extensive review of literature has identified and discussed with the help of supporting case laws and views of the judiciary few factors for causing delay in delivery of justice. They are as follows:

1. Delay in disposing cases is a hindrance to good governance, moral integrity and deterioration in standard of public life.

2. Practicing Advocates are the principal agents in causing the delay in delivery of justice.

3. Procedural laws create the scope for delay in disposal of cases.

4. Lack of adequate infrastructure (both physical and man power) is responsible for delay in disposal of cases.

5. Justice delivery system and rights of the individual are not supplementary to each other.

Good governance, moral integrity and deterioration in standard of public life: The first contention which states that, “Delay in disposing cases is a hindrance to good governance, moral integrity and deterioration in standard of public life.” There is a famous quote that, “Justice delayed is Justice denied”. This quote has no meaning if it cannot be given in proper time. At the same time, it is exposes that, if justice cannot be rendered on time what would be the use of such a multifaceted judicial system. Justice V D Tulzapurkar of the Supreme Courts has observed that, “if an independent judiciary is regarded as the heart of a republic, then the Indian republic is at present suffering from serious hear aliment.
In fact, the superior judiciary of the country has of late been under constant onslaughts, external as well as internal which are bound to cripple the health, welfare and progress of our body politic, as an ailing heart cannot ensure vigorous blood supply for the sound health of its people.” Thus a very perilous question arises is the faith in judiciary which is being condensed by the public because it affects the governance and standard of public life.

In the words of Dr. Cyrus Das “Justice is a consumer product and must therefore meet the test of confidence, reliability and dependability like any other product if it is to survive market scrutiny.2 It exists for the citizenry, ‘at whose service only the system of justice must work’. Judicial responsibility, accountability and independence are in every sense inseparable. They are and must be, embodied in the institution of the judiciary.” Now a day to get justice has become a dream of a litigant. Even though he gets it, it is not in his life, it may come after his life. This syndrome of getting justice is taking the judiciary far away from the faith and public life and creating a hindrance for good governance. In the landmark case, popularly known as Uphaar Tragedy Case, it took six years to establish that, 59 people have lost their life and more than 100 people have injured out of criminal negligence on the part of the cinema management and the Delhi Government. There are series of cases where prolonged delay defeats justice. Some of them are, in Safdar Hasmi Murder Case, for example, who was killed by political opponents, the criminals were punished after a long 15 years. In Tanduri Murder Case, the accused a Delhi Congress Leader Susil Sarma was convicted with death sentence after long 8 years 6 months. In Model Jesicalal Murder Case and Madhumita Sarma Murder Case, the accused persons were punished and justice rendered to the victims after a long legal scuffle.

**Role of Practicing Advocates:** The next important contention is “Practicing Advocates are the principal agents in causing the delay in delivery of justice.” The role of lawyers is the most imperative aspect in the justice delivery system. The strength and the promises of these legal professionals can make a revolution in the whole set-up. Regrettably, they are prominently responsible for triggering delay in the justice delivery system. There are many reasons such as “firstly they are not precise; they indulge in lengthy oral arguments just to impress their clients, secondly they take adjournments on frivolous grounds. The reasons range from death of the distant relative to family celebrations. With every adjournment the process becomes costly for the court and for the litigants; but the Lawyers get paid for their time and appearance. More often than not, lawyers are busy in another court. They have taken up more cases than they can handle, hence, adjournments are frequently sought. Thirdly many times it is seen that, lawyers do not prepare their cases. A better preparation of the brief is bound to increase the efficiency of the system. Fourthly, it is a trend that lawyers often resort to strikes. The reasons could be any-it ranges from misbehaviour with their colleague both inside court and outside the court to implementation of some enactment. The strike by lawyers against the decision of the government to enforce an amendment in the Civil Procedure Code is an example. This was very unfortunate because the main objective behind these amendments was to curtail delays in disposal of cases. However, the Supreme Court’s Judgement in Harish Uppals v Union of India, that lawyer had no right to go on strike or give a call for boycott not even a token strike, will certainly discourage the lawyer to go on strike unless they really had a strong cause.” Gandhiji has also in several times given light in these issues, in his words “throughout my career at the bar I never once departed from the strictest truth and honesty. The first thing which you must always bear in mind, if you would spiritualize the practice of law, is not to make your profession subservient to the interests of your purse, as is unfortunately but too often the case at present, but to use your profession for the service of your country. The fees charged by lawyers are unconscionable everywhere. I confess, I myself have charged what I would now call high fees. But even whilst I was engaged in my practice, let me tell you I never let my profession stand in the way of my public service. And there is another thing I would like to warn you against. In England, in South Africa, almost everywhere I have found that in the practice of their profession Lawyers are consciously or unconsciously ‘led into untruth for the sake of their clients. An eminent English Lawyer has gone so far as to say that it may even be the duty of a lawyer to defend a client whom he knows to be guilty. There I disagree. The duty of a lawyer is always to place before the judges and to help them to arrive at, the truth, never to prove the guilty as innocent (Young India, 22-12-1927).” Lord Denning also observed that, “the real reason for delay of lawyers is not slackness or dilatoriness, They are as a class most hardworking of all professional men. It often lies in their choice of priorities. Each case is important and must be dealt with. Each letter must be answered the same day...
or at any rate the next. A sudden call puts something else out of mind (Due Process of Law, 1980 edn. p. 89).” Therefore, the need of the hour is that, the lawyers must prove themselves to be the duty bound citizen of India by curing the diseases that are spread in the judiciary.

**Old Procedural laws:** Another important contention is “Procedural laws create the scope for delay in disposal of cases.” There are mainly two types of laws Substantive laws and Procedural Laws. The Substantive laws express the rights and liabilities. Nonetheless the procedural laws provide the instrument to implement these rights and liabilities. There are many laws still in force which are drafted since more than hundred years back. With present pace of the time and society those old laws are not getting their momentum to dispense and creating the biggest blockages in the whole judicial process. Therefore, the valuable time of the court is wasted on the arguments of jurisdiction, cause of action, sufficiency of notice, amendments of plaint and other procedural matters. The Law Commission of India has also time and again have highlighted this major problem through its 14th, 27th, 41st, 48th, 54th, 71st, 74th, 77th, 79th & 144th report for necessary reforms in the legislations. Moreover, there are certain difficult terms used in the legislation which is difficult to interpret and understand. Sometimes the judiciary takes time to construct the actual meaning of the term used in the legislation. Hence procedural laws need to be simplified, howsoever good the substantive laws may be to define the rights and liabilities but it won’t be fruitful if procedural rules are not simplified. The complexity and rigidity of the procedural laws are the pivotal reason the delay in judicial process. Our varied philosophies, languages, customary practises, religions, apparent in a variation of cases create an intimidating mission before the Judiciary. Adding to it, the statutes are so abundant and slackly drafted, ambiguous and capable of a manufacturing hundreds of interpretations.

**Inadequacy of Infrastructure:** Further, it is to be noted that “Lack of adequate infrastructure (both physical and man power) is responsible for delay in disposal of cases.” The next factor for delay is the inadequacy of judicial infrastructure in physical as well as in the judicial human resources. From the Ministry of Law and Justice, the data published which evident that, before the Supreme Court of India the approved strength is 31 but 25 numbers of Judges are working creating 6 vacant posts, in all the high courts the approved strength is 1079 but only 676 numbers of judges are working creating 403 numbers of vacant posts (Ministry of Law and Justice, Report Published, Vacancy as on, 01.02.2018). This crisis in judiciary is rising from time to time. Many times it has been advocated by law commission reports and through judicial statistics of annual reports, Judicial reform committees that, the strength of the judiciary can be increased by filling up the vacant post and also recruiting more numbers of judges to deal with overloaded case docket. But in a situation where even the prevailing approved strength is not filled to the maximum then obviously there will be a docket explosion with backlog of cases. It would be relevant to mention that as per the Constitutional structure of India, the selection and recruitment of judges in subordinate courts is the responsibility of State Governments and High Courts.

The Supreme Court has discussed and delivered in a series of cases highlighting this subject. This includes, *All India Judges Association Case*, where the Supreme Court directed that, “the number of judges should be increased, in the first instance by filling up the existing vacancies followed by an increase in the judge strength in a phased manner.” In an another case, *Malik Mazhar Sultan Case*, the Supreme Court “devised a process and time schedule to be followed by the High Courts and State Governments for the filling up of judicial vacancies.” The Supreme Court has issued a direction in the *Brij Mohan Lal Case* demanding that 10% added posts should be generated in the subordinate courts of judiciary.

The next vitiating element under this hypothesis is judicial infrastructure. The judiciary in India, mainly the subordinate judiciary are facing more trouble by existing infrastructure they are provided for dispensing of justice. As per the statistics collected from the various High Courts (As of June, 2014), there were 15,419 numbers of court halls or court rooms available for district and subordinate judiciary. Adding to it, 1003 numbers of court rooms were accessible in hired buildings. Now it is high time to relocate adequate judicial infrastructure as per the need system. This necessity is closely connected to the allocation of budgetary planning for the judiciary. The state is also required to make some eye marked steps by making judiciary even more powerful.

**Rights and Justice:** It is pertinent to mention here that “Justice delivery system and rights of the individual are not supplementary to each other.” The justice delivery system is dependent upon the
governance of a country. This ‘governance’ literally means steering. It refers to the processes and systems by which an organization or society operates; the processes by which decisions are made that define expectations, grant power, or verify performance. The duty is not only with judiciary but it also with the legislatures and the executives. A litigant in the whole process got squeezed and ruined by the intimidating factors. Former Chief Justice P N Bhagwati has said that, “I am pained to observe that the judicial system in the country on the verge of collapse. Our judicial system is crashing under the weight of arrears. It is trite saying that justice delayed in justice denied. We often utter this platitudeous phrase to express our indignation at the delay in disposal of cases but this indignation is only at an intellectual and superficial level. Those who are seeking justice in our own Courts have to wait patiently for year and years to gets justice. They have to pass through the labyrinth of one Court to another until their patience gets exhausted and they give up hope in utter despair. The only persons who benefit by the delay in our Courts are the dishonest who can with impunity avoid carrying out their legal obligations for years and each affluent person who obtains orders and stays or injunctions against Government and public authorities and then continues to enjoy the benefits of such stay or injunction for years, often at the cost of public interest.”

The constitutional mandate of safeguarding to all its citizens justice, social, economic and political, as guaranteed by the Preamble of the Constitution cannot be appreciated unless the three wings of the government i.e. legislature, executive and judiciary join together to find ways and means for providing to the citizens equal access to its justice delivery system. It is very common that in a criminal case to drag on for years the accused travels from the zone of “anguish” to the zone of “sympathy”. The witnesses are either won over by muscle or money power or they become sympathetic to the accused. As a result, they turn hostile and prosecution fails which certainly defeats the justice to the victims. Judiciary today is more deserving of public confidence than ever before. The judiciary has a special role to play in the task of achieving socio-economic goals enshrined in the Constitution while maintaining their aloofness and independence. The whole justice delivery system should be aware of the social changes in the task of achieving socio-economic justice for the people so that there will be reciprocity in rights and justices.

**Conclusion**

Justice-social, economic and political is a preambular principle of the Constitution of India. The pledge of equality before the law and equal protection of law lies at the spirit and heart of the judicial administration system. The judiciary is a co-equal stem of governance within the framework of the constitution and the courts are formed not only to deliver judgments or to adjudicate disputes between disputant parties, but also often designate normative doctrine in which institutions are bound by. These doctrines are not merely formulated, but recurrently redefined and adapted to suit changing times, even while assuring that, the hub Constitutional morals are avowed.

**Ethical Clearance:** Not required, as the research article is based on origin of factors responsible for delay in delivery of justice. The research is doctrinally undertaken.

**Source of Funding:** Self

**Conflict of Interest:** Nil

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Nursing Students’ Awareness, Knowledge and Attitudes on Child Abuse

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Abstract

Background/Objectives: This study was designed to explore nursing students’ awareness, knowledge, attitude on child abuse.

Method/Statistical analysis: The descriptive research design was conducted by administering online questionnaire to 299 nursing students at two university in J city. Data analysis was performed using SPSS WIN 25.0 program.

Findings: The mean scores of child abuse awareness, knowledge and attitude were 175.42±10.69, 3.89±1.83 and 28.94±6.57 respectively. Awareness, knowledge and attitude on child abuse were significantly positively correlated. In addition, the number of education on child abuse was positively correlated with awareness, knowledge and attitude on child abuse. Factors influencing child abuse attitude were frequency of child abuse education, awareness and knowledge (R² = .222).

Improvements/Applications: Based on this results, the development of education programs and guidelines to help nursing students detect child abuse and improve reporting rates is important. Thus, we suggest that nursing students be provided with educational protocol for detection, including report of child abuse.

Keywords: Child Abuse, Awareness, Knowledge, Attitudes, Nursing Students.

Introduction

In recent years, the number of child abuse cases has increased steadily with a total of 33,532 cases of suspected child abuse reported by 60 child protection agencies nationwide in 2018[1]. To prevent child abuse, which is continuously increasing, early detection of abuse cases can be the best way to save children from the greater damage. As the preventive measure against child abuse, the government is trying to find and protect abused children early and as part of this, the reporting system of child abuse can be found[2]. Reports by person in occupations that are likely to discover child abuse play an important role in prevention of child abuse[3].

Nurses are included in the report duty of 24 occupations specified in the Special Act on Punishment of Child Abuse Crimes, etc.and are obliged to report to child protection agencies or investigation agencies if they become aware or suspect of child abuse crimes while performing their duties[4]. In particular, nurses frequently come into contact with children of all ages due to their special characteristics such as immunization, growth test and development evaluation. Therefore, they should play the most important role in identifying and reporting abuse among occupations of reporters[5].

It has been reported that the obstacles that hinder child abuse reporting are the symptoms and signs of abuse or lack of knowledge of the reporting process and
legal process\textsuperscript{[6]}, attitudes that it was not serious enough to report or not help\textsuperscript{[7,8]} and perceptions such as the thought that it will have a negative effect on parents or children and that parenting is the parent’s own authority and cannot be interfered with\textsuperscript{[9,10]} are preventing report.

Even in this situation, education and guidelines on child abuse for nurses are insufficient. This condition is due to the lack of clear agreement on the role of nurses in child protection and prevention of abuse, as well as the limited view that the role is still needed only at the individual level or in some areas of care. However, considering that all nurses, as well as nurses specialized in child care, are required to report child abuse and this duty is one of the important roles of nurses, it is urgent to provide education and guidance for nurses. In addition, the need for accurate education should be further emphasized to consider that the reason for the low report rate of nurses is that they do not accurately identify abused children and that they are afraid of legal liability.

Nursing students as well as nurses should be subject to systematic education of child abuse. Therefore, we intend to use this study as a basis for improving awareness and early detection of child abuse and to prepare the basic data for education of nursing students.

The purpose of the study is as follows.

- To grasp the general characteristics of nursing students
- To grasp awareness, knowledge and attitudes on child abuse by nursing students.
- To grasp perception, knowledge and attitudes of child abuse according to the general characteristics of nursing students.
- To grasp the correlation between child abuse awareness, knowledge and attitude of nursing students.
- To identify the factors influencing the attitude of child abuse in nursing students.

**Method**

**Research Method:** This study is a descriptive research study to confirm perception, knowledge and attitude on child abuse in nursing students.

**Data collection:** The period of data collection was from February 15 to March 13, 2020. The online survey was conducted for 299 nursing college students who understood the purpose of the study and agreed to participate. For ethical consideration of the study subjects, data was collected after approval through the deliberation (IRB No: D **-2020-01-004-02) of Institutional Review Board (IRB) of D university. In addition, approval for using the tool in the study was obtained from its developer. The research assistant without conflict of interest explained the purpose, the method, the outcome and the potential problems of the study to the subjects and explained that they may wish to remain anonymous and refuse to participate if they do not. The survey was conducted after obtaining the informed consent from subjects who agreed to participate in the study and the complimentary product was provided in return.

**Research Tools:** The survey consisted of general characteristics and child abuse perception (38 questions)\textsuperscript{[11]}, knowledge (13 questions)\textsuperscript{[12]} and attitude (11 questions)\textsuperscript{[13]}.

**Awareness of Child Abuse:** In order to grasp the awareness of child abuse among college students, the child abuse awareness tool developed by Korea Institute for Health and Social Affairs (KIHASA) was used\textsuperscript{[11]}. This tool consists of 12 questions of physical abuse, 9 questions of mental abuse, 10 questions of neglect and 7 questions of sexual abuse. In addition, the higher the score from 0 “not abuse at all” to 4 “definite abuse” on 5-point Likert scale, the higher the awareness of child abuse. At the time of development, the tool’s Cronbach’s $\alpha$ was .95 and the tool’s Cronbach’s was 89 for this study.

**Knowledge of Child Abuse:** The knowledge of child abuse was measured using the knowledge scale of the Child Abuse Report Intention Scale (CARIS), totaling 13 questions\textsuperscript{[12]}. For each question, one point was given only for the correct answer and if the answer was ‘I don’t know’ or the answer was incorrect, it was treated as an incorrect answer and given a score of 0, then the scores for the 13 questions were combined and used as the knowledge score. The Cronbach’s $\alpha$ of the original tool was .61 and the Cronbach’s $\alpha$ of the tool for this study was .63.

**Attitudes towards Child Abuse:** Questions about child abuse attitudes are whether you think positively or negatively about the act of reporting. The measurement was performed by the knowledge scale of Fraser et al.
total of 11 items\(^{13}\). The response method of each item was composed of 5-point Likert form (1 point= not at all, 5 points= very so) and the scores for 11 items were added and used as the attitude score. The Cronbach’s α was .84 for the original tool and .80 for the tool of this study.

**Data analysis:** The collected data were analyzed with SPSS 25.0 and general characteristics of the subjects were identified by frequency, percentage, mean and standard deviation. According to characteristics of the main variables, recognition, knowledge and attitude were analyzed by t-test and ANOVA while the post-test being analyzed by Scheffe’ test. The correlation between variables was obtained by Pearson’s correlation coefficients. The multiple regression analysis was used to identify the extent and factors affecting the attitudes of child abuse.

**Result**

**Subject’s general characteristics:** The study subjects were 45 (15.1%) male students and 254 (84.9%) female students. Religious subjects were 113 (37.8) and non-religious 186 (62.2%). 19 (6.4%) had child abuse experience and 106 (35.5%) had experience in child abuse education. There were significant differences in knowledge of child abuse according to gender (\( t = 4.52, P = 0.034 \)), but the remaining variables showed no significant differences [Table 1].

**Subject’s Perception, Knowledge and Attitude on Child Abuse:** The perception of child abuse in nursing college students got 4.61±0.28 points and the physical abuse 4.75±0.22 points, mental abuse 4.67±0.40 points, neglect 4.18±0.61 points and sexual abuse 4.91±0.18 points. Child abuse knowledge 3.89±1.83 points while attitude attaining 28.94±6.57 points [Table 2].

**Table 1. Differences in Awareness, Knowledge and Attitude on Child Abuse according to General Characteristics (N = 299)**

| Variables                  | Categories | n(%)  | Awareness |  | Knowledge |  | Attitude |
|----------------------------|------------|-------|-----------|  |           |  |          |
|                            |            |       | Mean±SD   | t/F (p) | Mean±SD   | t/F (p) | Mean±SD   | t/F (p) |
| Gender                     | Male       | 45(15.1) | 173.29±11.71 | 2.12(.146) | 4.42±2.36 | .05(.148) | 28.51±8.51 | .22(.636) |
|                            | Female     | 254(84.9) | 175.80±10.47 | 3.80±1.70 |           |           | 29.02±6.18 |          |
| Religion                   | Yes        | 113(37.8) | 176.69±10.97 | 2.55(.111) | 4.15±1.91 | .11(.111) | 29.17±7.36 | .21(.640) |
|                            | No         | 186(62.2) | 174.66±10.46 | 3.73±1.77 |           |           | 28.80±6.05 |          |
| Experience of being abused | Yes        | 19(6.4)  | 172.58±10.06 | 1.44(.231) | 3.79±1.78 | .06(.806) | 29.00±6.60 | 1.44(.231) |
|                            | No         | 280(93.6) | 175.62±10.72 | 3.90±1.83 |           |           | 28.94±6.58 |          |
| Experience of education    | Yes        | 106(35.5) | 176.92±11.22 | 3.21(.074) | 3.86±1.61 | .04(.828) | 29.24±6.23 | .33(.565) |
|                            | No         | 193(64.5) | 174.61±10.32 | 3.91±1.94 |           |           | 28.78±6.75 |          |
| Frequency of child abuse   | 0          | 195(65.2) | 174.73±10.35 | 3.92±1.94 |           |           | 28.72±6.75 |          |
|                            | 1          | 37(12.4)  | 176.73±11.21 | 4.16±1.96 |           |           | 27.38±6.37 |          |
|                            | 2          | 36(12.0)  | 175.78±11.98 | 3.78±1.26 | .64(.646) |           | 30.33±4.94 | 2.04(.088) |
|                            | 3          | 26(8.4)   | 178.04±10.06 | 3.44±1.53 |           |           | 31.44±6.55 |          |
|                            | 4          | 5(2.0)    | 176.83±13.67 | 3.83±1.47 |           |           | 27.00±8.09 |          |

**Table 2. Nursing Students’ Awareness, Knowledge and Attitude on Child Abuse (N = 299)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Categories</th>
<th>Mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td>Total</td>
<td>175.4±10.69</td>
</tr>
<tr>
<td></td>
<td>Physical</td>
<td>4.6±0.28</td>
</tr>
<tr>
<td></td>
<td>Emotional</td>
<td>4.75±0.22</td>
</tr>
<tr>
<td></td>
<td>Neglect</td>
<td>4.67±0.40</td>
</tr>
<tr>
<td></td>
<td>Sexual</td>
<td>4.18±0.61</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td>4.91±0.18</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td>28.94±6.57</td>
</tr>
</tbody>
</table>
Correlation between the number of education, perceptions, knowledge and attitudes on the subject’s child abuse: The number of education related to child abuse was found to be related to perception ($r=.38, p=.003$), knowledge ($r=.45, p=.001$) and attitude ($r=.28, p=.004$). Recognition was confirmed to be related to knowledge ($r=.49, p=.001$) and attitude ($r=.15, p=.007$). Knowledge and attitude also showed the positive correlation ($r=.35, p=.003$) (Table 3).

Table 3. Correlations among the Frequency of Child Abuse Related Education, Child Abuse Awareness, Knowledge and Attitude (N=299)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency of child abuse education</th>
<th>Awareness</th>
<th>Knowledge</th>
<th>Attitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of child abuse</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>education</td>
<td></td>
<td>.38(.003) *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness</td>
<td></td>
<td></td>
<td>.49(.001) *</td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td>.28(.004) *</td>
<td>.15(.007) *</td>
<td>.35(.003) *</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Predicting factors of child abuse attitudes in subjects: The stepwise multiple regression analysis was conducted to identify the predictors of child abuse attitudes. As a result of the analysis, the number of education, the awareness and the knowledge were found to be influential variables in the attitude of child abuse. Especially, the number of child abuse education showed high F value. As a result of the final analysis, it was found that the number of education, the awareness and the knowledge accounted for 22.2% of attitudes toward child abuse ($R^2 .222, p < .001$) (Table 4).

Table 4. Factors Influencing Child Abuse Attitude (N=299)

<table>
<thead>
<tr>
<th>Variables</th>
<th>$\beta$</th>
<th>Adjusted R2</th>
<th>t</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of child abuse</td>
<td>.349</td>
<td>.122</td>
<td>1.039</td>
<td>7.768</td>
<td>.048*</td>
</tr>
<tr>
<td>education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awareness</td>
<td>.104</td>
<td>.137</td>
<td>1.231</td>
<td>1.958</td>
<td>.19**</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td>-0.424</td>
<td>2.512</td>
<td>&lt;.001**</td>
</tr>
</tbody>
</table>

Discussion

This study attempted to grasp awareness, knowledge and attitudes of child abuse in nursing students and to confirm the correlation between these variables. First, the child abuse awareness score was 175.42 points. Child abuse awareness is known to be influenced by gender, child abuse experience and child abuse prevention education[14,15]. In this study, it was found that the score was affected by gender. When analyzing child abuse perception by type, the perception of sexual abuse was the highest with the score of 4.91 out of 5, followed by physical abuse, mental abuse and neglect. The perception of child abuse also appeared in the same order as in the study of Ha[14] and Moon[15] using the same tool.

The level of knowledge on child abuse was 3.8 out of 13. Comprehensive research results of Lazenbatt and Freeman[6] for nurses show low overall knowledge of child abuse in nursing students. In addition, the ability to select abused children and the perception of professional content related to legal reporting systems were insufficient. Professional knowledge of child abuse with reporting method should be provided to nursing students as the systematic educational program.

The attitude on child abuse was 28.9 points. Nursing
students were found to have a high degree of professional responsibility for abused children. In other words, they tended to agree that they should advocate for abused children and that they should work to identify and discover abused children in clinical trials [10,13,16]. We need to avoid ambiguous decisions and make reporting more responsible by planning specific strategies for child abuse.

Recognition, knowledge and attitude showed the significant statistical correlation with education frequency as a result of examining the correlation result of child abuse awareness, knowledge, attitudes and the frequency of child abuse-related education. This result is similar to the one of the previous study [17], in which the number of education related to child abuse has the significant effect on attitudes. In this study, it can be confirmed that the attitude toward child abuse can be improved as the experience of education increases. In addition, the perception of child abuse showed the significant positive correlation with knowledge along with attitude. Considering the results of previous studies [17] that the prevention education of child abuse influenced knowledge and attitude through mediation of child abuse perception, education related to child abuse should be provided as the program that can increase the awareness of obligatory medical reporter and influence reporting.

Lastly, the number of education, the awareness and the knowledge about child abuse were influential variables as factors affecting the attitude of child abuse in nursing students. If these factors are considered, the development of the curriculum or the program related to the reporting obligation to prevent child abuse should be prepared in nursing college curriculum to correct knowledge and attitudes about child abuse.

**Conclusion**

This study explored perceptions, knowledge, attitudes and correlations of child abuse among pre-medical reporter, nursing students. The general characteristics of nursing students did not differ in their perceptions and attitudes toward child abuse. In the gender, the child abuse knowledge scores were significantly higher. The awareness of child abuse was highest in the order of sexual, physical, mental and neglect by type. The higher the number of child abuse education, the higher recognition, knowledge and attitude. In addition, the number of education, the awareness and the knowledge on child abuse were found to have the impact on child abuse attitudes.

This study was conducted on nursing college students and has limitations in the generalization of research results. However, the results of this study provide educational and practical usefulness to increase awareness, knowledge and attitudes of child abuse by preliminary medical reporters and the following suggestions are made. First, it is necessary to provide child abuse education repeatedly in the education process of preliminary medical reporter. Second, we suggest the follow-up study that compares and explores the differences and impacts of child abuse perceptions as well as reporting intentions in nurses and health teachers working in clinical practice.

**Ethical Clearance:** For ethical consideration of the study subjects, data was collected after approval through the deliberation (IRB No: D **-2020-01-004-02) of Institutional Review Board (IRB) of D university. The informed consent was obtained from the subjects before data collection. Confidentiality of data collected was ensured.

**Source of Funding:** Self-finance

**Conflict of Interest:** Nothing specific-can use the study findings with proper citation of authors name.

**References**


Health Promotion Strategy for Improving Men’s Participation in Family Planning Program in the Underdeveloped Areas, Borders and Islands and Poor Urban Areas

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Abstract

The participation of men in family planning in Indonesia is still very low, where the men who use the Medical Male Operations (MOP) method are only 0.2% while the condom use is 3.1% (IDHS 2017), Likewise in East Java only 3.7% of the total new KB participants in 2019. The conditions most in need of attention are in underdeveloped areas, borders, islands and poor areas, which are in dire need of appropriate strategic breakthroughs. The conditions most in need of attention are underdeveloped areas, borders, islands and poor areas, which are in need of appropriate strategic breakthroughs. Strengthen the advocacy efforts for new regional leaders so that the family planning program can continue to run in the regencies/cities without having to start from zero again, provide training to male family planning motivators so that the information provided to prospective acceptors is more detailed and accurate and follows up the results of training of medical personnel and midwives.

Keyword: Men’s participation in family planning, Health promotion strategies.

Introduction

The development of a nation is closely related to population problems. One indicator of the success of the nation’s development is said to be achieved if it is supported by the subject of development, namely residents who have optimal quantity and quality.¹

East Java Province is used as a pillar and a buffer for the implementation of the national family planning program which is run by all provinces in Indonesia. Even though it has been called a buffer zone, the challenges of implementing the family planning program remain.² The population of East Java which is predicted to reach 40 million this year and also the decentralized system is a small obstacle to the implementation of the program in East Java Province.³

FP programs that have been running for almost 40 years in Indonesia must pay more attention to the issues of justice and gender equality after the ratification of the Cairo Declaration.⁴ This certainly also had an impact on the family planning program. The level of family planning participation in general is still dominated by women. The number of male FP participation is still very low. The active participants of male birth control using the Medical Operation Method for men (MOP) are only 0.2% while the use of condoms is 3.1% while in East Java the numbers are only 3.7% of the total new FP participants until November 2019. Thus the number of male family planning participation in the province of East Java is still low.

In order to deal with the problem of male birth control, the BKKBN has a Directorate of Family Planning Participation in the Regional Path and Special Targets. This directorate was formed to increase male participation in family planning programs and also reach special areas that are included in underdeveloped, border and island areas and also urban poor areas.⁵

Based on the various reasons above, an analysis of the Family Planning Program for Men in Underdeveloped, Border and Islands and urban poor areas is needed in the BKKBN Representative of East Java Province to
see efforts to increase the participation of male family planning, especially in the province of East Java.

**Method**

This research uses quantitative research method with a secondary data analysis approach. This study uses data sourced from the BKKBN monthly report and also the policy for the implementation of the BKKBN Men’s FP. Analysis was also carried out on policies relating to the implementation of male birth control in East Java, specifically at Underdeveloped, Border and Island areas (UABI) and also urban poor areas.

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**Result**

**Overview of Achievement of Men’s FP Program in Underdeveloped, Border and Islands and Urban Poor Areas in East Java Province:** As one of the buffer zones of family planning programs in Indonesia, East Java Province through its BKKBN Representative routinely reports on the achievements of the program each month, including the Male FP program.

![Figure 1: Trends in Active Family Planning Participants in UABI and Urban Poor Areas in East Java Province 2019](image-url)

Figure 1 show that the tendency of PA is quite stable, but in the condom method there was a decrease in users in July. This shows an increase in the rate of discontinuation of condom contraception in July.
Figure 2: Results of Achievement of New Male FP Participants in UABI and Urban Poor Areas in East Java Against 2019’s Targets

Targets data used is MOP and Condom PPM data that must be achieved by every Regency/City in East Java, including UABI and urban poor areas. PPM data used is MOP and Condom PPM data that must be achieved by every Regency/City in East Java, including UABI and urban poor areas. Achievement results that continue to increase are quite good and indicate improvements in each month, but when viewed from the figures, the results are still unsatisfactory especially in the MOP method which until the end of the year only reached 28.2% of the target set by the central government.

Discussion

Health Promotion Strategy: Health promotion aims to promote health programs in order to realize a new Indonesian society that is cultured with a clean and healthy life and participates directly in the health movement. To achieve the goal of realizing health promotion, a good strategy is needed. Strategy is a way to achieve and realize the vision and mission of health effectively and efficiently (7).

To achieve the goal of realizing health promotion, a good strategy is needed. Strategy is a way to achieve and realize the vision and mission of health effectively and efficiently. Decree of the Minister of Health Number 1193/Menkes/SK/X/2004 regarding the National Health Promotion policy and Decree of the Minister of Health Number 1114/Menkes/SK/VII/2005 Regarding the Guidelines on the Implementation of Health Promotion in the Regions (8). The strategies needed to realize health promotion are as follows:

Advocacy: Advocacy is an effort or a strategic and planned process with the aim of getting commitment and support from the parties concerned (9). The aim of this health advocacy is to increase the number of health-oriented public policies, to increase public opinion in supporting health and to solve health problems together and integrated with regional health development through partnerships and the support and care of regional leaders (10). The targets of health advocacy are decision makers as well as policies at the provincial, city or district level, as well as at the central level. For health advocacy activities, it consists of various forms, both formal and informal.
Government support for the Men’s FP program is one of them manifested by the support of policies that favor the implementation of the Men’s FP in UABI and urban poor areas.(11)

**Supporting policies include:**

1. Constitution No. 52 Year 2009 About Population Development and Family Development
2. Constitution No. 1 Tahun 2014 about Changes of Constitution No. 27 Year 2007 About Management of Coastal Areas and Small Islands.
3. Presidential Republic of Indonesia Regulation No. 78 Year 2005 About the Management of the Outermost Islands
5. Regulation of the Head No.10 Year 2018 About the Implementation of Mobile Family Planning Services
7. Presidential Republic of Indonesia Regulation No. 82 Year 2018 regarding Health Insurance in article 52 describes health services not guaranteed by Health Insurance.

BKKBN Representatives of East Java Province each year formulate a Work Plan which will later be advocated to the Central BKKBN in order to get support and approval. Besides that, they also routinely hold Regional Work Meetings with all representatives of Regencies/Cities in East Java Province to discuss work programs and plans for the next year’s activities.

**Social Support:** Health promotion will be easy to do if you get social support. Social support is an activity with the aim of seeking support from various elements (community leaders) to bridge the health program implementers with the community as recipients of the health program.(12) The main target of social support or community development is community leaders at various levels (secondary targets), while for other social support or community development targets consist of health care groups, religious leaders, health professionals, health service institutions, mass organizations, community leaders, mass media groups and non-governmental organizations.(13)

One of the ways to bring access closer is manifested by the existence of mobile family planning services. This mobile family planning service is based on conditions in regions where health facilities are not yet available that meet the requirements, there are no competent medical personnel available, areas that require assistance with mobile family planning services such as in the context of social service activities and the like.(12)

BKKBN Representatives of East Java Province through cooperation in the Field of FP-RH have routinely held Mobile FP Services through service visits and also use mobile FP service facilities or commonly referred to as “Muyan KB”.

One of the most important things in conducting Mobile Family Planning Services is the presence of competent doctors or midwives. The presence of competent medical personnel is very influential in service in the field, so this must continue to be optimized. Of 161 MOP doctors/providers who have been trained in 2012-2015, only 34 doctors/providers have been able to serve MOP, in other words only 21%. This certainly will greatly affect the achievement of male birth control especially with the MOP method in East Java.

**Community Empowerment:** Empowerment is a process of providing information to families or groups and individuals continuously and continually ambungan by following the development of the community and the process of helping the community so that the community changes from being ignorant to knowing or aware and from knowing to being willing and from wanting to be able to implementing the introduced health program.(14)

There are two health promotion objectives that are linked to community empowerment. First, empowerment is a way in which the community is expected to be able to carry out their lives. Second, it can improve healthy living behavior in the community and third, it can increase the role of the community in health efforts.(10)

Community empowerment related to male family planning is a motivator for male family planning and also male family planning groups. Male Family Planning Motivators are those who have used MOP contraception method in their environment and are expected to become MOP acceptors in their experience and can invite people around to keep the same things. The Male FP Motivator is in charge of communicating the existing
Male FP Program to the people in his neighborhood, providing information related to the Male FP Program and educating the surrounding community about the same thing. The male family planning motivator is also an extension of the BKKBN in the community so that its presence can be felt by all levels of society, especially those in disadvantaged areas, borders and islands as well as urban poor areas. At present, East Java Province has 199 FP Family Motivators.

It is different only with the male FP group, this group is an association of men who have used the MOP contraceptive method. The purpose of the formation of this group is so that fellow acceptors can update information related to the impacts and effects of using MOP method. In addition, the acceptor can also find answers to the obstacles that might occur in him. At present, East Java Province has 127 male family planning groups.

Partnership: In empowerment, community development and advocacy, the principles of partnership must be upheld\(^\text{(15)}\). Partnerships are developed between health workers and their targets, and developed because of the awareness that to improve the effectiveness of health promotion. Health workers must collaborate with various related parties, such as professional groups, religious leaders, NGOs, mass media, etc.

Partners are needed in the continuity of the family planning program. Therefore, the BKKBN collaborates with several parties to support the acceleration of achieving the KB program targets. These institutions include:

a. Partnership with Indonesian National Army

b. Ministry of Villages Development of Underdeveloped Regions and Transmigration Synergy of the KKBPK Program in the Village Fund for the KB Program; The use of Village Funds in supporting the availability of KB Extension Offices and Improving the economy through the productive capital of the local community; KB CIE and Reproductive Health in Disadvantaged Areas and Transmigration by involving transmigration instructors at the time of debriefing prospective transmigrants; Family Planning and Reproductive Health services in health facilities in transmigration areas.

c. Ministry of Maritime Affairs and Fisheries: Conducting advocacy and IEC and KKBPK program services and the movement to promote fish eating for the community; Community empowerment and resource utilization on the coast and small islands towards prosperous families, especially in the FP Village; Exchange of data and information; Joint utilization of supporting facilities and infrastructure; Increasing access and quality of family planning and family planning; Facilitating increased use of long-term contraceptive method through fisheries counselors; Promote family planning and family planning programs and family planning services.

d. Partnership with Interfaith Forum for Religion Cares About Family Welfare and Population

e. Perkumpulan Kontrasepsi Mantap Indonesia (PKMI) Vasectomy and Tubectomy training for doctors; Provide medical assistance/visiting specialists during vasectomy services; Giving material for male birth control Ikatan

f. Partnership with Indonesian Urologist

g. Indonesian Population Coalition East Java Provinceto assist scientific studies of advocacy and policy analysis

h. Indonesian Ulama Council, to assistance about the rumor of a vasectomy male birth control

i. National Disaster Management Agency IEC about FP and Health; Reproduction through information media; Provision of contraceptive devices and medicines in disaster conditions; Family Planning Services in the affected areas.

j. Head of Regional Apparatus Organization FP

If described the health promotion strategy in increasing men’s participation in family planning is as follows (8):

\[^\text{(15)}\]
Figure 3: Health Promotion Strategy Chart

Conclusions

The results of the analysis of the Men’s Family Planning Program in Underdeveloped, Border and Islands and urban poor areas in the BKKBN Representative of East Java Province, can be concluded as follows:

1. Advocacy has been carried out with the support of policies from the central government, cross-sectoral, as well as the head of the agency namely BKKBN. BKKBN has also routinely drawn up work plans and held regional work meetings.

2. Community development has been carried out by bringing access to family planning services closer to areas in need (Underdeveloped, Border and Islands and urban poor areas). Efforts made by way of service visits and using mobile FP service facilities (Muyan KB).

3. Community empowerment is done through the formation of motivators for male birth control and also for male birth control groups.

4. Partnerships are needed to optimize efforts to improve men’s participation in family planning, especially in specific areas. Partnerships that have been established, among others professional groups, religious leaders, NGOs, mass media, etc.

Recommendation:

1. Strengthen advocacy efforts for new regional leader candidates so that the KB program can continue to run in the Regency/City without having to start from scratch again.

2. Provide training to male family planning motivators so that the information provided to prospective acceptors is more detailed and accurate.

3. Register the reasons for doctors/providers who have been trained but do not want to provide services so they can be followed up again.

Conflict of Interest: The authors have no conflict of interest with the material presented in this paper.

Sources Of Funding: NILL

Ethical Clearance: NILL. My paper is an idea and policy analysis to solve population problems, without any treatment to the respondent/informant.

Reference


5. National Population and Family Planning Board Indonesia, Statistical Indonesia, Ministry of Health, ICF. Indonesia Demographic and Health Survey.


Epidemiology of Fatal Road Traffic Accidents: A Six Year Retrospective Study in the Medico legal Centre of a Tertiary Care Health Set Up in Western Maharashtra

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Abstract

Road Traffic Accident (RTA) is a public health concern globally. Rapid urbanisation and increase in the number of motor vehicles, lack of discipline and violation of traffic regulations has led to a rapid rise in the deaths in vulnerable road users. A retrospective study was undertaken in the autopsy centre of a tertiary care hospital to observe the pattern and trends of deaths between 2013-2018 due to RTAs. Out of 248 RTA cases analysed in this study, 75.4% were male and 24.6% were female. The most vulnerable age group was 21-40 years in both two-wheeler and four-wheeler accidents while in pedestrians it was 41-50 years. High rate of accidents was seen during summer in afternoon in cases of pedestrians as well as motor vehicle occupants and in the evening after 6 PM in two-wheeler motorcyclists. Observation of the pattern of head injuries showed fracture of the skull was a common occurrence in two and four-wheeler accidents whereas a greater number of pedestrians reported no skull fracture. Non helmet users suffered higher mortality in the age group of 21-30 years. Subdural haemorrhage caused maximum deaths in two-wheeler motorcyclists and pedestrians while sub arachnoid haemorrhage was seen in four-wheeler accidents. Our study agreed with the WHO report of 2018 and various other studies from India and abroad. Increased number of fatalities was found to occur at a particular time of the day with seasonal preference. Two-wheeler motorcyclists without a helmet suffered maximum deaths. Real time analysis of data in various parts of the country would help in ensuring safe road user practices.

Keywords: Road traffic accidents, head injuries, helmets.

Introduction

Road Traffic Accident (RTA) remains a major public health concern at a national level and worldwide. The World Health Organisation (WHO) in its Global Status Report on Road Safety 20181 stated that 1.35 million people are killed in road traffic accidents worldwide with 90% of casualties taking place in the developing countries. As per the annual report “Road Accidents in India 2018 “by the Ministry of Road Transport and Highways2, a total of 1,51,417 deaths were attributed to traffic accidents on the road. India is signatory to the Brasilia Declaration to half global deaths due to RTAs by 2020. Though the country has been trying to honour the commitments to minimise the loss of young productive lives by enactment of Motor Vehicle Amendment Act 20193 the fatalities continue to rise due to the lack of discipline and responsible attitude amongst road users.

The most vulnerable of the road users are the pedestrians, cyclists and motorcyclists. Risk factors in them include speed, drunken drivers or pedestrians, neglecting road rules, failure to use helmets and seatbelts.
The victims of RTAs die due to head injuries, spinal injuries, crush injuries, abdominal injuries. Head injuries are the leading cause of trauma and death especially in motorised vehicles. Traumatic skull and brain injury manifests in these victims as Extradural, Subdural and Sub arachnoid Haemorrhage (EDH, SDH and SAH) with or without a fracture. Usage of standardised helmets by cyclists and motorised two and three wheelers reduce the percentage of head injuries and thus death in these group of road users.

NCRB in their 2014 report\(^4\) declares, ‘it is of vital consequence to understand the tendency and patterns of traffic accidents’. This study tried to analyse the patterns and trends in road traffic accidents over a period of time in an urban part of the country to aid in the data collection for a causative real time analysis of road accidents.

**Material and Method**

A retrospective observational study of deaths due to fatal road traffic accidents brought to the medico legal centre of a tertiary care setup in Western Maharashtra between 2013 and 2018 was undertaken. A total of 248 cases involving two-wheeler and four-wheeler motor vehicle occupants and pedestrians were included in the study. For the purpose of this study, an RTA was defined as an accident on the road between two or more objects, one of which must be any type of moving vehicle.

Data collected from autopsy reports was analysed according to the kind of road users (pedestrian, two-wheeler motorcyclists and four-wheeler motor vehicle occupants). Age & sex wise distribution, time and season of the mishap, use of helmets and the pattern of cranio-cerebral trauma were studied. Medico legal post-mortem records and fatal case documents of the victims were referred to for collecting information and cross checked. Data was analysed by using Microsoft office excel.

**Results**

During the study period, total number of autopsies performed was 1467, of which the number of RTAs was 248 (16.9%). Of these, 187 were male victims (75.4%) and 61 were female (24.6%). The male/female ratio was approximately 3:1. Number of pedestrian fatalities was 45 (18.2%) and fatalities by two-wheeler and four-wheeler motor vehicles were 144 (58.1%) and 59 (23.8%) respectively. [Table 1].

<table>
<thead>
<tr>
<th>Road Users</th>
<th>No. of cases out of 248</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>187</td>
<td>75.4</td>
</tr>
<tr>
<td>Female</td>
<td>61</td>
<td>24.6</td>
</tr>
<tr>
<td>Two-wheeler motorcyclists</td>
<td>144</td>
<td>58.1</td>
</tr>
<tr>
<td>Four-wheeler occupants</td>
<td>59</td>
<td>23.8</td>
</tr>
<tr>
<td>Pedestrian</td>
<td>45</td>
<td>18.2</td>
</tr>
</tbody>
</table>

Highest number of RTA fatalities was recorded in the age group of 21-40 years in both two-wheeler (41.9% n=65) and four-wheeler (35.9% n=14) occupants while in pedestrians it was in the 41-50-year age group. (20.4% n=11). Lowest number was noted in elderly above 80 years of age (1.8% n=1) [Table 2].

<table>
<thead>
<tr>
<th>Age Group (yrs)</th>
<th>Two-wheeler</th>
<th>Four-wheeler</th>
<th>Pedestrian</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>0-10</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11-20</td>
<td>23</td>
<td>14.8</td>
<td>1</td>
</tr>
<tr>
<td>21-30</td>
<td>65</td>
<td>41.9</td>
<td>12</td>
</tr>
</tbody>
</table>
When the time of the accident was taken into consideration, large number of RTA cases (43.8%, n=68) were reported to occur by two-wheelers between 6 PM to 12 midnight. Pedestrian (44.4% n=24) and four-wheeler motor vehicles (41% n=16) accidents were found to occur from 12 noon to 6 O’clock in the evening. [Table 3].

Summer (36.3%, n=90) accounted for the maximum number of RTAs followed by rainy and winter seasons (31.9%, n=79).

### Table 3: Time of Accident

<table>
<thead>
<tr>
<th>Time Interval (hours)</th>
<th>Two-wheeler</th>
<th>Four-wheeler</th>
<th>Pedestrian</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>0600-1200</td>
<td>45</td>
<td>29.0</td>
<td>14</td>
</tr>
<tr>
<td>1200-1800</td>
<td>37</td>
<td>23.8</td>
<td>16</td>
</tr>
<tr>
<td>1800-0000</td>
<td>68</td>
<td>43.8</td>
<td>7</td>
</tr>
<tr>
<td>0000-0600</td>
<td>5</td>
<td>3.2</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>155</td>
<td></td>
<td>39</td>
</tr>
</tbody>
</table>

Age group between 21-30 years has the highest death rate and most of these victims did not use helmets. Helmets were reportedly used by a majority of the individuals in the age group of 31-40 years [Table 4]
Fracture of the skull was a common occurrence in two and four-wheeler accidents whereas a greater number of pedestrians reported no skull fracture. Communal fracture (29% n=45) followed by linear fracture (23.9% n=37) was predominantly seen in two-wheeler RTAs and 29% (n=45) of the cases were seen to have no fracture of the skull. Linear skull fractures (25.6% n=10) were maximum in four-wheeler motor vehicle occupants followed by basal fracture (17.9% n=7) and 33.3% (n=13) had no evidence of fracture. 42.6% (n=23) cases of pedestrians had no fracture of the skull with 20.3% (n=11) cases having a comminuted fracture followed by 16.7% (n=9) cases having a linear fracture. [Table 5].

### Table 5: Types of Skull fractures

<table>
<thead>
<tr>
<th>Types of skull fracture</th>
<th>Two-wheeler</th>
<th>Four-wheeler</th>
<th>Pedestrian</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>Linear</td>
<td>37</td>
<td>23.9</td>
<td>10</td>
</tr>
<tr>
<td>Comminal</td>
<td>45</td>
<td>29</td>
<td>4</td>
</tr>
<tr>
<td>Depressed</td>
<td>7</td>
<td>4.5</td>
<td>2</td>
</tr>
<tr>
<td>Sutural</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Basal Fracture</td>
<td>8</td>
<td>5.1</td>
<td>7</td>
</tr>
<tr>
<td>Basal + Linear</td>
<td>3</td>
<td>1.9</td>
<td>3</td>
</tr>
<tr>
<td>Crush Fracture of Skull</td>
<td>10</td>
<td>6.5</td>
<td>0</td>
</tr>
<tr>
<td>No Fracture</td>
<td>45</td>
<td>29</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>155</strong></td>
<td><strong>39</strong></td>
<td><strong>54</strong></td>
</tr>
</tbody>
</table>

Traumatic brain injury was observed in all victims of RTAs irrespective of the category of road user. In the two-wheeler motorcyclists, 69.8% were found to have subdural haemorrhage (SDH) followed by extradural haemorrhage (EDH) in 66.6% of cases. Subarachnoid haemorrhage (SAH) was seen in 48.9% of cases. In all these cases intracranial haemorrhage was found with no evidence of fracture of skull. In cases of two-wheeler motorcyclists with skull fracture, SDH was found in 26.6% cases, EDH in 33.3% and SAH in 36.1% cases. In the four-wheeler occupants EDH was not seen on autopsy. SDH accounted for the maximum cases in both skull with (58.8%) and without fracture (41.1%). SAH was seen in 66.7% of cases with skull fracture and 33.3% cases without fracture. In pedestrians without skull fracture 85.7% of SDH, 75% of EDH and 64.2% of SAH was seen and in those with skull fractures maximum number of cases had SAH (35.7%) followed by EDH (25%) and SDH (14.2%) [Table 6].

### Table 6: Intra Cranial Haemorrhages

<table>
<thead>
<tr>
<th>Motor vehicles</th>
<th>Head Injury</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-wheeler</td>
<td>SDH</td>
<td>EDH</td>
</tr>
<tr>
<td>Skull without Fracture</td>
<td>2</td>
<td>97</td>
</tr>
<tr>
<td>Skull with Fracture</td>
<td>1</td>
<td>37</td>
</tr>
<tr>
<td>Four-wheeler</td>
<td>SDH</td>
<td>EDH</td>
</tr>
<tr>
<td>Skull without Fracture</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Skull with Fracture</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Pedestrian</td>
<td>EDH</td>
<td>SDH</td>
</tr>
<tr>
<td>Skull without Fracture</td>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>Skull with Fracture</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Discussion

We observed that the most vulnerable category of road users in our study were males probably due to gender ratio on the streets. WHO in their gender wise comparison in RTAs between 2016-2018 revealed a much higher ratio of males (86%) compared to our study. Male preponderance is noted in other studies in various parts of India by Kumar A et al. and Saksham et al. Singh D et al. observed a ratio of 3:2 between the genders.

Recent report by WHO show that two-wheelers constitute the maximum share of road crash deaths (36.6%) in the year 2018. Four wheelers are the next higher contributors (16.6%) followed by pedestrians (15%). Similar findings were found by us with Pathak SM et al and Kumar. S et al substantiating us in their studies while Singh et al and Toro et al found maximum deaths in pedestrians.

21-40 year old individuals suffered the maximum fatalities in our study which is consistent with various other studies available from India. In its report the WHO observes that age profile with maximum fatalities between 18-45 years remain constant from 2016-2018 accounting for 69.6% of all RTAs which is much higher than what we found in that age group. In contrast the study of Toro et al found that victims belonged to an older age group and died of trauma difficulties after hospitalization.

As per the data given by WHO, afternoon and evening witnessed the maximum fatalities. We reported more two-wheeler accidents in evening after 6 PM, whereas maximum incidence of four-wheeler accidents and pedestrian injuries were seen in the afternoon hours with a peak in the summer.

Durkin et al. reported that peak incidence of pedestrian and motorcyclist injuries occurred during the summer months. In studies conducted in Mangalore most of the accidents took place during the afternoon and evening hours. Singh D et al reported more fatalities between 12 to 4 PM but in the months of September to October. Pathak et al observed most cases occurred in the monsoons and between 6 and 10 PM. Kumar S et al found that January and evening was the time of the day with maximum accidents.

In 2018 not wearing helmets caused 28.8% of total road traffic deaths. In our study the mortality rates were more in non-helmet users (49.2) than in helmet users (4%) in the age group of 21-30 years but in the age group between 31-50 years helmet users (40%) had more fatalities than non-users (19.2%) probably because of use of sub standardised devices and improper fastening of chin straps. Most commonly found intracranial haemorrhage was subdural haemorrhage and subarachnoid haemorrhage while extradural haemorrhage was observed in the least which is consistent with the findings by other researchers. Use of standardised head protective devices decreased the mortality as suggested by Cawich SO et al and Nzegwu et al in their studies. Aowen et al in their six-year study in China found that 75.2% suffered both skull fracture and intracranial injury while 24.1% have an intracranial injury with no skull fractures and that helmets improved the chances of survival in head injuries. Tripathi et al found that helmeted users suffered a smaller number of head injuries compared to non-users. Sola Kim et al observed preventive aspects of helmets much more in low impact crashes.

Conclusion

This study again emphasised the fact that fatal head injuries were common among two wheelers motorcyclists due to lack of standardised protective head gear. Responsible attitude of road users will avert a majority of road traffic accidents. This observational data on fatalities might be helpful in a real time causative analysis of road traffic accidents essential in the design and implementation of road safety programmes.

Limitations: This study took into account only those cases received at our centre and may not represent the entire region.

Declaration of conflicting interests: The authors declare that there is no conflict of interest.

Funding: None.

Ethical approval: Necessary ethical approval was obtained.

References
2. Government of India: Ministry of road transport


Positive Versus Negative Framing of Information

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Abstract

Background/Objectives: The message is being used as a mode of intervention leading to preventive health behaviors and can lead to modifications in knowledge, attitudes and behaviors in a large proportion of health behaviors. The purpose of this study is to identify the effective and persuasive message types among positive and negative message types in information on specific health behaviors, to evaluate the effects by systematically classifying and analyzing related studies and to lead evidence-based practices.

Method/Statistical Analysis: In this study, meta-analysis was conducted to evaluate the trends and reporting levels of the study in order to evaluate and systematically classify the effects of message types in information on health behavior. Only clinical studies with randomization comparing the effects of positive and negative message framing with respect to health behavior were selected. In addition, a case where the interventions were compared by dividing them into two groups was selected.

Improvements/Applications: Among the final selected papers, 7 papers were included in the included studies through methodological quality evaluation. Comparison of the positive and negative message interventions is related to health behaviors related to breast cancer (SMD -0.04 (95% CI -1.57 to 1.50), health behaviors related to vaccination (MMR, HPV)(SMD 0.20 (95% CI -0.69 to 1.08), cancer screening, vaccination, physical activity and all health activities related to Type 2 diabetes screening (SMD -0.21 (95% CI -0.89 to 0.47). All of these were not statistically significant. In order to confirm the change in health behavior according to message framing, a study considering the same target population and outcome indicators is necessary.

Keywords: Message Framing, Positive Message, Negative Message, Health Behavior.

Introduction

The message is being used as a mode of intervention leading to preventive health behaviors and can lead to modifications in knowledge, attitudes and behaviors in a large proportion of health behaviors. In order to enhance the persuasive effect of messages, various types of fields have been studied to see if there is a difference in the effect of persuading a subject depending on the type of message. Message types are categorized according to message framing, message appeal, etc. Among them, message framing refers to a series of processes that select and make certain elements of a message stand out and recommendations provide prisoners to achieve the same purpose. It refers to the method of manipulating the messages of profit framing that highlights the potential benefits and benefits of choosing and loss framing that highlights the negative consequences of not choosing[1].

In general, decision making of health behaviors varies greatly depending on how the problem is presented. In this case, the method of expressing the problem is called a ‘frame’ in judgment and judgment or selection changes as the frame changes. It is said to be a ‘framing effect’. However, since there are differences in approaching framing research on health behavior, there is a need to establish evidence-based practice by checking the message framing effect through systematic consideration. In general, in the case of messages that

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motivate health-related behaviors, negative messages are perceived more effectively than positive messages[2,3].

Indeed, in various studies, the persuasive effect of loss framing was more pronounced. In Meyerowitz & Chaiken[4], the breast cancer self-diagnosis recommendation showed that the loss framing showed a higher self-diagnosis will. While prisoners did not adopt breast cancer self-diagnosis recommendations in profit framing because of their tendency to evade risk, loss framing strengthened their risk-seeking tendencies, making it more favorable to adopt recommendations. This is the result of prisoners handling self-discovery information that takes risks through actions that may find lesions. In the HIV recommendation study [5]. Loss framing was highly effective among recommendations for health-promoting behaviors to detect lesions.

On the other hand, according to the Expectancy-Consistency Hyposis proposed by Smith & Petty [6], in the condition that the audience expects negative information, positive messages have more attention and have more influence on attitude formation.

As discussed above, there are differences in the effects of positive and negative message types in information on specific health behaviors and there is a need to identify effective and persuasive message types. This is to lead evidence-based practice by systematically classifying and evaluating research related to message framing.

Method

Criteria for considering studies for this review

Types of studies: Randomized controlled trials(RCT), controlled before and after studies

Types of participants: The subjects were not limited and all students, patients and the general public were included.

Types of interventions: We looked at studies comparing the effects of positive and negative messages in information to lead the same health behavior. Exclusion factors were excluded when the two framings could not be compared with counseling and single intervention therapy, not the type of message.

Types of outcome measures: There were no restrictions such as changes in actual behavior, behavioral intentions and attitudes and perceptions.

Search method for identification of studies:

Electronic searches: As for the data search, the search engines of Ovid MEDLINE(1966 to 2018), EMBASE(1980 to 2018), CINAL(1982 to 2018), PsyINFO(1887 to 2018) and Cochrane Central Register of Controlled trials(Issue 4, 2018) were used for overseas data search and KAMJE, Koreamed, KISS and related journals were used for domestic data search. We also looked at the list of references related to the subject in this document.

Searching other resources: Among the searched papers, a method of retrieving relevant papers among the papers that met the selection criteria and the references of the selected research was used.

Data collection and analysis:

Selection of studies: In this study, published randomized controlled trials with a high level of evidence and minimal bias were selected as the target literature for systematic review and meta-analysis. As a result variable, there was no restriction and papers that were compared by mediating positive and negative messages on the same health behavior were selected.

In order to evaluate the suitability of the selection criteria among the collected documents, the title and abstract were primarily reviewed. After extracting the data, the research method, participants, intervention, evaluation results and research results were selected and data related to the subject were selected.

Data extraction and management: Documents that did not compare the effects of message framing in the same health behavior or that did not provide the mean value, standard deviation and sample number of efficacy evaluations necessary for meta-analysis were excluded.

Assessment of risk of bias in included studies: In order to prevent the risk of prejudice, blind extraction was performed prior to comparison between evaluators with the help of one doctor and there was no part of disagreement or disagreement during the comparison. Methodological quality assessment method Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach was used and the data selected for the analysis were selected based on the following method.

- Randomization.
• Allocation concealment
• Objectivity and directness of outcomes:

Assessment of heterogeneity: The $I^2$ test was used to confirm the heterogeneity of the compared paper and the degree of heterogeneity is as follows.

- < 25% : low
- 25%~ 75% : moderate
- 75% < : high

Data synthesis: Each paper has random effects models and SMD was used.

- < 0.40 represents a small effect size
- 0.40 to 0.70 represents a moderate effect size
- > 0.70 represents a large effect size

Data Analysis: $I^2$ test is used to check the heterogeneity of the paper and each paper is analyzed using random effects models and SMD.

Result and Discussion

Description of studies

Results of the search: A total of 233 papers were searched through the search engine and among them, 40 related papers were selected by checking the title and outline. For the selected papers, 16 papers were selected after reading the full text. Looking at the classified aspects of the selected papers through quality evaluation of the papers, 2 breast cancer screenings, 1 colon cancer screening, 1 diabetes screening and vaccination, 2 breast cancer screenings, 1 colon cancer screening, 1 diabetes screening and vaccination, 7 in total. The selected paper was a study conducted in the United States and the United Kingdom and the number of subjects was usually 100 to 300 and the results of the study reported the attitudes, perceptions and behavioral intentions of health behavior.

Included studies: All 7 papers were conducted on health consumers and the response rate was high in Part 2 (> 50%) and low in Part 1 (≤ 50%). Response rates were not reported in the three studies. Seven papers were compared in three ways according to the health behaviors associated with the message type.

- Comparison of all 7 health behaviors
- Comparison of 3 cancer screening health behaviors
- Comparison of two vaccination health behaviors

As a result of the study, papers using standardized mean difference (SMD) were selected and papers used as odds ratio were not included.

Excluded studies: Nine papers were excluded and the reasons are as follows. SMD to compare the effect of the results was not used (n = 6) and the total subjects were shown, but the number of subjects according to positive and negative message types was not compared to compare the two interventions.

Risk of bias in included studies: Of the 7 papers, randomized 2 (30%), 1 randomized (15%) and 4 (55%) unclear, randomized and objective in all 7 papers Result indicators were used.

Effects of interventions

[Positive versus negative framing]

Comparison 1. All health behaviors: The changes in awareness, attitudes and intentions according to message framing were examined for all health behaviors (physical activity, cancer screening, vaccination, diabetes screening). The combined estimates were statistically insignificant with SMD -0.22 (95% CI -0.89 to 0.47) and among the combined papers, Bigman (2010) and Nicholson (2008) were qualitatively superior papers, respectively, with SMD 0.64 (95% CI 0.33 to 0.96) and SMD 0.38 (95% CI 0.15 to 0.61) showed that the negative message type was statistically significant in leading health behavior changes than the positive message type. The heterogeneity of the study combined with ($I^2 = 98\%$) was found to be very severe. Figures 1 and 2 show forest plots and funnel plots for all health behaviors.
Comparison 2. Cancer screening: Among the seven selected papers, we examined changes in perception and intention according to message framing in relation to cancer screening behavior. Combined estimates were statistically insignificant with SMD -0.044 (95% CI -1.57 to 1.50) and among the combined papers, Gallagher et al. [8] was positive with SMD -1.26 (95% CI -1.49 to 12.04). The message showed statistically significant perceived sensitivity to examination rather than negative message. On the contrary, Nicholson (2008) showed that SMD 1.15 (95% CI 0.91 to 1.39) showed that the negative message type showed a statistically significant change in cancer screening intention rather than the positive message type. The heterogeneity of the study combined with (I² = 99%) was found to be very severe. Figures 3 and 4 show forest plots and funnel plots for cancer screening.

Comparison 3. Vaccination: Among the seven selected papers, changes in perception and intention according to message framing were examined in relation to vaccination (MMR, cervical cancer vaccine) behavior.
The combined estimates were statistically insignificant with SMD 0.20 (95% CI -0.69-1.08) and among the combined papers, Bigman et al.[7] was a qualitatively superior paper with SMD 0.64 (95% CI 0.33 to 0.96). Negative message type was statistically more significant in vaccination perception change than positive message type. The heterogeneity of the study combined with (I² = 93%) was found to be very severe. Figures 5 and 6 show forest plots and funnel plots for vaccination.

![Figure 3. Forest plot of comparison 2: Cancer screening](image)

![Figure 4. Funnel plot of comparison 2: Cancer screening](image)

![Figure 5. Forest plot of comparison 3: Vaccination](image)
Discussion

In order to prepare evidence-based practice, we looked into effective message framing in the decision process of health behavior. However, through the selected paper, the difference between the positive message and the negative message effect was not statistically significant. This does not take into account different population and outcome measurement method, variable definitions, tracking periods and estimates. It is confirmed that the quality of the data is low because it was induced. Nevertheless, among the combined papers, it was possible to identify the types of messages that statistically significantly influenced health behavior. In Bigman et al. [7], a negative message type was found to be more effective than a positive message type in the perceived benefit associated with uterine cancer vaccination of college students and the change in adult colon cancer screening intentions in Nicholson et al. [8]. In addition, in the perceived sensitivity associated with breast cancer screening in adult women, positive messages were found to be more effective than negative message types.

Of the 7 selected papers, only 2 (30%) of studies with cover-ups were assigned and 1 (15%) with no cover-ups, but 4 studies (55%) appeared to be unclear. As the allocation concealment was not clearly seen in more than 50% of the papers, it would have been a risk factor for bias in analyzing and synthesizing data.

The quality of the selected papers was evaluated based on the GRADE approach and randomized and objective result indicators were used for all 7 papers. The combined paper evaluated the estimated values with SMD and CI and the I2 test was used as an important evaluation index to give the meaning of SMD. The papers used for combining were highly heterogeneous and there was no difference between positive and negative messages in the estimated values.

All of the studies selected in this paper were excluded from the selection because the domestic papers did not select randomization and concealment of sampling.

Although studies with theoretical backgrounds such as message framing are being conducted both domestically and abroad, differences between domestic
and foreign studies have been found. In Korea, studies have been active in the field of health and crisis behavior, which focuses on eating habits, smoking, exercise, skin health, drugs and decision making. In foreign studies, various disease areas such as cancer prevention and screening, influenza and glaucoma and physical activity was working on framing.

The estimates from the selected papers were not statistically significant. Three studies in the sub-region showed statistically significant differences according to message framing. Each is as follows.

In the Gallagher et al. [9], study, the positive message type was more effective than the negative message type in breast cancer screening intentions for adult women, which is contrary to those of Block & Punam [2] and Meyerowitz & Chaiken [4] showed.

In the study of Nicholson et al. [8], in the intention to screen for colon cancer in adults, the negative message type was statistically significant in leading to changes in health behaviors rather than the positive message type and the Bigman et al. [7], study targeted female university students. In the intention to inoculate the cervical cancer vaccine, the negative message type was statistically significant in leading the change in health behavior than the positive message type.

The limitation in this study is that the previous studies have not been sufficiently progressed, so there is a problem that it cannot be analyzed in consideration of the same population and the same outcome variables, so it is not possible to accurately predict the prediction of the framing effect in the prevention and examination of diseases. In addition, even in the same framing type, differences may occur depending on the type of educational materials (document, audiovisual, etc.) and the method of education (persuasive, explanatory, etc.) and depending on the individual characteristics of the recipient, in addition to the message involvement and recommendation characteristics Framing effects can vary, so it is necessary to measure individual perception and characteristics.

In addition, this study has difficulty in developing discussions because it did not look at the similarities or differences with research trends in other fields that can be compared while conducting research on the framing of health-related messages.

Conclusion

The effect of message framing on the macroscopic part that affects population health as well as on health risk behaviors and disease-related choices should be studied. If we can grasp the effect of message framing on health behavior through these studies, we will be able to prepare an effective and useful theoretical framework for constructing the message of the health campaign, which will contribute to establishing evidence-based practice.

Ethical Clearance: IRB 1041223-202003-HR-02

Source of Funding: Self

Conflict of Interest: Nil

References


A Comparison of Symptoms, Functional Status and Quality of Life by the Survivor Stages of Pancreatic Cancer Patients

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Abstract

Background/Objectives: The purpose of this study was to identify the difference of symptoms, functional status and quality of life (QOL) according to the survival stage of pancreatic cancer patients.

Method/Statistical analysis: Descriptive, cross-sectional design. A sample of 139 patients was surveyed. The participants were as patients who were diagnosed with pancreatic cancer in Republic of Korea. The data collected was analyzed with descriptive statistics.

Findings: Nausea and vomiting symptoms were significantly higher in acute survival stage than in extended survival stage and insomnia and diarrhea were significantly higher in extended survival stage than in acute survival stage functional status and QOL were significantly higher in extended survival stage than in acute survival stage.

Improvements/Applications: The differences in symptoms, functional status and QOL by the survival stage of pancreatic cancer patients were grasped and the empirical evidence was given for performing differentiated nursing interventions by each survival stage.

Keywords: Pancreatic cancer. Survival stages, Symptoms, Functional status, Quality of life.

Introduction

Pancreatic cancer is one of the major diseases that rank fifth in cancer mortality rates in Republic of Korea, the 5-year relative survival rate of pancreatic cancer is 11.1%, which can be found as very low compared to the overall cancer survival rate of 70.6%[1]. Pancreatic cancer which is a low survival rate, nursing that prioritizes the quality of life (QOL) is required not from the last day to a couple of weeks, but from the day of diagnosis[2]. Most of the patients with pancreatic cancer would be threatened their QOL by unfavorable prognosis[3,4,5].

QOL is a subjective well-being condition that individuals feel about their lives and it is raising its head as an evaluation index of the treatment of cancer[6]. To maintain the highest level of well-being of the subject which is the main purpose of nursing and help, identify the factors affecting the QOL of pancreatic cancer patients and develop ways to mediate them is cancer patients experience a variety of symptoms and changes in functional status as they undergo physical, psychological and cognitive changes in the treatment and progress of the disease, among them, the symptoms play an important role in functional conditions and QOL[7]. The functional status of patients diagnosed with pancreatic cancer is reported to be very low compared to other cancer diseases[8], so efforts should be preceded to verify the patient’s functional status and to understand the nursing needs of those diagnosed clearly.

Mullen[9] classified the cancer survival stage into three stages based on changes in cancer condition and treatment process after cancer was diagnosed and argued that the required intervention method for each stage was different. These survival stages are a complex process
that occurs continuously and dynamically in the begins with the diagnosis of the cancer[10]. Therefore, assessing and interpreting the symptoms, functional status and QOL of survivors at each stage and differentiated arbitration by each survival stage should be applied.

The purpose of this study was to identify the difference of symptoms, functional status and QOL according to the survival stage of pancreatic cancer patients and to use it as evidence for developing differentiated nursing intervention according to the characteristics of survival stage.

Method

Research Design: This study is a descriptive-cross sectional study.

Research Subjects: The participants were as patients who were diagnosed with pancreatic cancer and visiting outpatient departments of one general hospital in Republic of Korea for treatment and further care. The inclusion criteria for this study were (a) adults >20 years old, (b) diagnosed patient with pancreatic cancer and (c) patients capable of understanding the contents of the questionnaire and responding directly to the questionnaire. The exclusion criteria for this study were (a) patients with psychiatric anamnesis or those receiving medication, (b) non-protopathic pancreatic cancer and (c) serious comorbid diseases requiring treatment other than pancreatic cancer.

The sample size of this study was calculated as a total of 126 people by using the G*power program when it set as t-test significance level (α)=0.05, effect size=0.5 and verification power (1- β) = 80[11].

Among data from 140 people which considered the dropout rate of 10%. 139 people were used as final analysis data except for one questionnaire which was insufficiently responded. As a result of the classification by survival stage, It was 100 people in the acute survival stage, 31 in the extended survival stage and 8 in the permanent survival stage that, the number of subjects in the permanent survival stage was not enough so the survival stage was reclassified to 2 stages by including the permanent survival stage in the extended survival stage based on previous research[11]. Finally, the patients were divided into 100 people in acute survival stages that less than 2 years after diagnosis of pancreatic cancer and 39 people in extended survival stages that more than 2 years after diagnosis of pancreatic cancer.

Measurement:

Symptoms: In this study used the sub territory of the QOL related to symptoms among the Korean version tools of EORTC QLQ-C30 (version 3). It is composed of 4 point scale and calculated from 0 to 100 points as perfect score according to the scoring instructions of the tool. Lower scores indicate better symptoms. At the time of development, it was Cronbach’s α=85 and in this study, it was Cronbach’s α=.87.

Functional status: In this study, using the sub territory of the QOL related functional status among the Korean version tools of EORTC QLQ-C30 (version 3). There are totals of 15 items, including five items of physical function, two items of role function, two items of cognitive function, two items of emotional function, two items of social function. It is composed of 4 point scale and calculated from 0 to 100 points as perfect score according to the scoring instructions of the tool. Higher scores indicate better functional status. At the time of development, it was Cronbach’s α=90 and in this study, it was Cronbach’s α=.91.

Quality of life: In this study used the Overall QOL among the Korean version tools of EORTC QLQ-C30 (version 3). There are totals of 2 items including 1 item of general health condition and 1 item of QOL and It is 7 point scale and calculated from 0 to 100 points as perfect score according to the scoring instructions of the tool, which means that the higher the score, the better the QOL. At the time of development, it was Cronbach’s α=84 and in this study, it was Cronbach’s α=.86.

Data Collection: The data collection of the study was conducted from June 15, 2018 to August 30. The list of patients visiting the outpatient department of a general hospital. The survey was conducted by including those who voluntarily agreed to participate in the study after the researcher explained by orally and in writing of the purpose and procedures of the study to the selected person, then conducted through the way of the subject directly filling out the questionnaire.

Data Analysis: The collected data were analyzed using the SPSS/WIN 25.0 program as follows. The differences in general characteristics, disease-related characteristics, symptoms, functional status and QOL were analyzed with χ2 test and t-test. Substantial missing data, one questionnaire were excluded from analysis. p-values <0.05 were considered significant.
Result and Discussion

The differences in general characteristics and disease-related characteristics: The number of people in acute survival stages was the largest at 100 (71.9%) and the number of people in extended survival stages was 39 (28.1%). As a general characteristic, the largest number of the gender was men as 100 (71.9%) and the largest number of age was between 56 and 65 as 59 (42.4%). In disease-related characteristics, the largest number of pancreatic cancer locations was in the head of the pancreatic as 89 people (64.0%) and metastasized cases as 75 people (54.7%). As for the treatment method, It was shown that 104 people (74.8%) took surgical treatment and 76 people (54.7%) took chemotherapy and 123 people (88.5%) did not take radiation therapy. There was no significant difference between the acute survival stage and the extended survival stage according to the analysis result of the difference in general characteristics and disease-related characteristics according to the survival stage of pancreatic cancer patients.

Differences in symptoms, functional status and QOL: [Table 1] shows the differences in symptoms, functional status and QOL in pancreatic cancer patients. Nausea and vomiting were significantly higher in acute survival stage as 56.38±13.15 than in extended survival stage as 45.82±10.91 (t=-4.45, \(p<.001\)) and insomnia was significantly higher in extended survival stage as 52.59±11.72 than in acute survival stage as 42.59±11.72 (t=-4.70, \(p<.001\)) and the diarrhea was significantly higher in the extended survival stage as 55.51±7.40 than the acute survival stage 50.60±4.87 (t=-4.70, \(p<.001\)). As a result of analyzing the difference of functional status by survival stage, the physical function was significantly higher in extended survival stage as 57.69±8.25 than in acute survival stage of 53.47±9.99 (t=-2.55, \(p=.013\)), the role function was also in extended survival stage as 48.8±13.47 than in acute survival stage of 42.79±10.62 (t=-2.50, \(p=.015\)) and the cognitive function was significantly higher in extended survival stage as 49.01±13.27 than in acute survival stage as 40.46±0.116 (t=-3.63, \(p=.001\)). As a result of analyzing the difference in the QOL in patients with pancreatic cancer showed that the extended survival stage was 55.40±6.35, significantly higher than the acute survival stage of 51.54±4.67 (t=-3.45, \(p=.001\)).

Discussion

This study was conducted to identify symptoms, functional status and differences in QOL according to the survival stages of pancreatic cancer patients.

In this study, as a result of looking into the difference of symptoms according to the survival stage, was found that in the acute survival stage was more complain of nausea and vomiting symptoms than in the extended survival stage and in the extended survival stage more severe insomnia and diarrhea symptoms than in the acute survival stage. Result of this was similar to a study that reported in the Cohort study of 564 pancreatic cancer survivors that pancreatic cancer survivors complained of symptoms such as nausea, vomiting, insomnia, fatigue, pain and loss of appetite\(^{12}\). In particular, the symptoms of nausea and vomiting are accompanied by symptoms of appetite loss and based on studies that report that 75% of patients with pancreatic cancer complain of appetite loss\(^{13}\), it is necessary to evaluate the status of food intake and nutrition absorption and to make efforts for continuous management in order to confirm the nutritional status as well as the intervention for relieving symptoms according to the survival stage of pancreatic cancer patients. Especially in the case of undernourished cancer patients, symptoms such as electrolyte imbalance, infection and fatigue were accompanied, consequentially a negative impact on the survival rate and QOL of cancer patients appeared\(^{12}\). Hence, evaluate the nutritional status of the individual and to organize a nutrition program to so that the necessary nutrients can be properly consumed in order to control their symptoms and improve nutrition intake and efforts that continuously watch and support the dietary intake and nutritional state are required.

Meanwhile, the symptoms of cancer patients are multiple symptoms at the same time, especially for pancreatic cancer patients, there are 5 ~ 10 symptoms exist at the same time and it appeared that they are interrelated\(^{14}\). As such, it is necessary to verify whether there is a difference in the survival stage of pancreatic cancer patients with the symptom cluster in which exists two or more symptoms at the same time is different in the survival stage of pancreatic cancer patient.

The functional status according to the survival stage was significantly higher in physical function, role function and cognitive function in the extended survival stage than in the acute survival stage. These results can be predicted as the patient would be faced anxiety and shocked by sudden diagnosis in the early stages of diagnosis, but with the passage of time, they adapt and handle disease and treatment and become better functional status.
Table 1. Differences in symptoms, functional status and QOL in pancreatic cancer patients

<table>
<thead>
<tr>
<th>Variables</th>
<th>Categories</th>
<th>M±SD</th>
<th>ASS(^1) (n=100) M±SD</th>
<th>ESS(^2) (n=39) M±SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms</td>
<td>Fatigue</td>
<td>55.29±11.23</td>
<td>54.17±11.19</td>
<td>58.16±10.11</td>
<td>-1.90</td>
<td>.059</td>
</tr>
<tr>
<td></td>
<td>Nausea/vomiting</td>
<td>48.78±12.48</td>
<td>56.38±13.15</td>
<td>45.82±10.91</td>
<td>-4.45</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>Pain</td>
<td>49.26±11.77</td>
<td>54.53±11.67</td>
<td>47.21±10.92</td>
<td>-4.14</td>
<td>.061</td>
</tr>
<tr>
<td></td>
<td>Dyspnea</td>
<td>46.08±10.15</td>
<td>43.71±10.92</td>
<td>46.94±7.94</td>
<td>-5.5</td>
<td>.586</td>
</tr>
<tr>
<td></td>
<td>Insomnia</td>
<td>45.58±10.63</td>
<td>42.85±8.83</td>
<td>52.59±11.72</td>
<td>-4.70</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>Appetite loss</td>
<td>45.34±10.11</td>
<td>44.46±10.16</td>
<td>47.15±8.31</td>
<td>-4.00</td>
<td>.052</td>
</tr>
<tr>
<td></td>
<td>Constipation</td>
<td>59.54±6.49</td>
<td>59.87±7.22</td>
<td>58.43±3.92</td>
<td>1.61</td>
<td>.109</td>
</tr>
<tr>
<td></td>
<td>Diarrhea</td>
<td>51.98±6.09</td>
<td>50.60±4.87</td>
<td>55.51±7.40</td>
<td>-3.83</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Total symptom score</td>
<td></td>
<td>50.21±5.80</td>
<td>48.85±5.10</td>
<td>53.69±6.10</td>
<td>-4.39</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Functional status</td>
<td>Physical</td>
<td>54.65±9.70</td>
<td>53.47±9.99</td>
<td>57.69±8.25</td>
<td>-2.55</td>
<td>.013</td>
</tr>
<tr>
<td></td>
<td>Role</td>
<td>44.48±11.76</td>
<td>42.79±10.62</td>
<td>48.8±13.47</td>
<td>-2.50</td>
<td>.015</td>
</tr>
<tr>
<td></td>
<td>Cognitive</td>
<td>42.86±11.72</td>
<td>40.46±10.16</td>
<td>49.01±13.27</td>
<td>-3.63</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>Emotion</td>
<td>60.01±6.92</td>
<td>59.97±7.22</td>
<td>60.12±6.17</td>
<td>-0.11</td>
<td>.911</td>
</tr>
<tr>
<td></td>
<td>Social</td>
<td>59.77±9.84</td>
<td>60.52±9.18</td>
<td>57.83±11.25</td>
<td>1.45</td>
<td>.148</td>
</tr>
<tr>
<td>Total functional status score</td>
<td></td>
<td>51.24±6.61</td>
<td>51.44±4.65</td>
<td>50.72±4.51</td>
<td>.843</td>
<td>.402</td>
</tr>
<tr>
<td>Quality of life</td>
<td></td>
<td>52.63±6.45</td>
<td>51.54±4.67</td>
<td>55.40±6.35</td>
<td>-3.45</td>
<td>.001</td>
</tr>
</tbody>
</table>

\(^1\)Acute survival stage; \(^2\)Extended survival stage

Meanwhile, in the study of Carrato et al.[2] reported that patients who took pancreatic cancer resection showed the longest average survival rate in the 11 ~ 25.7 months range and that patients who took chemotherapy, radiation therapy, palliative surgery or exploratory laparotomy had an average survival period of between 2 ~ 8.1 months and 1.1 months for patients who took no surgery or active treatment. Compared the prognosis and survival rates of these pancreatic cancers with the results of this study, it is predicted that the overall functional status was measured as low due to the poor prognosis in the acute survival stage and numerous survivors who are focused on treatment.

This study confirmed the contents what Mullen[9] argued that the intervention method required by the cancer survival stage was different. In addition, the differences in symptoms, functional status and QOL by the survival stage of pancreatic cancer patients were grasped and the theoretical basis was given for performing differentiated nursing interventions by each survival stage.

Conclusion

This study aims to identify the differences in symptoms, functional status and QOL depending on the survival stage of pancreatic cancer patients and to utilize them as basic data for the development of differentiated nursing interventions program considering the characteristics of each survival stage.

The study result has shown that in the symptoms of pancreatic cancer patients by survival stage, symptoms of nausea and vomiting in patients with pancreatic cancer are significantly higher in the acute survival stage than in the extended survival stage and that insomnia and diarrhea in the extended survival stage are significantly higher than in the acute survival stage. Functional status (physical function, role function and cognitive function) and QOL were significantly higher in the extended survival stage than in the acute survival stage. Based on the above results of this study, the following suggestions are proposed. As a result of this study, although there were differences in symptoms, functional status and QOL according to the survival stage, it is difficult to
generalize the study results because the clinical stage, metastasis or not and treatment conditions of pancreatic cancer survivors who configured for each survival stage, are not identical. Therefore, further studies that collect and compare the same subjects need to be conducted.

**Ethical Clearance:** IRB 2018-06-02

**Conflict of Interest:** Nil

**Source of Funding:** Self

**References**


Caring Behavior of Health Professionals: Its Implication to Clinical Practice

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Abstract
Health professionals’ behavior play a vital role in the care patient for it has been assumed that effective behavior promotes a caring relationship leading to an outcome that is therapeutic to both. The purpose of this study was to ascertain the caring behavior demonstrated by the health professionals based on the perspectives of allied health students and its propositions to clinical practice though patients’ point of view. Sequential Explanatory Strategy of the mixed method research design was employed where survey and conduct of key informant interview were the strategies employed in the collection of data. Weighted means were used to represent how caring behavior was demonstrated by the health professionals. Independent T-test was utilized to validate the difference of caring behavior demonstrated while thematic data analysis for the data collected during interviews. It was found that caring behaviors of health professionals were demonstrated the same and has no difference. Indeed, caring behavior of academicians is an essential element in developing a learner’s personality as future health professional. It is a must to uphold and disseminate the critical aspects of the caring behavior among learners in developing them as future health professional practitioners.

Keywords: Health Professionals, Caring behavior, Clinical practice.

Introduction
Caring emerged as a significant aspect has to possess in response to the environment. It greatly influences how an individual be nurtured and socialize. In education, caring is an approach that is based on reciprocal relationship between the teacher and students on ethical and human principles where caring based interaction of teachers and students’ action and feeling are equally considered.\footnote{1} It is widely accepted that good student-teacher relationship is important in increasing students’ sense of attachment to school that facilitates academic success. The objective patterns in learning to in planning and development of learning situations applies evidences and instances in educational processes that will help students to have meaningful learning experiences and introduce patterns of caring behavior to students.\footnote{2} At this point, caring as a behavior is essential in promoting the welfare of students. It is a teaching-learning approach that is formed based on constant teacher-student interactions at which, the nature of this educational strategy focuses on caring.\footnote{1} Moreover, previous research finding provides additional insight that teacher’s behavior as desired by students contributes to their educational success.\footnote{3}

Studies in higher education show the significant of a learning atmosphere that is caring, confident and welcoming are favorable to academic growth for all students.\footnote{4} Moreover, students’ achievement of self-esteem and peace reduced anxiety, developing self-esteem and increased the sense of empowerment in students are the outcomes of inducing caring concept in educational system.\footnote{5} Further, instructors’ caring behaviors influenced nursing students’ caring behaviors positively\footnote{6} and it is most important to show caring as a behavior for it can boost nursing students’ interests in learning caring behaviors by incorporating diverse teaching strategies to enhance the effectiveness of caring behaviors.\footnote{7}

Moreover, caring relation is an appropriate framework for guiding and creating ethical education\footnote{8} though some health care professionals are comfortable and competent users of technology, they must also preserve a focus on professional-patient relationship.
to achieve quality health care. A relationship that involve reflection on practice to increase recognition and demonstration of caring behaviors because it was concluded that, caring behavior is essential in clinical practice. One thing, a study showed that the concept of caring has been applied in designing curriculum based on the concept of caring instrument development and as a criterion to measure caring behavior.

On the other hand, the realization of this craft derived from a belief that effective caring promotes health and a higher level of wellness. It is considered a universal need and an important component in the delivery of health care. However, a study revealed no congruence on the perceptions of nurses and patients when it comes to demonstration of caring behaviors. This bring additional interest to discover how mentors’ caring behavior affect learners as future practitioner.

**Method**

Sequential Explanatory Strategy of the mixed method research design was utilized. This method composed of two phases of data gathering that is a combination of quantitative and qualitative strategy. Clustered-purposive-convenience sampling was used for all participants are known and was organized into groups where each group has own part in the accomplishment of this endeavor. It is purposive because the selection of participants was criterion based and convenience for it relied on available allied health students enrolled in Bachelor of Science in Nursing (BSN), Bachelor of Science in Physical Therapy (BSPT), Bachelor of Science in Medical Technology (BSMT) and Bachelor of Science in Respiratory Therapy (BSRT) who were currently enrolled during data gathering, and the patients confined in a healthcare facility during the scheduled data collection being cared by Registered Physical Therapist (RPT), Registered Nurse (RN), Registered Medical Technologist (RMT) and Registered Radiologic Technologist (RRT). Tools used were self-made Caring Behavior Instrument for students (CBIS) and Caring Behavior Assessment (CBA) tool based from Watson’s ten Carative Factors. CBA tool was translated to “Ilocano” for it is the common dialect spoken by Cordilleran aside from other local dialects they are using. Both instruments were pretested to determine its reliability making use of Kuder-Richardson 20 (KR20) coefficient and were declared valid for the coefficients of reliability were 0.99 and 0.98 respectively with a descriptive equivalent of “very reliable”. Meanwhile, Semi-structured interview guide was also employed to substantiate the findings.

It is a mere fact that statistics is dealing with the collection, analysis, interpretation, presentation and organization of data. Average weighted mean was used to interpret and analyze the surveyed data and Independent sample T-Test was used to validate differences on caring behavior. Use of words during interview were the basis of analysis where reasoning flows from the words provided by the participants toward themes that are patterned from the data or ideas that were repeated by more than one participant. This reasoning process and inductive thinking guides the organizing, reducing and clustering of data at which once themes are identified, the researcher uses deductive reasoning when considering the fit of data to the themes.

**Results and Discussions**

In learning or in practice, caring behavior of mentors or practitioners is an attribute that is essential in dealing with the environment. Table 1 presented how health professionals as mentors demonstrated their caring behavior that is imperative to learner’s personality, academic and non-academic achievement for it influences them how to get into it.

<table>
<thead>
<tr>
<th>Caring Behavior</th>
<th>Academic Program</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RN</td>
<td>RMT</td>
</tr>
<tr>
<td>Presence</td>
<td>Mean</td>
<td>4.16</td>
</tr>
<tr>
<td>DI</td>
<td>FD</td>
<td>FD</td>
</tr>
<tr>
<td>Guidance</td>
<td>Mean</td>
<td>3.84</td>
</tr>
<tr>
<td>DI</td>
<td>FD</td>
<td>CD</td>
</tr>
</tbody>
</table>
There were seven identified caring behaviors of mentors extended to learners. These are presence, guidance, competence, psychosocial support, commitment, confidence and conscience which was generally perceived as frequently demonstrated. Learners perceived that mentors were committed greatly in teaching with competence and confidence. Their moral as a mentor always touches their conscience leading them to properly guide and sparingly support their learners’ psychosocial wellbeing. However, there presence is minimal due to their complex responsibilities as educator. This result corroborates with the level of nursing instructors’ caring behavior during teaching students was medium to high with the mean and standard deviation of 4.65 which means that clinical instructors deeply cared for their students. However, looking into consideration the weighted means of the findings, commitment of mentors was nearly to be constantly demonstrated. Studies in higher education show the significant of a learning atmosphere that is caring, confident and welcoming and favorable to academic growth for all students. The pedagogic context of caring involved developing rapport and going out of one’s way to provide learning experiences geared toward students’ attributes while in caring-based interactions, the actions and feelings of instructors and students are considered equally. These literatures proved commitments of the mentors. Moreover, the findings itself reflected that each academic program had their own focus of learning needs and observations as to caring capabilities of their mentors. This can be a good indicator in deciding what attitude and strategy or method in teaching or educating learners to be inculcated in mentoring.

On the other hand, Table 2 revealed how health professionals as clinician demonstrated their caring behaviors to their patients.

Table 2: Caring behavior of allied health professionals as perceived by patients in a healthcare facility

<table>
<thead>
<tr>
<th>Caring Behavior</th>
<th>Academic Program</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RN</td>
<td>RMT</td>
</tr>
<tr>
<td>Competence</td>
<td>Mean</td>
<td>4.21</td>
</tr>
<tr>
<td></td>
<td>DI</td>
<td>CD</td>
</tr>
<tr>
<td>Psychosocial support</td>
<td>Mean</td>
<td>3.91</td>
</tr>
<tr>
<td></td>
<td>DI</td>
<td>FD</td>
</tr>
<tr>
<td>Commitment</td>
<td>Mean</td>
<td>4.04</td>
</tr>
<tr>
<td></td>
<td>DI</td>
<td>FD</td>
</tr>
<tr>
<td>Confidence</td>
<td>Mean</td>
<td>4.21</td>
</tr>
<tr>
<td></td>
<td>DI</td>
<td>CD</td>
</tr>
<tr>
<td>Conscience</td>
<td>Mean</td>
<td>3.91</td>
</tr>
<tr>
<td></td>
<td>DI</td>
<td>FD</td>
</tr>
<tr>
<td>Overall</td>
<td>Mean</td>
<td>4.04</td>
</tr>
<tr>
<td></td>
<td>DI</td>
<td>FD</td>
</tr>
</tbody>
</table>

Legend: Descriptive Interpretation (DI); Average Weighted Mean (MEAN); 4.20 – 5.00 = Constantly Demonstrated (CD); 3.40 – 4.19 = Frequently Demonstrated (FD); 2.60 – 3.39 = Occasionally Demonstrated (OD); 1.80 – 2.59 = Rarely Demonstrated (RD); 1.00 – 1.79 = Scarcely Demonstrated (SD)
As gleaned from the table, the seven scales on how a health practitioner exhibits caring to their patients. Generally, it was perceived as frequently demonstrated which the same with the mentors is. This shows that health care professionals regularly, routinely or oftentimes perform these caring behaviors to their patients. However, the result of this study negates the finding of a study that recommends empowering nurses to engage in positive health behavior through education.17

Moreover, health trend now is to foster a healthy, safe and supportive environment. Everywhere people go especially in healthcare facilities, signs of safety first are posted. However, from the seven scales of caring behaviors, only six were demonstrated frequently that is something to look upon. Expression of positive or negative feelings and existential/phenomenological/spiritual was the one perceived as occasionally demonstrated. Existential can be a reference to survival while phenomenology is the inquiries that addresses the practices of professionals in everyday life and spiritual force is the faith to practice profession. This is somewhat unbelievable because this is referring to sincerity and commitment of a health professionals related the services they can give to their patients.

To validate if there is an implication of the caring behavior of health educators in the academe on how health practitioners exercise their vocation in the clinical area, independent sample t-test was used. The caring behavior of health professional were fully demonstrated as perceived by students and patients. Table 3 presented the inference if there is significant difference on caring behaviors of health care professionals that implicates clinical practice. As gleaned from the table, caring behavior of health academician (M = 3.95, SD = 1.72, N = 4) was not significantly different from the health practitioners (M = 3.86, SD = 0.09, N = 4), t-value = 2.664, p = 0.154.
The finding revealed that, how a learner be educated depicts how they will practice their profession in the future. The good portrayal of caring behaviors by the educators to their learners will determine how learners be molded that will affect how they will practice after graduation. This is because of its influence that is crucial to the learning process. One thing, caring behavior is imperative to learner’s personality, academic and non-academic achievement for it influences them how to get into it. That influence will implicate how they will practice once they will graduate.

To substantiate the interpreted and analyzed numerical data, ten patients from the respondents in the quantitative part of this study were subjected to follow-up interview after confirmation of participation. Patients were asked about their experiences and the traits they observed from the health professionals during interaction that made them listen, participate and follow instructions. Responses were transcribed as basis in coming up with initial coding and was categorized. Finally, three categories were foster wellbeing, ensuring proficiency and patient’s engagement while the themes drawn were human needs assistance, competence, commitment and psychosocial support.

The findings show a good impact and proves that “how an individual be learned and nurtured depicts how they will perform”. However, it is still a need to constantly demonstrate those caring behaviors for it was suggested that health education should be delivered to patients according to their learning style in order for patients to comprehend and retain information provided.\(^\text{18}\)

**Conclusion and Recommendation**

The findings show a good impact and proves that “how an individual be learned and nurtured depicts how they will perform in the future”. Therefore, demonstration of caring behaviors is fundamental to uphold to learners for it significantly contribute a great impact on their behavior as future professional in the healthcare arena. One thing, caring behavior of health professionals as academician is an essential element of developing a student’s personality as future health professional practitioners. Thus, it is highly recommended to uphold and disseminate the critical aspects of caring behaviors among learners in developing them as future health professional practitioners.

**Conflict of Interest:** There is no professional, personal or family allegiance, bias, inclination, obligation or loyalty which may in any way affects the objectivity, independence or impartiality in the accomplishment of this study.

**Funding:** This research did not receive any specific grant from funding agencies in the public, commercial, or non-for-profit sectors.

**Ethical Clearance:** Guidelines for the protection of human rights outlined in the American Nurses Association\(^\text{19}\) was observed.

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Community-Based Rehabilitation Program in the Municipality of Bauko, Mountain Province, Philippines

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Abstract

Community-based rehabilitation is a beneficial treatment of addiction as it provides opportunities to learn how addiction settles into a healthy mind and body and how it can be beleaguered. At this point, Bauko municipality in the Mountain Province, Philippines designed a community-based rehabilitation program to cater the health needs of drug surrenderees or scholars under the government program “TOKHANG”. No visible impact was determined that made this study to assess its effectiveness for possible enhancement. Qualitative method was utilized where focus group discussion, key informant interview and observation were employed where thematic strategy was utilized in data analysis.

There was an improvement noted to wellness of the scholars after the implementation of the said program. Moreover, the program contributed best to the peace and order, strong family relationship and to the health and safety of the surrenderees. On the other hand, four significant areas were considered to enhance the program and strong support of stakeholders is vital. Indeed, high satisfaction with the program was noted.

Keywords: Drug surrenderees or scholars, community-based rehabilitation program, physical and psychosocial wellness, Bauko Municipality.

Introduction

Addiction to prohibited substances was one of the major problems that the Philippine Government is facing nowadays. It was considered a complex but treatable disease affecting brain functions and behavior. Thus, addiction can be treated but it has to undergo processes through rehabilitation. At this point, project “Tokhang” was developed by the Philippine Government that is a practical and realistic means of accelerating the drive against illegal drugs in affected barangays. This concept involves the conduct of house to house visitations to persuade suspected illegal drug personalities to stop their illegal drug activities.¹ Project “Tokhang” was launched by the Philippine National Police (PNP) to target the drug-infected barangays in coordination with the local government units² through the Philippines Dangerous Drugs Act of 2002 (Republic Act No. 9165) and the Philippines Local Government Code (Republic Act No. 7160) reinforced by Executive Order No. 4 of 2016 to provide establishment and support of drug abuse treatment and rehabilitation centers throughout the country.

In rehabilitation, the residents learn new lifestyle, principles and coping mechanisms that will help them overcome drug addiction.³ Treatment should include development of specific cognitive skills to help the offender adjust attitudes and beliefs that lead to drug abuse. This includes skills related to thinking, understanding, learning and remembering.⁴ Further, its the behavioral interventions designed to influence the behavior changes in a way that benefits addicts and the society for its goal is to return people to productive functioning in the family, workplace and community.⁵ Furthermore, community-based treatment is a specific integrated model for people affected by drug use...
and dependence in the community which provides a continuum of care from outreach and low threshold services, through detoxification and stabilization to aftercare and integration in coordination of health workers, social and other non-specialist services with strong support by family and the community to ensure efficient and long-term results.

In the Philippines, drug addiction is a major concern where rehabilitation facilities are not enough to accommodate surrenderees. Indeed, the Philippine Government challenged everyone to devise own rehabilitation program to cater the health needs of people involved. At this point, the Local Government Unit (LGU) of Bauko conceptualized a community-based rehabilitation program (CBRP) in rehabilitating the surrendered drug personalities. However, the impact of the program is not visible that made this study to furtherly assess if how effective its implementation and the possible recommendations as basis for enhancement.

**Methodology**

Descriptive qualitative method of research was used and participants were the drug surrenderees of the entire municipality. Purposive-convenience sampling was utilized where selection of participants is criterion-based and though participants are entirely known, available drug scholars during the scheduled data collection were considered. Focus group discussion was the primary technique in gathering data. The question revolved on the implementation of CBRP focusing on its effectiveness, contributions to the community and suggestions on how the program can be enhanced. Moreover, an open-ended interview guide and an observation checklist based on the foci of this study were utilized to evaluate the effectiveness and contributions to scholars and the community, and recommendations for the enhancement of the program. Gathered data were transcribed into categories, synthesized then analyzed by themes and quantified.

**Results and Discussions**

Use of prohibited drug involves serious risks at which, the more a person use, the greater the risks become. At this point, provision of a comprehensive therapy not only the mental and emotional but foremost its physical wellbeing is vital. One thing, psychological wellbeing is related to emotional and social knowledge that influenced the overall ability to effectively cope with environmental demands. The CBRP is a comprehensive therapy that was implemented with five steps. Organizing is the first where a Community Rehabilitation Network (CRN) was developed and oriented on how the program is implemented. Next is enrollment of drug surrenderees which requires medical tests by the Department of Health (DOH) for only low and medium risk users are allowed. This was supported by a that “low- or mild-risk” drug users need not be admitted in the rehabilitation centers but can be catered through community-based treatment.

Third step is program orientation of both enrollees and their families followed by the rehabilitation proper. In this segment, patient’s care involved sessions on the understanding of the individual as patient, sharing of experiences, lectures/seminars, individual and group counseling, skills training, physical activities and community service. Evaluation is the final step that requires drug recovering patients to undergo an unannounced drug test while they will be assessed on how well they fared with the activities done.

**Effect of Community-based Rehabilitation Program to wellbeing of scholars/drug surrenderees:**

Wellbeing is essential to everybody’s life. It denotes health, happiness and satisfaction. In this study, there were three (3) categories involved which are physical, psychological and social wellbeing. Initially, the effectiveness of CBRP on physical wellbeing shown in table 1 was more on the body physique followed by their aura then by their body strength and comfort. Moreover, there was low percentage of responses noted from the participants. This is for the reason that only 67 out of 90 scholars were available the time of follow up after the implementation of the said program. Based from the program implementers, those who were not available are with their family at home to immerse in more complex community environment.
Table 1: Physical Wellbeing Before and After the Implementation

<table>
<thead>
<tr>
<th>Before CBRP</th>
<th>After CBRP</th>
<th>%</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body weakness</td>
<td>Body Strength</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>Rheumatoid Arthritis</td>
<td>Still but the exercises helped</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Uneasy feeling</td>
<td>Comfortable</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Skinny body appearance</td>
<td>Improved body built and weight</td>
<td>22</td>
<td>1</td>
</tr>
<tr>
<td>Dark Physical Aura</td>
<td>Improved</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>Vision and hearing not clear</td>
<td>Improved</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Frequent headache</td>
<td>Minimized</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

Meanwhile, rheumatoid arthritis was last seen because minimal number from the scholars experienced the case. However, it should not be ignored. Indeed, the findings proved that having physical exercise such as jogging, push-up, sit-up from 5:00 to 7:00AM before breakfast and wash up, tree planting and gardening are effective remedies for regaining physical wellbeing. Further, the regular check-up conducted by the Municipal Health Unit and proper food intake also contributed to the physical wellbeing of the scholars.

On the other hand, table 2 reflected eight common psychological disturbances experienced by the scholars. It was noted that being shameful was the most reduced followed by being suspicious which is just the same with the most one after the program. Nice to know that self-esteem of scholars was regained and boosted because, this is the most important characteristic of an individual to live in this world freely and confidently.

Table 2: Psychological Wellbeing Before and After Implementation

<table>
<thead>
<tr>
<th>Before CBRP</th>
<th>After CBRP</th>
<th>%</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easily Irritated</td>
<td>Controlled emotions</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Laziness</td>
<td>Active to work</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>Suspiciousness/paranoia</td>
<td>Undoubted</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>Anxiety/Fearful</td>
<td>Relax/fearless</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Self-pity</td>
<td>Positive life outlook</td>
<td>8</td>
<td>5.5</td>
</tr>
<tr>
<td>Poor sleep pattern</td>
<td>Improved sleep pattern</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>Confused</td>
<td>Clear thoughts and Focused/Goal oriented</td>
<td>8</td>
<td>5.5</td>
</tr>
<tr>
<td>Ashamed to people</td>
<td>Gained confidence</td>
<td>24</td>
<td>1</td>
</tr>
</tbody>
</table>

Furthermore, Sleepiness is one of the common manifestations of psychological disturbance that can lead to psychosis if prolonged. Other notable observations were reduced such as craving for drugs; improved values and character of being respectful is evident;active participation in the activities;obedient with camp rules; developed leadership skills; and improved self-esteem.

Though there were some negative feedbacks, the positive effect of CBRP was noted from most of the scholars.

As to social wellbeing, table 3 revealed that lower levels were found to be the strongest predictors of negative mental health.
It has been noticed that improvement in socialization was the first observed and reported followed by their self-esteem which was more developed. Good to know that their spiritual life was given an importance for only GOD our creator knows what is best for us. Though respect to elders was the least that was managed, CBRP is still considered an effective for the reason that, as per culture, not only Cordillerans but most of Filipinos are hospitable. No matter what kind of situation or occurrence, respect to elders is still being practiced. Hence, social wellbeing can cope more successfully due to the social nature of human life and their challenges and it cannot be ignored to pay attention of the social aspect of health.

**Contributions of the Community-based Rehabilitation Program:** Peace in the Philippines related to drug abuse consistently ranked in the top five urgent national concerns in nationwide surveys since 2004.9 At this point, community plays a vital role in resolving conflicts and promoting peace most especially in terms of drugs and abused drugs.

Table 4 revealed that CBRP is an advantage to peace and order of concerned citizen because most of the major factors disturbing the social welfare of the people in the community were reduced and minimized. Scholars became a part of the community’s activities that were worthwhile and the usual violations they do were reduced and eliminated. The community became safer and more peaceful because no more troubles happened and some people even stayed late at night for bonding and public disturbance and drunkenness were also reduced as reported.

**Table 3: Social Wellbeing Before and After Implementation**

<table>
<thead>
<tr>
<th>Before CBRP</th>
<th>After CBRP</th>
<th>%</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selfishness</td>
<td>Concern to help others</td>
<td>6</td>
<td>5.5</td>
</tr>
<tr>
<td>Don’t know God</td>
<td>Attends mass, fellowship and bible study to</td>
<td>19</td>
<td>3</td>
</tr>
<tr>
<td>households</td>
<td>Improved social relationship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor relationship to others due to</td>
<td>Confident</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>suspiciousness/paranoia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strange feeling</td>
<td></td>
<td>23</td>
<td>1</td>
</tr>
<tr>
<td>Social stigma</td>
<td>Confident, Appreciated</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>Fear to PNP</td>
<td>Minimized</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>No respect to elders</td>
<td>Managed</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>People don’t trust you</td>
<td>Minimized</td>
<td>6</td>
<td>5.5</td>
</tr>
</tbody>
</table>

**Table 4: Contributions to Peace and Order**

<table>
<thead>
<tr>
<th>Before CBRP</th>
<th>After CBRP</th>
<th>%</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stealing</td>
<td>Reduced</td>
<td>8</td>
<td>6.5</td>
</tr>
<tr>
<td>Drunkenness disturbance at night</td>
<td>Minimized</td>
<td>21</td>
<td>2</td>
</tr>
<tr>
<td>Drug users in the community</td>
<td>Reduced</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Violations of ordinances</td>
<td>Reduced</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>Motorcycles disturbance at night</td>
<td>Minimized</td>
<td>23</td>
<td>1</td>
</tr>
<tr>
<td>Disturbance from barking dogs at night</td>
<td>Minimized</td>
<td>18</td>
<td>3</td>
</tr>
<tr>
<td>More bystanders</td>
<td>Reduced</td>
<td>8</td>
<td>6.5</td>
</tr>
<tr>
<td>Most of drug user do not help in the community due to effects of drugs</td>
<td>Able to extend</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Disobedience/desrespect to Barangay Officials</td>
<td>Minimized</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Drinking alcohol late at night</td>
<td>Minimized</td>
<td>8</td>
<td>6.5</td>
</tr>
<tr>
<td>Drug user works in the garden at night</td>
<td>Minimized</td>
<td>8</td>
<td>6.5</td>
</tr>
</tbody>
</table>
The effectiveness of the program to peace and order is somewhat a standpoint to remember. If this program is effective to drug addicts that made changes to the community, how much more if it will also be applied to other community related problems that affects the peace and order of a locality.

On the other hand, good community relationship is the basic and most important social skills that came from families. It has a great impact on the society and the society influences the operations of a country.

Table 5 showed contributions of the program to family relationship. There were factors affecting the relationship of scholars to their family brought by prohibited drugs or substances that made their personality different of who they are prior to involvement. As gleaned from the table, most of them found to be more responsible with closer family ties which is opposite to who they are before the therapy. Moreover, changes in the life of scholars were almost 360 degrees as to its angle. This means that CBRP plays a vital role in the promotion of relationship of the scholars with their families.

### Table 5: Contributions to Family Relationships

<table>
<thead>
<tr>
<th>Before CBRP</th>
<th>After CBRP</th>
<th>%</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disrespect/Disobedience</td>
<td>Positive relationship</td>
<td>13</td>
<td>5.5</td>
</tr>
<tr>
<td>Don’t Pray</td>
<td>Leads prayer and teach GOD</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>Poor communication</td>
<td>Good relationship</td>
<td>11</td>
<td>8.5</td>
</tr>
<tr>
<td>Poor relationship in many aspects/irresponsible</td>
<td>Good relationship/responsible</td>
<td>86</td>
<td>1</td>
</tr>
<tr>
<td>Don’t sleep at home with family</td>
<td>Sleep and work with them</td>
<td>11</td>
<td>8.5</td>
</tr>
<tr>
<td>Eat alone most of the time</td>
<td>Dine with family</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>Communicate harsh</td>
<td>Kind and show respect</td>
<td>19</td>
<td>3</td>
</tr>
<tr>
<td>Illegal source of income to the family</td>
<td>Work hard legally for the family</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>No bonding time with family</td>
<td>Go home early to eat, tell story</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>I don’t go with my family to church</td>
<td>We all go to church</td>
<td>13</td>
<td>5.5</td>
</tr>
</tbody>
</table>

Indeed, family gives the strength needed to get through the bad times and celebrates the good times. Strong relationships among family members are essential to keeping a family together for it is the basic glue that holds society together.

Furthermore, people who are affected by drug use and dependence will be offered help to improve the overall quality of their life and wellbeing through social support for rehabilitation and reintegration. With this, CBRP is a social support that can promote the health and safety of drug scholars. It was gleaned from table 6 that health and safety of drug scholars were improved, managed and minimized. There were great changes on their health and safety wherein most regained their physical energy that made them comfortable and started to forget bad habits. These denotes the great contribution and signifies the effectiveness in the implementation of the program.

### Table 6: Contributions to Health and Safety

<table>
<thead>
<tr>
<th>Before CBRP</th>
<th>After CBRP</th>
<th>%</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of energy to work and body fatigue.</td>
<td>Improved physical energy and motor</td>
<td>36</td>
<td>1</td>
</tr>
<tr>
<td>Below normal weight</td>
<td>Normal weight</td>
<td>8</td>
<td>5.5</td>
</tr>
<tr>
<td>Feeling of body weakness and discomfort</td>
<td>Comfortable</td>
<td>27</td>
<td>2</td>
</tr>
<tr>
<td>Sleep problem</td>
<td>Managed</td>
<td>23</td>
<td>3</td>
</tr>
</tbody>
</table>
Recommendations to Enhance the Effectiveness of Implementation: There are four (4) significant areas recommended to enhance the effectiveness of the program implementation. First is Holistic Approach that integrated physical, mental and spiritual model. This approach helps in preparing the surrenderees’ reintegration with the community. Next is the Family Support and Involvement which is significant during the stay-in program contributing a positive impact on psychological wellbeing.

Third is Community Support and Involvement which is a patient-centered style of therapeutic interaction that facilitates support wherein, treatment becomes faster if community people understand the situation. And the last is Partnership with stakeholders and community in support to the restoration of wellness of drug scholars for this initiates a collaborative effort.

Conclusion and Recommendations

Effectiveness in the implementation of the community-based rehabilitation program was noted for it has great contributions to peace and order, family relationships and health and safety of the community. Further, it is contributory to the development of good physical outlook, worthy relationship with family and community members showing positive spiritual values, respect and sense of responsibility. Therefore, it is highly recommended that sustainability of the program should be maintained to cater those who are not able to avail; the four significant areas of concern should be considered; intensive anti-drug campaign, community awareness and capability-building should be seriously implemented; and strengthen the community support system for drug prevention by building healthy public policy that foster the health of the community.

Conflict of Interest: This has no impartiality in its accomplishment.

Source of Funding: Personal

Ethical Clearance: Guidelines for the protection of human rights outlined in the American Nurses Association10 was observed.

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Effects of Health-Related Perception, Physical Activity Practice Rate and Stress on Health-Related Quality of Life for Middle-Aged Women: Based on the Seventh Korea National Health and Nutrition Examination Survey (KNHSNES 7-3), 2017, Korea Centers for Disease Control and Prevention

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Abstract

Background/Objectives: The purpose of this study was to identify the factors which may influence a health related quality of life in middle age women in Korea.

Method/Statistical Analysis: This study used the 7th (2017) primitive data disclosed by the National Health Nutrition Examination Survey. Considering the design features of the sample data, it is analyzed with a complex sampling method by reflecting stratas, clusters and weight. The data were analyzed using descriptive statistics of the complex sample, general linear model of the complex sample and multiple regression using the SPSS/WIN 18.0 program.

Findings: As a result of conducting the regression analysis, the explanatory power of above 3 variables appeared to be 16% including subjective health status (β =-.055, p<.001), Perceived stress (β =. 016, p=.007) and subjective body shape (β = .011, p = .012).

Improvements/Applications: This study will be used as basic data for developing nursing intervention programs that can improve health related quality of life of middle age by establishing factors that affect well-being of middle age using variables of multilateral aspects.

Keywords: Mid-life Women, Quality of life, Perceived health perception, physical activity.

Introduction

The average life expectancy in 2018 was 82.7 years, 3.5 years longer than the average of 79.2 years in 2007[1]. The interest in health-related quality of life, which intends to maintain a healthy life in accordance with the life extension. Women, in particular, evaluated their health conditions worse than men[2]. Women’s health profile was reported to be weaker than men[3]. In many studies, as women are reported to have a lower quality of health-related life compared to men[4-5], the management plan should be prepared for the quality of women’s health-related life. Middle age is a transition period from adulthood to old age, which is a period feeling psychological crisis due to the decline in physical health, changes in family life cycles and loss of social roles[6]. These changes and health problems in middle-aged women reduce the quality of life of them[7].

Health-related quality of life is the levels of health in terms of physical, psychological and social aspects according to personal experiences, beliefs, expectations, or cognitive levels[8]. Health-related quality of life is one of the resulting indicators of the health-related
intervention[9] and can be judged as a result of health-related quality of life for middle-aged people or as a result of nursing interventions. As factors affecting the health-related quality of life, the more obese, the lower the health-related quality of life[10-11], the higher the social activities[12] or the better the walking practice rates[11,13], the higher the health-related quality of life. It was reported that the lower the standard of living[12,14], the lower the perceived health condition[15] the higher the stress, the lower the health-related quality of life[16].

Most studies on the health-related quality of life so far have targeted elderly people[12,15] or focused on middle-aged menopause symptoms[17] or related to certain diseases[18]. Therefore, focusing on middle-aged women among the relevant factors reported so far, an integrated analysis of the relevant factors up to date is needed.

Therefore, the study sought to look at how health-related perception, physical activity practice rates and stress affect health-related quality of life. Through this, we would like to present basic data on the development of nursing intervention programs that can systematically manage the health-related quality of life of middle-aged women. The specific purpose of the study is first to identify differences in the health-related quality of life according to the demographic characteristics and related variables of middle-aged women. The second is to identify the effects of health-related perception, stress and physical activity practice rates on health-related quality of life in middle-aged women.

**Method**

**Subjects:** This study used the 7th (2017) primitive data disclosed by the National Health and Nutrition Examination Survey in accordance with regulations for disclosure and utilization of primitive data from the Korea Centers for Disease Control and Prevention. The sample design of the National Health and Nutrition Examination Survey was extracted using two-stage stratified cluster sampling[19]. The number of 7th survey subjects was 8,127. Among them, 1,367 women aged 45 to 64 were the final subjects for this study.

**Instruments:**

**Health-related Quality of life:** Health-related quality of life is a tool developed by Euro QOL of group that evaluates from one point to three for five dimensions: mobility, self care, usual activities, pain/discomfort and anxiety/depression. EQ-5D Index is calculated by multiplying each score in five dimensions by weight value and closer to 1, the higher the health-related quality of life[20].

**Health-related perception:** Health-related perception consist of subjective health status and subjective body shape. Regarding the subjective health status, ‘very good, good’ was defined as ‘good’, ‘normal’ as ‘normal’ and ‘bad, very bad’ as ‘bad’. The Subjective body shape was reclassified as ‘obese, average’ and ‘thin’.

**Perceived stress:** Stress refers to perceived the stress rate, which is that the numerator was categorized into the group that felt ‘very a lot’ and group that felt ‘a lot’ of stress in their daily lives and the denominator was categorized into the group that felt ‘less’ and group that felt ‘a lot’[19] of stress, with a number calculated as the number of subjects aged 12 or older.

**Aerobic physical activity practice rate:** The aerobic physical activity practice rate was categorized depending on whether medium-intensity physical activity with more than 2 hours and 30 minutes, or whether high-intensity physical activity with more than 1 hour and 15 minutes, or whether combined with medium-intensity and high-intensity physical activity per week[19].

**Data collection:** The data was surveyed by the surveyors from January to December 2017 with interviews and questionnaire.

**Ethical consideration:** Regarding the National Health and Nutrition Examination Survey, since 2015, the study directly for public welfare has conducted without the review by the Research Ethics Committee in accordance with the Bioethics Law and the Enforcement Rules of the same Law[19].

**Data analysis:** To establish the representative nature of the samples for the population, the complex sampling method was used by reflecting the strata, cluster and weight in consideration of the sample design characteristics of the data[19]. The data were analyzed using descriptive statistics of the complex sample, general linear model of the complex sample and multiple regression using the SPSS/WIN 18.0 program.
Result and Discussion

General characteristics of subjects: The average age of subjects was 53.95 years old. The average health-related quality of life for all subjects was 0.96. The health-related quality of life showed significant differences in accordance with the income level (F=5.74, \( p=.001 \)), education level (F=12.90, \( p<.001 \)), subjective health status (F=8.06, \( p<.001 \)), subjective body shape (F=9.16, \( p<.001 \)), perceived stress (F=4.06, \( p<.001 \)). On the other hand, the aerobic physical activity practice rate (F=-0.59, \( p=.550 \)) showed no significant differences in the health-related quality of life [Table 1].

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Categories</th>
<th>N</th>
<th>W% or M±SD</th>
<th>EQ-5D M±SD</th>
<th>Wald F (P)</th>
<th>Contrast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1367</td>
<td>53.95±0.18</td>
<td>.96±0.002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>Low(^a)</td>
<td>343</td>
<td>24.2</td>
<td>.94±0.005</td>
<td>5.74 (.001)</td>
<td>a&lt;c a&lt;d</td>
</tr>
<tr>
<td></td>
<td>Medium low(^b)</td>
<td>347</td>
<td>24.1</td>
<td>.95±0.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medium high(^c)</td>
<td>334</td>
<td>25.5</td>
<td>.96±0.004</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High(^d)</td>
<td>340</td>
<td>26.3</td>
<td>.97±0.004</td>
<td></td>
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</tr>
<tr>
<td>Education</td>
<td>Elementary</td>
<td>239</td>
<td>16.7</td>
<td>.91±0.009</td>
<td>12.90 (&lt;.001)</td>
<td>a&lt;b a&lt;c a&lt;d</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>203</td>
<td>15.1</td>
<td>.95±0.006</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>480</td>
<td>40.2</td>
<td>.97±0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>College</td>
<td>335</td>
<td>27.9</td>
<td>.97±0.004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective health status</td>
<td>Bad</td>
<td>235</td>
<td>18.2</td>
<td>.90±0.008</td>
<td>-8.06 (&lt;.001)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good</td>
<td>1028</td>
<td>81.8</td>
<td>.97±0.002</td>
<td></td>
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<tr>
<td>Subjective body shape</td>
<td>Under weight(^a)</td>
<td>141</td>
<td>11.0</td>
<td>.95±0.011</td>
<td>9.19 (&lt;.001)</td>
<td>a&gt;b</td>
</tr>
<tr>
<td></td>
<td>Average(^b)</td>
<td>501</td>
<td>37.3</td>
<td>.97±0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overweight(^c)</td>
<td>670</td>
<td>51.6</td>
<td>.95±0.003</td>
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<tr>
<td>Perceived stress</td>
<td>Low</td>
<td>958</td>
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<td>.97±0.002</td>
<td>4.06 (&lt;.001)</td>
<td></td>
</tr>
<tr>
<td></td>
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<td>350</td>
<td>28.3</td>
<td>.94±0.006</td>
<td></td>
<td></td>
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<tr>
<td>Aerobic physical activity practice rate</td>
<td>No</td>
<td>741</td>
<td>59.2</td>
<td>.96±0.003</td>
<td>- .59 (.550)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>515</td>
<td>40.8</td>
<td>.96±0.004</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Factors affecting health related quality of life of subjects: To identify the factors affecting health-related quality of life, the income level and education level were adjusted and the general linear model analysis of complex sampling was conducted. The result showed that subjective health status (\( \beta = -.055, p<.001 \)), perceived stress (\( \beta = .016, p=.007 \)), subject body shape (\( \beta = .011, p=.012 \)) were appeared as influencing factors on health-related quality of life. The explanatory power of these variables on health-related quality of life accounted for 16 percent. The most influential of these variables was subjective health status [Table 2].

<table>
<thead>
<tr>
<th>Variables</th>
<th>Parameter estimate</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>.964</td>
<td>.008</td>
<td></td>
<td>.000</td>
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<tr>
<td>Aerobic physical activity practice rate = no</td>
<td>-.020</td>
<td>.004</td>
<td>-6.31</td>
<td>.620</td>
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<tr>
<td>Aerobic physical activity practice rate = yes (reference)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variables</td>
<td>Parameter estimate</td>
<td>SE</td>
<td>t</td>
<td>p</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>--------------------</td>
<td>-----</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Subjective body shape = under wt</td>
<td>-.002</td>
<td>.012</td>
<td>-.15</td>
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<tr>
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<td>.011</td>
<td>.004</td>
<td>2.53</td>
<td>.012</td>
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<tr>
<td>Subjective body shape = over wt (Reference)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective health status = 0(bad)</td>
<td>-.055</td>
<td>.008</td>
<td>-6.75</td>
<td>.000</td>
</tr>
<tr>
<td>Subjective health status = 1(good) (Reference)</td>
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<td></td>
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</tr>
<tr>
<td>Perceived stress = 0(low)</td>
<td>.016</td>
<td>.006</td>
<td>2.75</td>
<td>.007</td>
</tr>
<tr>
<td>Perceived stress = 1(high) (Reference)</td>
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</tr>
<tr>
<td>Income = low</td>
<td>-.004</td>
<td>.007</td>
<td>-.63</td>
<td>.529</td>
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<tr>
<td>Income = medium low</td>
<td>-.006</td>
<td>.006</td>
<td>-.92</td>
<td>.360</td>
</tr>
<tr>
<td>Income = medium high</td>
<td>.002</td>
<td>.005</td>
<td>-.29</td>
<td>.767</td>
</tr>
<tr>
<td>Income = high (Reference)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education = elementary</td>
<td>-.045</td>
<td>.010</td>
<td>-4.63</td>
<td>.000</td>
</tr>
<tr>
<td>Education = middle</td>
<td>-.013</td>
<td>.008</td>
<td>-1.77</td>
<td>.079</td>
</tr>
<tr>
<td>Education = high</td>
<td>-.002</td>
<td>.005</td>
<td>-.43</td>
<td>.667</td>
</tr>
<tr>
<td>[ ] Education = college (Reference)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wald F = 9.54, p&lt;.000, R² = .16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Adjusted for income, education

**Discussion**

In this study, the effects on the health-related quality of life of middle-aged women were analyzed using the National Health and Nutrition Examination Survey data in Korea. Health-related quality of life is the perception of what one’s life is like in a health system that is related to the purpose, expectations, standards and interests of an individual[8]. In this study, the level of health-related quality of life for middle-aged women was 0.96, higher than the result of 0.91 in women in their 50s[3] or 0.95 in men and women in their 40s or 0.92 in their 50s[4]. However, it is difficult to compare directly because the subjects of the study are different and the figures can vary depending on the weighted model applied to the EQ5D Index.

Subjective health status among health-related perception under adjust of income levels and living standards was found to be the most influential variable in health-related quality of life, which is similar the results that the lower the subjective health status of middle-aged women, the lower the health-related quality of life[17] and subjective health conditions are the factors affecting health-related quality of life[4,15,18,22]. As the health-related quality of life is directly and indirectly affected by an individual’s health condition, physical, mental, social health status, etc[8]. It is thought to be the most influential.

The second most influential variable was perceived stress and the lower the perceived stress, the higher the health-related quality of life. This is explained in the same context as the results[4,16,18] of perceived stress as an influence variable of health-related quality of life among the influencing variables of health-related quality of life of middle-aged women. Middle-aged women experience many conflicts and stresses by experiencing internal and external life events while playing the main role of family members, resulting in the low quality of life[16]. As stress increases, the quality of life decreases due to decreased physical and mental functions and decreased social-psychological adaptability[4].

The Third influential variable in health-related quality of life was subjective body shape, which showed high levels of health-related quality of life in average-sized people. This is similar to the result that obesity was a factor influencing health-related quality of life[10]. In some studies, It is a contrary result to the result that there was no difference in the health-related quality of life[12] in accordance with the result of BMI, but it is thought
that it was difficult to objectively evaluate satisfaction and dissatisfaction with the BMI value. For that reason, it did not appear as an influencing factor when the BMI value was selected as a variable. As the health-related quality of life depends on how individuals perceive their body shapes rather than on the figure itself, such as BMI, it is thought that the satisfaction of body shape in this study was a variable affecting the health-related quality of life.

Aerobic physical activity practice rate has been shown not to affect health-related quality of life, which differs from the results of health-related life quality studies\(^\text{[11,13]}\). This is believed to have not affected the health-related quality of life as the subjects of this study are middle-aged women, not feeling much of the limitation of physical activity compared to the elderly. There were significant differences in health-related quality of life depending on general characteristics, education levels and income levels. This is similar to the study results\(^\text{[10,12,18,21]}\), which showed that the health-related quality of life is the influencing factor in accordance with the education levels. It is believed that education affects the economic, psychological and social aspects of our lives. It is similar to the study results\(^\text{[12]}\) that showed that the standard of living is a factor affecting health-related quality of life. Low economic standards do not satisfy the needs for survival, as the satisfaction with life decrease through comparison with people around.

This study is significant in the sense that it is representative as it utilized the country’s primitive data and that it compared and analyzed factors related to health-related quality of life in middle-aged women. Therefore, in order to improve the health-related quality of life in middle-aged women, the development of intervention programs such as education and stress management programs that can affect health perceptions and changes in health behavior for body shape management are necessary.

**Conclusion**

This study sought to identify the relative importance of the influencing factors by identifying those of health-related quality of life for middle-aged women. Factors affecting the health-related quality of life for middle-aged women include subjective health perception, stress and subjective body shape and these variables explain 16 percent of health-related life quality. Therefore, management of these variables should be considered in strategies for improving the health-related quality of life for middle-aged women. It is significant in the sense that the results of this study compare and analyze factors related to the health-related quality of life for middle-aged women in Korea. However, due to the low explanatory power for the health-related quality of life, it is suggested to explore factors affecting the health-related quality of life not included in this study and to identify direct and indirect effects by building models.

**Ethical Clearance:** Not required

**Source of Funding:** Nil

**Conflict of Interest:** Nil

**References**


7. Nisar N, Sohoo NA. Frequency of menopausal symptoms and their impact on the quality of life of
Study on Pattern of Lip Prints and its Relation to Sex and Blood Groups in Telangana Population

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¹Professor & Hod, ²Internee, Mediciti Institute of Medical Sciences, Medchal

Abstract

A cross sectional study on the pattern of lip prints was conducted among the population of Telangana region. A sample of 140 individuals comprising of 70 males and 70 females were taken from both medical and nursing students of the Mediciti Institute of Medical Sciences, Medchal, Telangana.

The present study showed type-1 (vertical groove running across the lip) is the most common pattern present in all the quadrants of the lip in both males and females. In the left upper quadrant, it is found to be 51.4%, followed by 37.1% in the left upper right quadrant, 49.3% in the lower left quadrant and 53.6% in the lower right quadrant. Type-2 pattern (vertical partial length groove) is the second common pattern, in the upper left quadrant, it is 37.1%, in the upper right 42.1%, in the lower-left 34.3% and lower right quadrant 27.9%. Type-3 (Branched groove) observed as the third common pattern in the study population, in the upper left quadrant it is 11.4%, upper right 18.6%, lower left 15.7%, lower right quadrant 17.9%. Type-5 (Reticular pattern) is noticed in the upper right quadrant in 1.4%, lower left 0.7%, lower right 0.7% and not found in the upper left quadrant. The type-6 pattern is found upper right quadrant in 0.7% of study population and Type-4 pattern (intersected groove) is not found in our study group.

Our study revealed that the pattern of lip prints for each individual in each quadrant is unique. According to our study, there is no sex difference with lip print patterns. Study also revealed that there is no relation between lip print patterns and the blood groups, a near significant relation observed with the chi-square test in one quadrant, but not considered as significant.

Lip print patterns are constant, do not change with time and the uniqueness of its nature in each individual, it can be used for personal identification in various medico-legal issues.

Keywords: Lip prints, Personal identification, Crime investigation, Relation to sex, Relation to blood groups.

Introduction

Lip prints have a great significance in medico-legal issues. Identification plays a major role in any criminal investigation. The external surface of lips has many elevations and depressions forming a characteristic pattern called lip prints, examination of which is known as cheiloscopy. The lip prints are unique and distinguishable for every individual like fingerprints.¹

R. Fischer in 1902 was the first anthropologist to describe the furrows on the human lips.² In 1932, a French criminologist, Edmond Locard recommended the use of lip print for identification of a person.³ The idea of using lip print for identification was first suggested by Le Moyne Snyder in the year 1950.⁴ In 1972, Mc Donell reported that two identical twins seemed to be
indistinguishable by every other means, but their lip prints were different\(^1\) like fingerprints.

The lip prints, being uniform throughout life and it is the characteristic to a person, it can be used to verify the presence or absence of a person from the crime, provided there has been consumption of beverages, drinks, usage of cloth, tissues or napkin etc., at the crime scene. However, studying in-depth and establishing further facts and truth in lip prints will certainly help as useful evidence\(^5\) in crime investigation.

The present study aimed, to study the lip prints of different individuals in both upper and lower lip and find out the various patterns in the study population, to identify the most common pattern of Lip prints in the region of Telangana, to observe any gender differences and to find out any relation with the blood group. Several studies were conducted worldwide and in many parts of the country, but very few studies are available in the region of Telangana.

To classify lip prints we chose the classification scheme proposed by Suzuki and Tsuchihashi in 1970\(^6\) which is as follows: Type-1: A clear-cut groove running vertically across the lip.

Type-2: Vertical Partial-length groove.

Type-3: A branched groove.

Type-4: An intersected groove.

Type-5: A reticular pattern.

Type-6: Other patterns.

**Materials and Method**

A cross sectional study on pattern of lip prints was conducted in Telangana region in the year 2019. A sample of 140 individuals comprising of 70 males and 70 females, both medical and nursing students of Mediciti institute of Medical sciences, Medchal of Telangana area were taken in the study. All healthy individuals in the age group of 18 to 25 years with known blood groups were selected for this study. Individual Lips free from any pathology and having absolutely normal transition zone between the mucosa and skin were considered in this study. Individuals with any disease, cuts, injuries and deformities on lips were excluded. Informed consent was taken from all the individuals before commencement of the study.

The materials used in this study were Brown colored lipstick (Revlon), Cellophane tape, White chart paper and Magnifying lens.

Method adopted for collection of lip prints as follows: Both upper and lower lips of the individual were cleaned and a brown colored lipstick was applied on the lips uniformly. Over the lipstick, a white paper was used for impression of the lip prints. Subject was asked to make a lip impression in a normal resting position of the lips by dabbing it in the center first and then pressing
it uniformly towards the corners of the lips. The Glued portion of cellophane strip was pasted on the imprinted white paper for better preservation. The lip print patterns were examined by magnifying lens.

Lip prints of both upper and lower lips were divided into four quadrants, each quadrant was examined carefully and the pattern was identified according to the Suzuki classification. Lip print patterns were also compared with sex and Blood groups.

All the data was analyzed statistically using a SPSS software current version 21.0 for determining the pattern of prints in each quadrant of the lip.

**Figure 1: Lip print pattern divided into four quadrants.**

A total number of subjects are 140 in which males are 70 and females are 70. The following results were observed in our study showing that no two lip print pattern matched with each other, thus establishing the uniqueness of lip prints.

**Results**

A cross sectional analytical Study on Lip print pattern was conducted in the Telangana region among the population of the age group between 18-25 years. A total number of subjects are 140 in which males are 70 and females are 70. The following results were observed in our study showing that no two lip print pattern matched with each other, thus establishing the uniqueness of lip prints.

<table>
<thead>
<tr>
<th>Blood Group</th>
<th>Females</th>
<th>Males</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
</tr>
<tr>
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<td>10</td>
</tr>
<tr>
<td>A-ve</td>
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<td>5.7</td>
<td>2</td>
</tr>
<tr>
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<td>20</td>
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<td>1</td>
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<td>AB+ve</td>
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<tr>
<td>AB-ve</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>O+ve</td>
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<td>28</td>
</tr>
<tr>
<td>O-ve</td>
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<td>1.4</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
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<td>70</td>
</tr>
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</table>
### Table-2: Lip print pattern in Upper Left quadrant Lip both Females and Males.

<table>
<thead>
<tr>
<th>Lip Print Pattern</th>
<th>Females</th>
<th></th>
<th>Males</th>
<th></th>
<th>Total</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
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<tr>
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<td>32</td>
<td>45.7</td>
<td>40</td>
<td>57.1</td>
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<tr>
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<td>29</td>
<td>41.4</td>
<td>23</td>
<td>32.9</td>
<td>52</td>
<td>37.1</td>
</tr>
<tr>
<td>Type-3</td>
<td>9</td>
<td>12.9</td>
<td>7</td>
<td>10</td>
<td>16</td>
<td>11.4</td>
</tr>
</tbody>
</table>

### Table-3: Lip print pattern in Upper Right quadrant Lip both Females and Males.

<table>
<thead>
<tr>
<th>Lip Print Pattern</th>
<th>Females</th>
<th></th>
<th>Males</th>
<th></th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td>Type-1</td>
<td>26</td>
<td>37.1</td>
<td>26</td>
<td>37.1</td>
<td>52</td>
<td>37.1</td>
</tr>
<tr>
<td>Type-2</td>
<td>32</td>
<td>45.7</td>
<td>27</td>
<td>38.6</td>
<td>59</td>
<td>42.1</td>
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<tr>
<td>Type-3</td>
<td>11</td>
<td>15.7</td>
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<td>18.6</td>
</tr>
<tr>
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<td>1.4</td>
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<td>1.4</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>Type-6</td>
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<td>0</td>
<td>1</td>
<td>1.4</td>
<td>1</td>
<td>0.7</td>
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</tbody>
</table>

### Table-4: Lip print pattern in Lower Left quadrant of Lip both Females and Males.

<table>
<thead>
<tr>
<th>Lip Print Pattern</th>
<th>Females</th>
<th></th>
<th>Males</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td>Type-1</td>
<td>35</td>
<td>50</td>
<td>34</td>
<td>48.6</td>
<td>69</td>
<td>49.3</td>
</tr>
<tr>
<td>Type-2</td>
<td>27</td>
<td>38.6</td>
<td>21</td>
<td>30</td>
<td>48</td>
<td>34.3</td>
</tr>
<tr>
<td>Type-3</td>
<td>8</td>
<td>11.4</td>
<td>14</td>
<td>20</td>
<td>22</td>
<td>15.7</td>
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<tr>
<td>Type-5</td>
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<td>0</td>
<td>1</td>
<td>1.4</td>
<td>1</td>
<td>0.7</td>
</tr>
</tbody>
</table>

### Table-5: Lip print pattern in Lower Right quadrant Lip both Females and Males.

<table>
<thead>
<tr>
<th>Lip Print Pattern</th>
<th>Females</th>
<th></th>
<th>Males</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td>Type-1</td>
<td>39</td>
<td>55.7</td>
<td>36</td>
<td>51.4</td>
<td>75</td>
<td>53.6</td>
</tr>
<tr>
<td>Type-2</td>
<td>21</td>
<td>30</td>
<td>18</td>
<td>25.7</td>
<td>39</td>
<td>27.9</td>
</tr>
<tr>
<td>Type-3</td>
<td>10</td>
<td>14.3</td>
<td>15</td>
<td>21.4</td>
<td>25</td>
<td>17.9</td>
</tr>
<tr>
<td>Type-5</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1.4</td>
<td>1</td>
<td>0.7</td>
</tr>
</tbody>
</table>

### Table-6: Chi square test for lip print pattern in relation to the Blood groups.

<table>
<thead>
<tr>
<th>Lip Quadrant</th>
<th>Females</th>
<th></th>
<th>Males</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Value</td>
<td>DF</td>
<td>P Value</td>
<td>Value</td>
<td>DF</td>
<td>P Value</td>
</tr>
<tr>
<td>UL</td>
<td>17.975</td>
<td>10</td>
<td>0.055</td>
<td>20.182</td>
<td>12</td>
<td>0.064</td>
</tr>
<tr>
<td>UR</td>
<td>7.381</td>
<td>15</td>
<td>0.946</td>
<td>17.819</td>
<td>24</td>
<td>0.812</td>
</tr>
<tr>
<td>LL</td>
<td>8.050</td>
<td>10</td>
<td>0.624</td>
<td>13.964</td>
<td>18</td>
<td>0.731</td>
</tr>
<tr>
<td>LR</td>
<td>4.621</td>
<td>10</td>
<td>0.915</td>
<td>12.515</td>
<td>18</td>
<td>0.820</td>
</tr>
</tbody>
</table>

(Ul- Upper left, Ur – Upper right, LL- Lower left, LR – Lower right)
A Chi square test was done and it revealed a p value of more than 0.05 that was considered as insignificant. In our study there was no significant difference in the lip print patterns in both males and females and no significant correlation was observed between blood groups and lip print pattern.

Discussion

Lip prints are essential for identification of an individual and is an important tool in crime investigation similar to fingerprints and DNA analysis. Lip print impressions were obtained from both the sex with known blood groups of Telangana region and were classified by Suzuki’s classification. The lip print patterns of all the four quadrants of both upper and lower lip in relation to the sex and blood group were analyzed.

In our study it revealed that in upper left quadrant three types of patterns (Type-1, Type-2 and Type-3) were observed, among those patterns Type-1 is the most common variety in both males and females, 45.7% in Females and 57.1% in males and a total of 51.4% is observed. The second most common is Type-2 pattern observed in 41.4% of females and 32.9% of males and a total of 32.9%, followed by type-3 with, 12.9% in females and 10% in males and a total of 11.4%. The remaining lip print patterns, type 4,5,6 were not found in the upper left quadrant.

In upper right quadrant Type-2 is the predominant pattern, observed in 45.7% in females and 38.6% in males and a total of 42.1%. The next common is found to be Type-1 with 37.1% in females and 37.1% in males and a total of 37.1%, the third pattern is type-3 which is 15.7% in females and 21.4% in males and a total of 18.6%. Type-5 pattern observed in a total of 1.4% and Type-6 in 0.7%. The remaining Type-4 pattern not observed.

In the lower left quadrant, type-1 is the most common one, with 50% in female and 48.6% in male and a total of 49.3%. Type-2 is the second common pattern with 38.6% in females and 30% in males and a total of 34.3%, followed by Type-3 11.4% in female and 20% in male and a total of 15.7%. Type-5 is not found in females, whereas found in 1.4% males and a total of 0.7% is observed. The remaining patterns, Type 4 and 6 were not observed.

In the Lower Right quadrant, the commonest pattern is type-1, which is 55.7% in females, 51.4% in males and a total of 53.6%. Type-2 is observed in 30% in females and 25.7% in males and a total of 27.9%, followed by Type-3 14.3% in female and 21.4 % in male and a total of 17.9%.Type-5 is found only in males with 1.4% and a total of 0.7%. The remaining type-4 and type-6 were not found.

In all the quadrants of the lip, type-1 is the most predominant one, except in the Right Upper quadrant. The second most common is type-2 and followed by type-3. Type-5 lip print pattern observed in all the quadrants except upper left quadrant. Type-6 found in only one subject in the upper right quadrant of the Lip. Type 4 pattern was not found in our study population.

Lip print pattern in relation to the blood groups were analyzed. The most common blood group is O+ve, found in 40.7% of study population. The next common is B +ve which is 28.6% and third common one is A +ve with 15.7% as observed in our study. The blood groups in relation to the lip print patterns in all the four quadrants were analyzed with chi square test and a p value less than 0.05 is considered as significant. In our study, none of the quadrants showed a statistical correlation, except for the Upper Left Quadrant which showed a near significant value. (p value is 0.055 in females and 0.064 in males).

Several Studies conducted in India by Shaini Basheer et al7 in Kerala, Hima B. Nalluri et al8 in Telangana, Simarpreet Sandhu et al9 in Punjab, Suraj Multani et al10 in Chhattisgarh and Aman Kumar et al11 of Bihar showed similar results that Type-1 pattern is the most common pattern.

In contrary to our results some of the studies conducted in Rajasthan12, Gujarat13, Maharashtra14 and Andhra Pradesh15, revealed Branched pattern is the predominant lip pattern. In another study conducted by Devaraj et al at Karnataka16 showed Reticular Pattern is the common type. Saraswathi T R et al of Tamil Nadu1 shows Intersecting pattern is most predominant.

In relation to the blood group and lip print patterns, our study coincides with various other studies conducted by shaini basheer7 of Kerala, Rahul patel13 of Gujarat and pradhuman verma12 of Rajasthan, revealed no significant correlation.

Conclusion

A Study on lip print pattern conducted in the
Telangana population revealed that the commonest pattern is Type-1, followed by type 2 and Type 3. Several studies conducted in India also revealed similar results.

Overall, in our study, we observed that in each quadrant there was a mixture of the pattern. These patterns are unique for each individual. No particular pattern was specific to any gender and No similar lip print pattern was observed in any two subjects. Every individual has a unique lip print, thereby confirming the uniqueness of the lip print.

We did not find any significant relation between the blood groups and lip print pattern in our study, probably due to the small sample size.

Conflict of Interest: Nil

Source of Fund: Self.

Ethical Clearance: Yes.

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Comparative Study to Assess the Knowledge on Worm Infestation among Urban and Rural Mothers of School Going Children (3-12 Yrs) at Karaikal District

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Abstract

Background: Helminthes infections are more prevalent among school children aged 5-14 years. Hookworm burden is the major etiology for iron deficiency anemia in young children. One of the major health concerns especially among children is anemia and malnutrition. This risk has further complicated by lack of awareness on prevention of worm infestation among children and parents, care givers especially mothers. Increasing children’s and their Parents awareness of the problem can help to fight the disease.

Objectives: To assess the knowledge on worm infestation among urban and rural mothers of School going children.

Materials and Method: Non-experimental Comparative study was conducted to assess the knowledge among mothers in urban and rural area at Karaikal. Sample size comprised of 150 mothers of school going children were selected through non-probability or non-randomized convenience sampling. Out of 150 mothers 75 mothers from urban area and 75 mothers from rural area. The data was collected by using pretested structured knowledge questionnaire. Data was analyzed by both descriptive and inferential statistics.

Results: This study revealed that in urban area the majority of the mothers of school going children 37%(28) had adequate knowledge, 40%(30) had moderately adequate knowledge and 23%(17) had inadequate knowledge regarding worm infestation. Also revealed that in rural area the majority of the mothers of school going children 35%(26) had inadequate knowledge, 36%(27) had moderately adequate knowledge and 29%(22) had adequate knowledge regarding worm infestation. Mean and standard deviation (SD) of the urban and rural area mothers of school going children respectively 16.8±4.77, 15.01±5.16.

Conclusion: The researcher concluded that the need for more research to improve not only the knowledge also attitude and practices among mothers of school age children on worm infestations.

Keywords: Knowledge, worm infestations, Urban, Rural, Mothers of school going children.

Introduction

Children are nature’s gift and the fountain of life. They are our future and are a supremely important asset of the nation. They have to be protected and look after. By promoting their health, we will be strengthening the development of the family, Country, Nation and World.¹

Child development and wellbeing is influenced by many factors comprises the socio economic status of the family, educational level of the parents especially the mother, availability of safe drinking water and sanitary facilities and accessibility to health care services.
One of the silent and prevalent diseases in developing countries especially India is Worm infestation. It is more prevalent among school children. It can cause nutritional impairment and poor development of children. Knowledge of the worm infestation can assist in early detection of the diseases and reduce the incidence of complications.\textsuperscript{2,3,4}

In world’s population 24% or more than 1.5 billion people are infected with soil-transmitted helminth infections worldwide. Preschool-age children over 267 million and school-age children over 568 million live in areas where these parasites are intensively transmitted and are in need of interventions. Global wise over 600 million persons are estimated to be infected by 

S. stercoralis. Eggs that are attached to vegetables are ingested when the vegetables are not carefully cooked, peeled, washed in contaminated water and soil. Hookworm primarily can actively penetrate the skin when walking barefoot on the contaminated soil. Infestations causes’ loss of appetite leads to less nutritional intake affects the physical fitness, diarrea, loss of iron, protein and anemia. Health and hygiene education reduces transmission and re-infection by encouraging healthy behavior and provision of adequate sanitation. Because the main reason for infestations is poor personal and environmental sanitation. In 2018, over 676 million school-aged children were treated with anti helminthic medicines in endemic countries, corresponding to 53% of all children at risk.\textsuperscript{5}

In India, 225 million preschool(3-6yrs) and school-age (6-12 yrs) children are estimated to be at risk of worm infestations. India accounts for 65% of soil-transmitted helminth (parasitic worms) cases at South East Asia and 27% of cases world wide. In recent years, India has implemented national deworming programme, through which almost 250 million children are dewormed in February and August (twice a year).\textsuperscript{6,7}

The prevalence of anemia among the entire study population (350 children) and in those infected with worms was 56.6% and 56.9% respectively. With polyparasitism there was a relative increase in the frequency of anemia in females than males.\textsuperscript{8}

Worm infections and anemia are common in our children. Comprehensive control strategy involving good sanitation, supply of clean water and regular deworming (six month once) are recommended to prevent or reduce the prevalence.\textsuperscript{5} Multiple socio-economical, cultural, physiological and behavioral parameters along with illiteracy and poor sanitation influence intestinal parasitic infection. Awareness on infectious diseases, improving hygiene and application of supportive programs for parents to elevate socioeconomic conditions may reduce the burden of infection.

Materials and Method

The research approach adopted for the present study was Non Experimental Comparative research approach. Participants were selected by using non-probability or non randomozied convenience sampling technique. The total number of mothers of school going children included was 150(75 from urban and 75 from rural area). The study was conducted at Karaikal, Puducherry (U.T). The tools used for this study were demographic proforma and structured knowledge questionnaire. The structured knowledge questionnaire consisted of 25 items comprised of general aspects of worm infestations, types and mode of transmission, signs, symptoms, diagnosis, Treatment, prevention and complication of worm infestations.

The tool was pre-tested by administering it to sixteen mothers of school going children (8 from urban and 8 from rural area). The Participants found that the instructions and the language of the tool were simple, clear and understandable and the time taken to complete the tool was 30 minutes. The reliability of the tool was tested by split half method. A pilot study was conducted to find out the feasibility of the study. Data analysis was done by using both descriptive and inferential statistics.

Results

The study Total participants consisted of 150(75+75) mothers of school going children. Among 75 mothers from urban area about 45%(34)of mothers of school going children belonged to the age group of 31-40 years and majority 40% (30)of mothers belonged to Hindu. Maximum percentage 55% (41) of mothers had completed her degree. Most of the mothers 45% (34) were home maker. Nearly 32% (24) of the mothers had family monthly income Rs. 10001 to 20,000. Most of the mothers 36% (27) had information about worm infestations from mass media.

Among 75 mothers from rural area about 45% (34) of mothers of school going children belonged to the age group of 31-40 years and majority 48% (36) of mothers belonged to Hindu. Maximum percentage 51% (38) of
mothers had completed her degree. Most of the mothers 52% (39) were home maker. Nearly 39% (29) of the mothers had family monthly income Rs. 5000 to 10,000. Most of the mothers 48% (36) had information about worm infestations from mass media.

### Table 1. Frequency and Percentage distribution regarding knowledge on worm infestations among mothers of school going children from urban and rural area

<table>
<thead>
<tr>
<th>Level of Knowledge</th>
<th>Mothers from Urban</th>
<th>Mothers from Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>Inadequate</td>
<td>17</td>
<td>23%</td>
</tr>
<tr>
<td>Moderately Adequate</td>
<td>30</td>
<td>40%</td>
</tr>
<tr>
<td>Adequate</td>
<td>28</td>
<td>37%</td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Table 2. Mean standard deviation regarding knowledge on worm infestations among mothers of school going children from urban and rural area

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mothers from urban</td>
<td>16.8</td>
<td>±4.77</td>
</tr>
<tr>
<td>Mothers from rural</td>
<td>15.01</td>
<td>±5.16</td>
</tr>
</tbody>
</table>

The chi-square values of demographic variables such as age of the mother, religion, education, occupation, monthly family income and source of information, regarding worm infestation among mothers of school going children from urban area were not significant at P≤0.05. Thus, it is concluded that there was no association between knowledge score and selected demographic variable.

The chi-square values of demographic variables such as age of the mother, occupation, regarding worm infestation among mothers of school going children from rural area were significant at P≤0.05. Mean while there was no association with demographic variables such as religion, education, monthly family income and source of information at P≤0.05.

### Discussion

The high prevalence of parasitic infestation seems directly related to the unhygienic living conditions associated with lack of knowledge about the communicable disease and variety of allied factors, which need to be studied. Socioeconomic status and occupation of parents, the age of children and ethnicity are significantly associated with parasitic infections. Intervention measures are important to take up sustained health education, provision of safe drinking water and improvement in environmental sanitation. During the school health checkups, periodic screening for intestinal parasites and blood indices can be evaluated.

Present study revealed that in urban area the majority of the mothers of school going children 37% (28) had adequate knowledge, 40% (30) had moderately adequate knowledge and 23% (17) had inadequate knowledge regarding worm infestation. Also revealed that in rural area the majority of the mothers of school going children 35% (26) had inadequate knowledge, 36% (27) had moderately adequate knowledge and 29% (22) had adequate knowledge regarding worm infestation.

Sadhna Shinde et al conducted a community based, cross-sectional survey of 100 mothers to assessing the knowledge regarding worm infestations in selected slums in Pune and revealed that 75% of the mothers were having average knowledge, 22% of mothers had poor knowledge & only 3% of mothers were having good knowledge regarding worm infestation.

Another one study conducted by Suganya et al to evaluated the Knowledge regarding prevention of worm infestations among mothers of under five children. The result showed that among 60 samples 60 (98.4%) of mothers have inadequate knowledge and 1 (1.6%) of mothers have adequate knowledge regarding prevention of worm infestation.
One more study was conducted by Madan Mohan Gupta et al to assess the knowledge regarding worm infestation among mothers of pre-school children. The study result showed that, 48 (48%) mothers of pre-school children had moderately adequate knowledge, 42 (42%) had inadequate knowledge and 10 (10%) had adequate knowledge regarding worm infestation.13

Descriptive study had been conducted by Sharma Ankit et al on Awareness of Worm Infestation among Mothers and its Prevalence in their Preschool Children. The study results showed that 55% mothers of preschool children had average knowledge regarding worm infestation followed by 24% had good and 21% mothers had poor knowledge.14

Another one study conducted by M. Hemamalini et al regarding Knowledge on Worm Infestation among Mothers with Under Five Children 50 mothers, 18 (36%) mothers have in adequate knowledge; 20 (40%) mothers have moderately adequate knowledge and 12 (24%) mothers have adequate knowledge.15

The findings of the present study revealed that mean and standard deviation (SD) of the urban and rural mothers of school going children respectively 16.8±4.77, 15.01±5.16. Also present study concluded that there was no association between knowledge score and selected demographic variable among urban mothers of school going children. Similar study had been conducted by Rimple Sharma et al and revealed that mean knowledge score of urban mothers was higher (18.86) as compared to rural mothers (16.96) regarding worm infestation in children. It was found that there was no impact of demographic variables on knowledge score of urban mothers.16

Jebasubitha conducted study on to assess the effectiveness of structured teaching programme on knowledge regarding prevention of worm infestation among mothers of under five children. The result shows that, there is no significant association between the mean pre-test knowledge scores and the selected demographic variables such as age of the mother, education, type of family, age of the child, family income.17

Another one study provides information that most of the caregivers had a good knowledge regarding deworming but failed in practicing necessary measures to control and prevent it. Worm infestation is one of the easily preventable disease.18 Health awareness, frequent monitoring, behavior change programme and implementing interventional programs among parents and caregivers particularly among the rural population would be vital. So that the prevalence of the worm infestations can be prevented or minimized19, 20, 21

**Conclusion**

The present study concluded that most of the urban and rural mothers had moderately adequate and inadequate knowledge on worm infestations. Hence the knowledge, attitude and practice of the mothers can be enhanced through mass health education program on prevention of worm infestation which in turn promotes the growth and development of the school going children.

**Source of Funding:** Self

**Conflict of Interest:** There is no conflict of interest

**Ethical Clearance:** Informed consent was taken from the participants prior to the study.

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Eradication of Tuberculosis—
Current Status and the Way Forward

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Abstract

It is estimated that about 25% of humanity is infected with the bacterium Mycobacterium tuberculosis. That is about 2 billion people. Several new vaccines will pass Phase I clinical trials in the next few years. This paper briefly summarizes past and present challenges to developing a vaccine against tuberculosis as well as treating tuberculosis. TB is a pathogen that infects more individuals globally than any other communicable disease. TB is particularly devastating in poor developing countries, notably in Africa and Southeast Asia. Despite the WHO’s efforts to overcome TB, Multi Drug Resistant (MDR) TB and Extremely Drug Resistant (XDR) TB are huge challenges.

Keywords: TB, MDR TB, XDR TB, Tuberculosis, Multidrug Resistant Tuberculosis, Extremely Drug resistant tuberculosis, TB vaccine, TB eradication, Millennium Development Goals, MDGs.

Introduction

Global efforts are being made to eradicate tuberculosis (TB) as a public health problem by 2030. TB treatment can cause psychiatric disorders. The occurrence, prevalence and mortality rate of TB varies between countries and the paucity of accurate data makes an accurate assessment even more challenging. The psychological interactions are most common in the advanced stages of disease management and in patients with BMI ≤ 18. This necessitates continuous monitoring throughout the management.¹ Antimicrobial resistance (AMR) is a leading cause of mortality worldwide.

Bacteria mutate faster than we can develop new antibiotics. Vaccination with BCG reduces mortality rates.² BCG co-administered with DPT also reduces mortality rates.³ The evidence is overwhelming that BCG vaccines are cost compatible one and help in reducing mortality.⁴ These vaccines act as immunity enhancers and appropriate selection of drug transporters may produce a better result. Macrophages play a vital role in the development of TB granulomas and the infection process. Cell-mediated immunity acts against Mycobacterium. Macrophages are immune cells that act as a first-line defence against Mycobacterium infection.⁵,⁶

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Mycobacterium tuberculosis is capable of producing disease in any part of the human body including lungs and bone. TB acts differently on different organs, e.g., spine and lungs. Therefore, the management also varies. The need of the hour is for personalized TB management.7,8 When certain cautiously and carefully chosen medicines are given together in the right proportions, we might get synergistic bactericidal actions that kill the extremely resistant bacteria. Combination therapy is used to treat tuberculosis. Research reveals that poverty and co-infection with human immunodeficiency virus and non-communicable diseases such as cancer and candidiasis are challenges to overcome the disease.9,10 Synergistic combination treatments can be developed cheaply, used in patients safely since the constituent drugs are well known and thus could potentially be widely distributed.

WHO global TB statistics: The Millennium Development Goals (MDGs) aim for a TB free world by 2050. The WHO report on global TB 2019 says around 3.4% TB cases were MDR TB or Rifampin resistance (RR) TB. This was for the year 2018. 3 countries account for half of the world’s MDR burden. India accounts for 27% of the burden. China accounts for 14% and the Russia Federation for 9%.11 Various factors influence human health: human behavior, lifestyle modification, socioeconomic factors, political scenario, transcultural issues, and genetic factors. All of them have varying levels of significance.12 In the eradication of TB, the government must take the help of private clinicians and NGOs. Effective cooperation between the public and private sectors can drive synergies in the TB control program.

Oto toxicity, renal toxicity and hepatotoxicity can be caused by a lengthy duration of intake of medication. Toxicity and unaffordability have been identified as causes of poor outcomes.13 In the early twentieth century, socio economic changes led to a decline in TB morbidity and mortality in Western Europe and Northern America.14,15

Discussion

Current advances in Nano medicine have seen significant strategic developments in both experimental and clinical research. These successes have been made possible because of the continuous synchronization and collaboration of different disciplines: inter-professional practice (IPP). The current focus is on reducing the rate of occurrence of TB through increasing education and awareness efforts. One approach that has not been tested is the benefits of the use of more nutritious antioxidant food in the diets of TB patients. Extensive clinical trials in animals are required. Priya Rathie et al. in their research on “Patient treatment pathways of multi drug-resistant tuberculosis cases in coastal South India: Road to a drug-resistant tuberculosis center” stress that the health-seeking activities of a patient are totally influenced by the awareness of the infection, the severity of symptoms or stage of the diseases and availability of social support, especially in the form of rehabilitation. As famous futurist Michio Kaku, quantum physicist Dr. Amit Goswami and the Mahe former Vice-chancellor BM Hegde say: Precision in global health can be brought about by improved artificial intelligence and an incorporation of the concepts of quantum physics through holistic or integrated approaches which combine Genetics, Medical sociology and data sciences.

Conclusion

TB remains a major challenge in global health, despite the emergence of new infectious diseases like Nipah, H1N1, Corona etc. It means significantly effective as well as safer vaccines are required to rein in this epidemic. Effective interventions on a significant scale are especially required in TB-HIV and TB–Candidiasis co-infections. Even though the 2014 WHO report says that the mortality rate due to communicable diseases has decreased significantly, research on anti TB treatment must not cease. This, in spite of unsatisfactory, substandard, poor outcomes from various experimental and clinical trials. It is imperative on the global medical research community to find a safe and efficacious vaccine.

Ethical Clearance: Not applicable, as it is a Review of literature.

Source of Funding: Self funded.

Conflict of Interest: Nil.

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Occupational Stress among Radiographers Working in Tertiary Care Hospital in Udupi and Mangalore

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Abstract

Introduction: Occupational stress can negatively impact an individual and is associated with a wide range of physical and mental effects resulting in psychosocial and biomechanical stress. Moreover, health care workers have been reported to have a great deal of stress mainly due to the shift duties and increased workload.

Objectives: Therefore the study aimed to determine the psychosocial predictors of stress among radiographers in tertiary care hospitals of Udupi and Mangalore. Data was collected from 55 radiographers from three tertiary care hospitals using a standard questionnaire published by the UK health and safety (HSE). A score and an aggregate score was generated for each item as well as each of seven sets of working condition like “job demands, control, support from managers, support from peers, role, change and relationships”. The analysis tool published by the HSE was used to analyze data.

Results: The indicator analysis tool recommended 11 “psychosocial work conditions” that required improvement. On an aggregate level from the seven psychosocial working conditions ‘relationship’ and ‘Demand’ category warranted improvement.

Conclusion: The study showed majority categories being identified as “good and need to maintain performance”. However that main predictors of occupational stress was found to be excess workload followed by relationship conflicts among co-workers.

Keywords: Occupational stress, Radiographers, Psychosocial stress, stressors, management standards.

Introduction

Occupational stress has been recognized as an important health problem for employees worldwide. The “health and safety executive “defines occupational stress as the “adverse reaction people have to excessive pressures or other demands placed upon them”(1). The combination of high demands over the job and a low amount of control over the situation can lead to stress. Occupational stress is considered as an issue of concern as it is been associated to a variety of adverse physical and mental effects resulting in biomechanical as well psychosocial stress(2,3). Physical effects include Physical fatigue, respiratory problems, headaches, low back pain and muscular tension and impaired immune functioning(4). Mental effects include mood swings, anxiety and also socially withdrawn which results in lowered performance and productivity, obesity or weight loss and increased intake of alcohol(4). Sometimes a more severe consequence is “burnout”. Burnout is
considered a form of emotional and mental exhaustion, depersonalization and reduced sense of personal accomplishment\(^5\). Stress in workplace can have many different sources that can effect both the employer and employees involved. The factors that causes stress is called stressors. According to Health and safety executive management standards there are 6 work design stressors that if not managed well can result in a decreased productivity, poor health and wellbeing. These stressors are Demand, control, support, role, relationships and change\(^6\). Among the various health care professionals, radiographers in general are exposed to a great deal of stress where work problems, role ambiguity, role conflict and social support problems is considered the highest predictors of stress\(^6\). Occupational stress if present in the workplace should be managed for improving individual mental and physical health thus improving work efficiency and productivity for better patient care. Although numerous studies have explored work stress among health care professionals in many countries, there are few in the country that is been done on radiographers. To the best of our knowledge there is no published data on the psychosocial predictors of stress among radiographers in tertiary care hospitals. Therefore the aim of the study was to determine the psychosocial predictors of stress among radiographers in tertiary care hospitals of Udupi and Mangalore.

**Material and Method**

The study approval was acquired from Institution Research Committee and ethics committee. The sample size included 55 radiographers from 3 tertiary care hospitals of Udupi and Mangalore regions. Data was collected using a self-administered questionnaire published by health and safety executive UK\(^7\). A pre-test was conducted among 3 radiographers to know whether they were able to understand the questions. The questionnaire included thirty five questions with a 5 point Likert scale (never, seldom, sometimes, often and always). Each item was represented by an individual score with a value ranging from 1-5 with 1 being the least desirable and 5 is the most desirable. The scoring was reversed for negatively phrased question. The questionnaire included two sections. The first focused on the individual’s personal profile like subjects name, gender, years of experience and section two measured the psychosocial work conditions. The minimum and maximum score obtained on the questionnaire was considered 35 and 175 respectively. The data obtained from the questionnaire were analyzed using SPSS version 22.0. To analyze the data for possible stressors, the questionnaire responses were entered into an excel sheet analysis tool published by HSE management standards. Individual score and an aggregate score was generated for each item as well as for each of 7 sets of psychosocial working condition like “job demands, control, Manager Support, peer support, role, change and relationships”. The analysis tool also presents recommendation for action in relation to benchmark data by assigning color code. The four categories of recommendation include “red: urgent action needed”, “yellow: clear need for improvement”, “blue: good, but need for improvement” and “green: doing very well, need to maintain performance”. Descriptive analysis was done to summarize the average levels of job stress. Independent t test was used to find out any differences in stress levels between various stressors among Gender, age groups (<40 years and >40 years), work experience (<2 years and >2 years) and marital status (married and unmarried). A p value < 0.05 was considered significant when comparing the means between various groups.

**Results**

The study included 55 radiographers from 3 different tertiary care hospitals. In our study 20% of radiographers were above 40 years of age. Majority of them were males (55%), with females comprising of 45 %. Out of the 55 radiographers, 51 % of them were married. 22 out of 55 radiographers had less than 10 years of experience and 25% of them had less than 2 years of experience. The mean score for job stress among 55 radiographer was found to be 133 ranging from 105 to 163 [table 1]. The mean score of indicator items for the seven stressors is depicted in figure 1. The mean score identified below the 20\(^{th}\) percentile in comparison to the benchmark data gathered by HSE from 136 organizations was “red lighted” ‘by the analysis tool indicating “urgent action required”. None of the 7 management standards categories was found to be below the 20\(^{th}\) percentile at an aggregate level. However, scores of 3 individual items dispersed across 2 stressor category were below the 20\(^{th}\) percentile indicating urgent need of action. Scores on 3 items were yellow lighted as they were found to be between the 24\(^{th}\) and 49\(^{th}\) percentile indicating “clear need for improvement”. These items were scattered across 2 of the analysis categories. At the aggregate level, one among the seven categories (relationships) were “yellow lighted”. Scores on 5 items were found to be between the 50\(^{th}\) and the 79\(^{th}\) percentile. These items were highlighted blue with the recommendation
“good, but need for improvement” and were distributed across the ‘Demand and Control’ category. At the aggregate level, one among seven categories (demands) was observed as being in this group. Majority of the items (24) were identified as being greater than the 80th percentile and were green lighted indicating ‘doing very well, need to maintain performance’. In sum, out of 35 psychosocial working conditions examined through the indicator tool, 11 of them indicated requiring improvement when compared to benchmark data gathered from organizations in Britain.

Independent t test showed no significant difference in mean scores for all seven analysis categories between males and females. “(p = 0.38; p = 0.49; p = 0.60; p = 0.87; p = 0.12; 0.77; 0.87)”. Similarly there was no significant difference in mean score of stress levels among age groups “(p = 0.47; p = 0.91; p = 0.50; p = 0.75; p = 0.64; 0.50; 0.53)”, years of experience “(p = 0.14; p = 0.99; p = 0.38; p = 0.82; p = 0.35; p = 0.75; p = 0.23)” and marital status “(p = 0.36; p = 0.05; p = 0.24; p = 0.911; p = 0.64; p = 0.98; p = 0.78)” for all seven analysis categories.

Table 1: Mean, Standard deviation, minimum and maximum levels of job stress among Radiographers.

<table>
<thead>
<tr>
<th>No. of Radiographers</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Average</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Stress</td>
<td>55</td>
<td>105</td>
<td>163</td>
<td>133</td>
</tr>
</tbody>
</table>

Figure 1. Bar diagram showing the mean score of indicator items for seven stressor categories

Discussion

The results of the study showed that 24 out of 35 items were recognized as being greater than 80th percentile indicating ‘doing very well and need to maintain performance and the rest of 11 evaluated through indicator tool were indicated as requiring improvement when compared with “HSE s current benchmark data”. A lot of studies report excess demand, lack of social support, role conflict and managerial support as the main sources of occupational stress among radiographers(3,6,8,9). Although the present study shows that majority of the categories of psychosocial work environment is good and need to be maintained, there is a need for improvement for the demand and relationship category. Demand can be explained as those aspects of the job in a working environment that is difficult for the employee to achieve(4). These include workload, work pattern and working environment. A study conducted by Natal et al reported that accelerated work load and faulty equipment was the major cause of occupational stress. The high workload was due to high patient to staff ratio requiring more effort from radiographers to work more hard and intensively to meet the demands of staff shortage and high workload(4). The present study showed that majority (70%) of the respondents agreed that they had to work very intensively and very fast more often to
compensate for staff shortage and high workload. The relationship stressor is due to dealing with unacceptable behavior and is caused when a person is subjected to “personal harassment in the form of unkind words or behavior”. Conflict in the workplace has been recognized as a significant cause of stress for some workers\(^\text{10}\). In a survey conducted by Guest et al in 2004, 13% of participants had experienced bullying or harassment by co-workers\(^\text{11}\). The present study reported that around 44% of staff responded that they are always, often and sometimes bullied and 24% staff reported that they are always, often or sometimes subjected to “personal harassment in form of unkind words or behavior”. These recommendations provided by the indicator analysis tool are made based on benchmark data obtained from a representative number of professional groups and are not organization or sector specific. Therefore further studies can be done to develop a standardized questionnaire to evaluate the occupational stress among health care professionals. Interventions can be done for staff members to attend workshops that would help develop their skills and attitude and the effectiveness of these interventions should be assessed in response to the analysis tool recommendation. One of the limitations of the study was that there was a low response rate, as a result only few radiographers enrolled for the study. Therefore future studies can be done in a large scale to include more number of hospitals locally or regionally. Also the biomechanical stress was not evaluated in the present due to time constraints. Musculoskeletal stress is often related to excess workload which can result in psychosocial stress\(^\text{3}\). Therefore further research can be done to evaluate the biomechanical stress among radiographers. Managing occupational stress will not only improve the work efficiency but also increase the productivity which in turn will result in a better quality of care in healthcare.

**Conclusion**

The study has shown the main source of stress being excess demand followed by relationship conflicts among co-workers. Therefore it is recommended to develop interventions needed to manage psychosocial stress that may result in an improved work efficiency.

**Acknowledgement:** The authors would like to acknowledge the Institute research committee and ethics committee, Kasturba hospital for their support to undertake this study. We also extend our heartfelt gratitude to all the participating organizations for their support in data collection. We are also extremely thankful to Health and safety executive UK for providing us with the data collection tool.

**Conflict of Interest:** None

**Funding:** There no external funding for this research project as this project was conducted within the institute itself that provided us with all facilities required to conduct the project.

**Ethical Clearance:** Yes

**References**


Impact of COVID-19 on Stress in Collegiate Student

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Abstract

Background: A sudden invasion of COVID-19 globally has not only creating fatality but also leading to intolerable psychological pressure in the students as well as other groups. To cope up with this deadly situation many countries declare to be in quarantine and lockdown targeting to limit the transmission. All these situations were creating a lot of curiosity and concern in every individual. This pandemic has increased the level of anxiety and stress in the students.

Objectives: This study was aimed to assess the level of stress in students among the Indian population.

Method and Materials: For this an online survey was done using the perceived stress scale (PSS) questionnaire. A total of 475 responses were received from different universities through Google forms which were distributed to them by the various social media platforms.

Results: Out of 475 responses 58.6% were male and 41.4% were female. The stress levels identified in students were mostly moderate and high stress with 53.6% and 35.4%.

Conclusion: The students were preoccupied with the feelings of COVID-19. COVID-19 is creating various types of mental health problems initialing with stress, anxiety, distress insomnia, etc. The thoughts have become so intense that there is a need to intensify the situation. Students as well as people are in need to deal with their stress. This is a need of an hour.

Keywords: Stress, COVID-19, Corona virus, mental health, impact.

Introduction

Today the pronounced concern and threat in the universe is an invasion of Corona virus aka COVID-19. In December 2019, a public health emergency of global concern an out broke in Wuhan, China which gradually spread to many countries affecting the Mass population of the world¹.

These viruses generally transmit through human to human transmission and present with clinical manifestation of respiratory and few presents with severe cardiovascular symptoms².

This sudden widespread outbreak is connected with various psychological distresses and presents the features of mental illness³. As a result of this life-threatening condition, targets were made to restrict the transmission, early identification, spreading key information regarding awareness of the disease, preventing infection etc⁴.

To achieve the above-mentioned goals many countries implemented the state of lockdown. Although it is contributing to the global economic recession, pause in the production and services and daily routines⁵.

As COVID-19, a new contiguous disease is at its emergence and the way of spreading further creating fear, confusion, anxiety, psychological distress among the public. Lockdown situations have created unnecessary psychological pressure on the students specifically due to the unavailability of medicine and vaccine.

Since mid of March 2020, schools and colleges
were suspended nationwide. For students, such cessation means a deficit in the exploration of resources, lack of physical activity and their comfort zone. Going to school and colleges acts as a coping system with mental health issues for students. Students are getting irritated, frustrated and short-tempered on the disruption of their daily habits and routines.

Lockdown condition is creating a hostage like condition for everyone. Many students are struggling with their online classes and exams. Exams are getting cancelled and postponed in various countries. Particularly final year students are stressed about their degrees, evacuation of the dormitory, exams, job conditions in the market. The present study was aimed to assess the stress in collegiate students.

Material and Method

The present study was a cross-sectional, observational study conducted in the students from different Universities of Greater Noida, India. This was an online and self-reported study. An online Perceived Stress Scale questionnaire was developed by using Google forms. Before the questionnaire, a consent form was taken through e-mails and other social media platforms from the subject. The subjects were encouraged and demonstrated about the study after that link was sent to them. That link was auto directed to the information about the study and consent form. After accepting the survey they need to fill their demographic data and then the set of several questions appeared which was to be filled by the participants.

Perceived stress scale is a stress assessment scale which came into existence in 1983. There were 10 questions in the questionnaire. The questions were supposed to be rated on a 5 point scale ranging from never, rarely, sometimes, fairly often, very often. Score range between 0-13 is considered as low stress, 14-26 are grouped under moderate stress and 27-40 are grouped under high stress.

Descriptive statistics have been used in the study to analyze the findings. Mean, standard deviation and proportions have been used to estimate the result.

Result

The online self-reported survey was conducted in the students of different universities of Greater Noida, India. A total of 475 responses were recorded. All students were between 18-24 years of age and Indian origin. The study was limited for the student who had any type of psychological and mental disorder. The students who know the English language were included in the study.

The mean age was 22.45 ± 3.95 Years. Among the total subjects 58.6% were male and 41.4% were female. Out of total strength, (fig. 1) 53.6% (19.26±3.19) participants were moderately stressed, 10.7%(10.33±2.45) were having a low stress and rest 35.57 (33.72±3.04) were highly stressed.

<table>
<thead>
<tr>
<th>Table 1: Showing various stress level in male and female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>58.6% (279)</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Fig 1. Showing overall stress in the students due to Covid-19
Discussion

COVID-19 is considered pandemic globally and the most stressful situation for the whole human race. People of any caste, race, religion and community are facing a spectrum of challenges during this phase. Many times Lack of acknowledgment generally leads to an intolerable reaction, which may further adversely affect mental conditions. Impacts are so intensified, that they may severely affect the mental, physical and social well-being of any community. The mental state initially comes in terms of fear, anxiety, behaviour change and ultimately leads to stress.

Hence this study was attempted to assess stress in collegiate students. COVID-19 infection is a highly contagious disease and simultaneously affects a large population.

Every pandemic disease has its specific characteristics concerning causality, advancement and to control the measures. It is important to provide instruction, education and acknowledgment regarding the prevention and spreading of disease. Responses to epidemic partly depend on the mortality rate. Various studies have shown that the outbreak of many infectious diseases including severe acute respiratory syndrome (SARS) 2003 epidemic and pandemic novel influenza A (H1N1) 2009 has adversely affect mental health. Several post-traumatic stress disorder (PTSD), Psychological suffering along with anxiety and depression have been reported among populations that were exposed to mass conflict and displacement. Similar findings of high levels of psychological distress were recorded during the outbreak of the Ebola virus in Guinea and Sierra Leone in all Dominance countries.

Ginger reported that 88% of the workers are moderate to severe stress for the last 4-6 weeks. Quarantine, social distancing and separation may be leading to psychologically distressing for many people.

Our participants have not infected with COVID-19 still more students were highly and moderately stressed and they need to cope up with their stress otherwise it will further lead to many cardiovascular problems. It can be assumed that, people who are infected with COVID-19 suspected to have highly stressed and compromised mental health.

In this time of crisis it is crucial to cope with stress, anxiety, depression and other psychological disorder otherwise it may transform into severe distress leading to denial thoughts like hopelessness, dullness, failing and suicidal feelings.

Limitations this study is limited for the student who had Smartphone, e-mail IDs, internet issue and the ability to English. This study represents the data of only the educated population so it should not be generalized to the whole population.

Conclusion

COVID-19 is creating fatality, economic defoliation, psychological trauma, etc. It is clear that this pandemic has led to a vigorous and multifaceted response from students, psychiatrists and allied professionals and for that mental health issues should be taken into consideration at multiple domains and in every age group and populations. During the COVID-19 pandemic situation, students as well as people are in need to deal with their stress.

Source of Funding: None

Conflict of Interest: None

Ethical Clearance: Institutional Committee members have approved.

References


Prophecy of
Breast Cancer Recurrence Using Joint Mutual Information

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³Assistant Professor, MIET Engineering College, Trichy

Abstract

This work developed a gene appearance scheme such as pathway or protein-protein interaction details to provide improved result in forecast of melanoma sufferers. Techniques utilizing this strategy usually aggregate the appearance of genetics into new blend functions, while the additional details guide this gathering or amassing. Previous researches were limited to few details’ places with some sufferers. Moreover, each study used different details and assessment procedures. Thus, it finds to be difficult to evaluate the performance. To overcome this difficulty, introduced Mutual Information (MI). The category evaluates using the common details in a python package. The feature selection method contains a pool of normalized Affymetrix microarrays. With the advent of existing techniques, we included two efficient prognostic gene signature selection schemes for predicting the breast cancer. The performance results were proved the better results in breast density classification.

Keywords: Mammogram, Mutual Information (MI), PPI Networks, Gene Ranking, Medical images.

Introduction

Breast cancer impacts in large amount of women population and its relevant facts are referred from[1]-[34]. In early days, factors which cause breast cancer can be seen through X-Ray[8]. In Jordan, within a decade the breast cancer become the most typical melanoma. Due to this increase many females have got awareness. Between the period of 1996 to 2007, this situation has been increased from 448 to 817 situations, so 369 new situations have been recorded [2]. However, in spite of the ever-increasing cases of breast cancer over the past years, breast cancer fatal rate has decreased amongst females of every age groups[5]. Using self-check, a woman can do regular checkup in routine basis and their outcome can be considered as early invention of the illness[11].

Mammogram is found in mammography test which helps in earlier detection and analysis of breast illness[2]. In earlier days X-rays are considered as the most regularly used way of medical imaging [3]. Electronic Mammography, Computer-aided recognition and Breasts tom synthesis are the latest development in mammography[4].

Literature Survey: In malignant cases, the clinical diagnosis is best suited for treating the breast cancer. The tumor size and its patterns found in the lump are used for detecting the breast cancer. Sarvestani et al, 2010 proposed the neural systems frameworks to discover the breast Malignancy diagnosis. They examined on different neural systems techniques such as Multilayer Perceptron (MLP), Self Organizing Map (SOM), Radial Basis Function (RBF) and Probabilistic Neural Network (PNN)[23].

Abdelaal et al, 2010 studied on the Support Vector Machines (SVM)[24]. Especially, they focused on the Tree Boost and Tree Forest classifier to extract
the mammographic features based on the ages. They proved good comparable results in terms of accuracy of predicting breast cancer.

Padmavathi, 2011 performed on the comparative study on RBF and MLP using WBC dataset. The logistic regression method were used to find the rate of tumor growth. When looking at MLP and RBF neural system models, it was discovered that RBF had great prescient abilities and furthermore time taken by RBF was not as much as MLP\cite{Padmavathi}.

H. Yusuff et al, 2012 studied on analyzing the breast cancer prediction using logistic regression. The data are generated by the interviews and questionnaires. The significant values were used for the prediction of breast cancer\cite{H. Yusuff et al}. The results were obtained as 91.5% from mammograms and 67.4% of correct classification. A . Priyanga et al, 2013 has delivered a great source which is used in the early recognition of breast cancer\cite{Priyanga et al}.

Vikas Chaurasia et al, 2014 suggested data mining techniques named logistic regression systems \cite{Vikas Chaurasia et al}. They presented by RepTree, RBF network and logistic regression. A 10-fold cross validation method was used to predict the breast cancer detection at an earlier stage. The result obtained to be 74.5%.

The reviews depicted that there are many researchers studied on the breast cancer diagnosis but still there is a lack of accurate algorithms to find more accuracy to detect breast cancer.

**Research Methodology**

In the era of Medical Image Processing Segmentation has given its eternity to give fruitful results. The pictures are fragmented into a few sections in view of their Region of Interests (ROI). The part of division is to play out the assignment, for example, feature extraction and classification. This procedure is connected in breast cancer result to extract the data, for example, confining suspicious regions, producing measurable values and following of the onset and improvement of breast disease and in addition assessment of physiological structures.

**Near-skin tissues** which contains uncompressed greasy structure, situated at the edge of the breast, close to the skin-air interface where the breast is inadequately pressed.

**Fatty region** which contain oily structure that is arranged close by the uncompressed oily tissues encompassing the denser region of fibro-glandular tissue.

**Glandular regions**, which involve non-uniform breast thickness tissue with heterogeneous surface that wraps the hyper-thick area of the fibro-glandular tissue.

**Hyper-thick district**, which is symbolized by high thickness segments of the fibro-glandular tissue, which is by all accounts white tissue can be a disease.

The breast edge can be gotten by isolating the mammogram into breast and foundation areas. The extricated bosoms limit ought to successfully outlined the skin-air interface and ensure the breast area in picture. Then again, skin-line area in mammograms where the breast decreases is regularly low in dark level differentiation. It is caused by the absence of standard pressure of the breast, close to the breast limit area. This effect decreases the deceivability along the fringe district of the mammogram and makes it hard to protect the breast skin-line and to recognize the breast range position.

Breast thickness is an estimation of the thick structure of fibro-glandular tissue, which is by all accounts white on a mammogram. Fibro-glandular tissues seem to have circle or cone designs and extend through the interior of the breast. In light of the thickness level, the breast tissue is ordered.

**Experimental Study:** To present an existing work in a efficient manner large number of images and their detailed descriptions are needed. Datasets such as MIAS (Mammographic Image Analysis Society Digital Mammogram Database) and DDSM (Digital Database for Screening Mammography) are the well-known datasets which are used in mammography to find out the existence of the breast cancer. These data sets were extracted from freely available repositories. Information’s contained here are focuses on superior of images and on wide range of cases. To find out the exactness of images concepts of edge detection algorithms were used. After finding exactness of disease classification algorithms were applied. Implementation is done using MATLAB code. The graphical user interface was designed to provide the outmost user ambiance and ease of use. In GUI, the image is chosen and the intrinsic properties of the image such as running aspect, bandwidth threshold, initial index and the initial row of the image is assisted to predict the breast cancer. The steps involved in mammogram is depicted in Fig. 1.
MRI of the breast: Magnetic Resonance Imaging is the most appealing contrasting option to Mammography. MRI is sensitive for identifying a few growths which could be missed by mammography. To be effective, contrast upgraded breast MRI is done by infusing in the patient’s body of a paramagnetic complexity specialist.

This strategy depends on the speculation that, after the infusion of the operator, variations from the norm upgrade more than ordinary tissues because of their expanded vascularity, vascular piousness’ and interstitial spaces MRI shapes 3D uncompressed picture. It can perform with all ladies including who are not reasonable for mammography, for example, young ladies with thick breast and ladies with silicone-filled breast implants. Since it utilizes magnetic fields, MRI has no destructive consequences for human bodies. Be that as it may, MRI sets aside rather long opportunity to perform and has high cost which is more than ten times more noteworthy than mammography.

Support vector machine: Support vector machines (SVMs) are an arrangement of Supervised learning techniques that examine information and perceive designs, utilized for characterization and regression investigation. All the more formally, SVM builds a hyper plane or set of hyper planes in a high or unbounded dimensional space, which can be utilized for classification, regression or different errands. Instinctively, a great detachment is accomplished by the hyper plane that has the biggest separation to the closest preparing information purposes of any class, since by and large the bigger the edge the lower the speculation error of the classifier.

The fundamental thought of SVM is that it anticipates information focuses from a given two-class preparing set in a higher dimensional space and finds an ideal hyper plane. The optimal one is the one that isolates the information with the maximal edge. SVMs recognize the information focuses close to the ideal isolating hyper plane which is called support vectors. The distance between the isolating hyper plane and the closest of the positive and negative information focuses is known as the margin of the SVM classifier.

4.3 Database

Total quantities of 412 examples are acquired from mammograms containing small scale calcifications from MIAS. From the collected data based on the principle of classification concepts, partitioned the 80% samples into training data set and 20% of the samples are described as testing set. The training set contains 340 specimens, of which, 3155 normal, benign and malignant cases. Remaining 70 tests are utilized for testing SVM classifier. Testing set contains 15 instances of normal and 15 instances of abnormal respectively and results are displayed in Fig.2-4.
In pattern recognition systems, Fuzzy C-means algorithm is the most often used techniques. Fuzzy C-mean is also known as Fuzzy ISODATA. A group of data may be belonging to one or more cluster is known as Fuzzy C-Means (FCM) which is described to lessen the minimization problem to accomplish a well-known classification system.
The working of Fuzzy C-means is given as:

(a) Determine the matrix as \( U = [u_{ij}] \) and \( U^{(0)} \).

(b) Estimating the cluster centers in vector format as \( C^{(k)} = [C_j] \) with \( U^{(k)} \).

(c) Updating the \( U^{(k)} \) and \( U^{(k+1)} \) as

\[
U_j = \frac{1}{\sum_{i=1}^{c} \frac{\| x_i - c_j \|}{\| x_i - c_j \|}}
\]

If \( \| U_j^{k+1} - U_j^k \| <|\epsilon| \) is met, then the function is terminated or else follows the step (b).

### Parameter Selection and Training:

Since this work has been concentrate more on classification of miniaturized scale calcification into benign or malignant, the ordinary case won’t be utilized. Each of benign and malignant cases has a metadata that demonstrated the area and size of the small-scale calcification. This work proposed the classification of computerized mammogram utilizing Fuzzy and SVM classifier. The quantities of training and testing sets are appeared in “Table 1”. “Table 2” demonstrates the classification rate for normal and abnormal categories and the simulation results for tumor severities of small-scale calcification (benign and malign).

<table>
<thead>
<tr>
<th>Table 1. Number of Training and Testing Sets</th>
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<tbody>
<tr>
<td><strong>Category</strong></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Normal</td>
</tr>
<tr>
<td>Abnormal</td>
</tr>
<tr>
<td>Benign</td>
</tr>
<tr>
<td>Malignant</td>
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<table>
<thead>
<tr>
<th>Table 2. Classification Rate – SVM, FCM, Proposed</th>
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<tbody>
<tr>
<td><strong>Category</strong></td>
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<tr>
<td></td>
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<tr>
<td>----------------</td>
</tr>
<tr>
<td>Normal</td>
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<tr>
<td>Abnormal</td>
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<tr>
<td>Benign</td>
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<tr>
<td>Malignant</td>
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</table>

Table 1 lists the number of training and testing data sets taken with basic classification concepts for the stages such as Normal, Abnormal, Benign, Malignant. Table 2 shows the classification. Table 2 shows the Classification rate of Proposed technique with the existing techniques such as Support Vector Machine and FCM. From the results it is clearly understood that Proposed technique has shown better performance comparing with existing technique like Support Vector Machine and Fuzzy C Means Clustering Algorithms.

### Conclusion

The glandular tissue is the most recommended part for estimating the density of the breast tissue. The classification is based on the density level to suspect the breast cancer. The glandular tissue visualized the affected region. The anatomical regions are segmented and classified which exposed the affected part to the radiologist to interpret the results. The breast density estimation is classified accurately in order to predict the breast cancer at an earlier stage. The performance results proved that the breast density classification yields better results. It is clearly seen that proposed work has given better performance. As a future work, the segmentation is merged with the glandular tissue in screening mammography.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Yes
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Pattern of Poisoning Cases at Tertiary Care Center at Geetanjali Medical College & Hospital, Udaipur

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Abstract

\textbf{Introduction}: Poisoning is a global public health problem causing significant morbidity and mortality. It is important to know the pattern and outcome of acute poisoning cases for proper planning, prevention and management of these cases.

\textbf{Aims and Objective}: To find out the pattern of poisoning reported in Geetanjali Medical College, Udaipur.

\textbf{Material and Methodology}: The present prospective study had been conducted in the Department of Forensic Medicine, Geetanjali Medical College & Hospital, Udaipur, Rajasthan during the period of Two year from 1\textsuperscript{st} Jan 2017 to 31\textsuperscript{th} Dec 2018.

\textbf{Result and Observation}: In our study majority of poisoning case [101 cases (35.69%)] were observed in the age group of 21-30 years followed by the age group of 11-20 years. Male person [153 cases (54.06%)] most commonly affected by poison and majority of patients [184 cases (65.02%)] belongs to Rural area. In our study majority numbers of cases [128 cases (43.82%)] found in rainy season. In our study higher number of poisoning cases were due to Aluminium phosphide poisoning [106 cases (37.47%)] followed by snakebite poisoning [62 cases (21.91 %)]. Among insecticides, maximum 40 cases (14.13 %) were due to Organophosphorus compounds. \textbf{Conclusion}: Awareness and education about the potential toxicity of commonly used pesticides and drugs may help in reducing the burden of poisoning.

\textbf{Keyword}: Prospective study, Poison, Aluminium Phosphide, Snake bite, Organophosphorus, Udaipur.

Introduction

Poisoning is a global public health problem causing significant morbidity and mortality. It is important to know the pattern and outcome of acute poisoning cases for proper planning, prevention and management of these cases.

Mortality and morbidity of poisoning cases varies from country to country depending on the nature of poison and availability of facilities and treatment by qualified doctors\textsuperscript{1}.

Poisoning is a medical emergency and a patient is always invariably rushed to the hospital at the earliest possible moment, irrespective of the amount and nature of poison ingested\textsuperscript{2}.

Poisoning is one of the major causes of hospitalization through emergency and is a major public health problem\textsuperscript{3}. Pattern of poisoning in a region depends on variety of factors, such as availability of the poisons, socio-economic status of the population, religious and cultural influences and availability of drugs.

Considering the cost and outcomes of the poison cases reported to the hospitals, it is found necessary
to establish a Poison Information Centre (PIC) which should be networked with other poison information centres in India and with other countries, by which identifying the poisons and managing the cases will become more efficient.

**Aims and Objective:**

To find out the pattern of poisoning reported to the hospital.

To determine the age and sex wise distribution of poisoning cases.

To find out the duration of hospital stay.

To find out nature and type of Poison.

**Material and Methodology**

The present prospective study had been conducted in the Department of Forensic Medicine & Toxicology at Geetanjali Medical College & Hospital, Udaipur, Rajasthan during the period from 1st Jan 2017 to 31st Dec 2018.

The diagnosis of poisoning was based on history given by clinical examination, police officer, patient relatives and medical case papers. Necessary laboratory tests were also performed to confirm the diagnosis of poisoning (if available). All cases of poisoning admitted to the hospital were included in this study. The data including demographic profile of patients, duration of hospital stay, nature and class of poison, outcome and circumstances of poisoning were obtained from medical records and were documented on a pre-structured proforma.

**Result and Observation**

In our study majority of case [101 cases (35.69%)] were observed in the age group of 21-30 years followed by the age group of 11-20 years [65 cases (22.26%)] followed by 31-40 years[46 cases (16.25%)]. While only 5 case (01.77%) was observed in between 61-70 years age group. [Table 1].

Majority [153 cases (54.06%)] of cases of Poison were Male person while [130 cases (45.94%)] were female. [Table 2]

In our study majority of cases [184 cases (65.02%)] belongs to Rural area, while 99 cases (34.98%) belongs to Urban area. [Table 3]

In our study majority numbers cases [128 cases (43.82%)] of Poison found in rainy season [Table 4].

The hospitalization time for the poisoning cases in our study, varied between 1-37 days with a mean duration of hospitalization of 4 -7 days. [Table 5].

In our study Out of total 283 poison cases, Aluminium phosphide poisoning were found in 106 cases (37.47%) followed by snakebite poisoning was there in 62 cases (21.91 %) and acid poisoning - 3 cases (1.06 %).Among insecticides, maximum - 40 cases (14.13 %) were due to the organophosphorus compounds. [Table 6].

**Discussion**

In the present study, majority of Poisoning cases (21.30%) were observed in the age group of 21-30 years. which was also similar with various studies, like Gupta P et al5, Bari M S Vet al6. This shows that young adults are more vulnerable to this health problem which might be due to emotional and social disharmony, occupational problems and risk taking behaviors at these ages.

The pattern of poisoning with respect to gender in our study indicates that there were more cases of poisoning among the male patients(54.06%) compared to female patients(45.94%).This type of similar finding are observed by Gupta Pet al5, Bari M S V et al6. High proportion of poisoning among males might be due to change in the lifestyle and cultural patterns, reactive depression and high degree of stress in academic, financial and social sectors.

In the present study, majority of victims (65.02%) were belongs to rural area, while 34.98 % victims were belongs to urban area. Nearly similar finding are seen in the study done by Sharma BR et al7. This maybe because widespread use of pesticide in agriculture sector in rural area. Poverty, failure of crops, family problems and easy availability of the poison in their household made people of rural area more prone for poisoning. However, study done by Abubakar S etal8 from state of Karnataka, the incidence was more in those who were from urban background.

A season-wise variation was seen in the poisoning incidence in the present study. Maximum numbers of poisoning cases [128 cases (43.82%)] were seen in the rainy season . This may be due to increased work and labour pressure, financial crisis and increased use and availability of pesticides, Insecticide during that season. Also snake bite cases more seen in this season.
The hospitalization time for the poisoning cases in our study, varied between 1-37 days with 30.74% showing a mean duration of hospitalization of 4-7 days. A similar result was found in the study conducted by Abubakar S et al\(^8\) in southern India, which indicated that the average number of days of hospitalization was 4-7 days (33.3%).

The Southern parts of Rajasthan, mostly comprising of agricultural land, the geographic distribution of the Victims chiefly being from rural areas and comprising of 184 cases. In our study most of cases of poisoning were due to Aluminium phosphide, Snake bite and Organophosphate poison. Because of abundant use of pesticides, Insecticides in agricultural fields of rural areas and inhabitation of poisonous reptiles (snakebite) in unhealthy and hilly rural areas, Organophosphate and aluminium phosphide are common agents used for poisoning because of low cost and easy availability and since majority of patients in our study were from rural background and were farmers, they used these pesticides instead of other poisons. Snake bite is also common in our study because of predominance of people of rural area.

**Table 1: Age Wise Distribution of Poisoning Cases**

<table>
<thead>
<tr>
<th>Age group</th>
<th>No. of Patient</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>25</td>
<td>8.83</td>
</tr>
<tr>
<td>11-20</td>
<td>63</td>
<td>22.26</td>
</tr>
<tr>
<td>21-30</td>
<td>101</td>
<td>35.69</td>
</tr>
<tr>
<td>31-40</td>
<td>46</td>
<td>16.25</td>
</tr>
<tr>
<td>41-50</td>
<td>21</td>
<td>7.42</td>
</tr>
<tr>
<td>51-60</td>
<td>22</td>
<td>7.77</td>
</tr>
<tr>
<td>61-70</td>
<td>5</td>
<td>1.77</td>
</tr>
<tr>
<td>71-80</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>283</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table 2: Sex Wise Distribution of Poisoning Cases.**

<table>
<thead>
<tr>
<th>Gender</th>
<th>No. of Patient</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>153</td>
<td>54.06</td>
</tr>
<tr>
<td>Female</td>
<td>130</td>
<td>45.94</td>
</tr>
<tr>
<td>Total</td>
<td>283</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table 3: Locality Wise Distribution of Poisoning Cases**

<table>
<thead>
<tr>
<th>Locality</th>
<th>No. of Patient</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>99</td>
<td>34.98</td>
</tr>
<tr>
<td>Rural</td>
<td>184</td>
<td>65.02</td>
</tr>
<tr>
<td>Total</td>
<td>283</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table 4: Season Wise Distribution of Poisoning Cases.**

<table>
<thead>
<tr>
<th>Season</th>
<th>No. of Patient</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter</td>
<td>68</td>
<td>24.02</td>
</tr>
<tr>
<td>Summer</td>
<td>91</td>
<td>32.16</td>
</tr>
<tr>
<td>Rainy</td>
<td>124</td>
<td>43.82</td>
</tr>
<tr>
<td>Total</td>
<td>283</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table 5: Duration of Hospital Stay Wise Distribution of Poisoning Cases.**

<table>
<thead>
<tr>
<th>No. of days of hospitalization</th>
<th>No. of Patient</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 1 day</td>
<td>76</td>
<td>26.86</td>
</tr>
<tr>
<td>1-3 day</td>
<td>83</td>
<td>29.33</td>
</tr>
<tr>
<td>4-7 day</td>
<td>87</td>
<td>30.74</td>
</tr>
<tr>
<td>8-15 day</td>
<td>25</td>
<td>8.83</td>
</tr>
<tr>
<td>16-30 day</td>
<td>11</td>
<td>3.89</td>
</tr>
<tr>
<td>Above 30 day</td>
<td>1</td>
<td>0.35</td>
</tr>
<tr>
<td>Total</td>
<td>283</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table 6: Type and Nature Poison Wise Distribution Of Poisoning Cases.**

<table>
<thead>
<tr>
<th>Type of Poison</th>
<th>No. of Patient</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium Phosphide</td>
<td>106</td>
<td>37.46</td>
</tr>
<tr>
<td>Snake bite</td>
<td>62</td>
<td>21.91</td>
</tr>
<tr>
<td>Scorpion Venom &amp; Other Arthropods</td>
<td>24</td>
<td>8.48</td>
</tr>
<tr>
<td>Organo Phosphorus</td>
<td>40</td>
<td>14.13</td>
</tr>
<tr>
<td>Insecticide Other than O.P.</td>
<td>12</td>
<td>4.24</td>
</tr>
<tr>
<td>Corrosive Poison</td>
<td>3</td>
<td>1.06</td>
</tr>
<tr>
<td>Miscellaneous Poison</td>
<td>13</td>
<td>4.59</td>
</tr>
<tr>
<td>Psychotropic drug</td>
<td>4</td>
<td>1.41</td>
</tr>
<tr>
<td>Alcohol</td>
<td>4</td>
<td>1.41</td>
</tr>
<tr>
<td>Unknown</td>
<td>15</td>
<td>5.30</td>
</tr>
<tr>
<td>Total</td>
<td>283</td>
<td>100</td>
</tr>
</tbody>
</table>
Conclusion

Most common type of poisoning cases reported overall was aluminium phosphide followed by snake bite followed by organophosphate. Proportion of mortality and requirement of ventilator was higher in case of aluminium phosphide poisoning. We suggest the government should regulate the import, manufacture, sale, transport, distribution and use of insecticides and pesticides. Upgrading the peripheral health centres to manage cases of poisoning in emergency including training of staff to give first aid treatment of poisoning (including timely intubation and respiratory support on AMBU bag) and availability of antidote and anti-snake venoms and increase in public awareness about the seriousness of problem through health education.

Awareness and education about the potential toxicity of commonly used pesticides and drugs may help in reducing the burden of poisoning. We should have to establish a poison information centre (PIC) which should be networked with other poison information centre in India and with developed countries which can help in identifying the poison and managing the cases.

Source of Funding: Self

Conflict of Interest: Nil

Acknowledgement: Nil

Ethical Clearance: It is taken from Ethical committee of Geetanjali Medical University, Udaipur.

Reference

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Integration and Synchronization of Population Policies Through Grand Design Population Development in Indonesia

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Abstract

The problem of population in Indonesia is complex. Population policy in the era of decentralization is still not integrated and sustainable. Grand Design of Population Development is a guideline for population-oriented policies, strategies and development programs, which contains important current population issues, desired population conditions, population development programs, population development roadmaps covering population quantity control, quality development population, family development, spatial planning and population regulation and population administration development. Approach Grand Design of Population Development can influencing policy and responsive policy towards population dynamics. With the Grand Design of Population Development, a region can prepare itself to welcome the demographic bonus that can be done through improving human quality. Human development as an effort to develop capability the ability of human self, which contains four elements, namely productivity, equity, sustainability and empowerment. The roadmap set out in Grand Design of Population Development will be implemented on an ongoing basis to improve human quality, reflected in the increasing Human Development Index.

Keywords: Population policies, grand design population development.

Introduction

People is the object and subject of development (people centered development). To reach a development goal is determined by the human development, economy, culture and national character. Development oriented to the potential and needs of social, economic, cultural, physical and spiritual tranquility of the people. A large population will become a force for national development if it is accompanied by a qualified and competitive population, because a high-quality population will accelerate the achievement of economic and social growth(1).

Some of the regulations that form the basis of the drafting of a Grand Design for Population Development (GDPD) are as follows: 1.) Indonesian’s Law Constitution of 1945 (Preamble, Article 28B, article 33 and article 34); 2.) Law Number 24 of 2013 concerning Population Administration; 3.) Law No. 39 of 1999 concerning Human Rights; 4.) Government Regulation Number 87 of 2014 concerning Development of Population and Family Development, Family Planning and Family Information Systems; 5.) Presidential Regulation 153 of 2014 concerning GDPD(2).

The population in an area in a particular year is influenced by birth, death and migration (3). Births that occur will be incremental while deaths will be a deduction from the population. Likewise with migration, the number of people come is supplementary and the people left is reduced(4).

In line with regional autonomy, a population development effort that is consistent and sustainable is the most appropriate choice amid complex population

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Based on these problems, the researcher raised the research topic with the title “Grand Design of Population Development in improving the quality of human development in Indonesia”

**Problem Formulation:** The total population in the world reached seven billion and is expected to nine billion by 2035. More than three-quarters of the world’s population live in developing countries, one of which is Indonesia with a population of more than 237 million people in the year 2010 with a population growth rate of 1.3% per year (3).

Projection shows that population of Indonesia will keep increasing in the next twenty five years from, 238.5 million in 2010 to 305.6 million in 2035. However, In the period of 2010-2015 and 2030-2035 the population growth rate will decrease from 1.38 percent to 0.62 percent per year. This decrease is determined by a decrease of the birth and death rates. The decrease rate caused by birth is faster than that caused by death. The Crude Birth Rate (CBR) will decrease from approximately 21.0 for 1000 population in the beginning of the projection to 14.0 per 1000 population in the end of the projection period. Meanwhile the Crude Dead Rate (CDR) will increase from 6.4 per 1000 population to 8.8 per 1000 population in the same period of time (6).

In the same period of time, the productive ages, 15-64 years, increase from 66.5 percent to 67.9 percent and those of 65 years and above increase from 5.0 percent to 10.6 percent. This change in age composition decreased the dependency ratio from 50.5 percent in 2010 to 47.3 percent in 2035. Then the decrease in the dependency ratio means a decrease of economic burden to the population in productive ages which has always been supporting the unproductive age population (6).

Indonesia Gold in 2045 is a condition in Indonesia is superior, advanced to compete with other nations in the world in 2045 (7). In that year Indonesia also must be moved out of the zone Middle Income Trap which can be achieved if carried out policy reforms focused on increasing the significant economic growth and strengthening of human resource capacity (1).

**Literatures:**

**People Centered Development:** Malthus says “If there are no restrictions on population will multiply very quickly and fulfill some parts of the earth’s quickly. Humans need food for life but rate of growth of food is much slower” (8). Population projection is a scientific calculation based on assumptions of the components of the population growth rate, namely birth, death and movement (12).

Development as a effort or a series for growth and change that are planned and carried out consciously by a nation, state and government, towards modernity in the context of nation building (13). Development is a process of change all social systems, such as politics, economy, infrastructure, defense, education and technology, institutions and culture (14). Development as an economic, social and cultural transformation (15).

Development in this article is defined as a form of change that is planned; each person or group of people certainly hope have a better shape or even perfect than the previous situation; to realize this hope certainly require a plan. Development planning is felt more as a more rational and orderly effort for the development of undeveloped or newly developing societies (16).

According to Heran is a useful change towards sustainable social and economic systems which are decided as the will of a nation (17). Development is a process that moves in a straight line, namely from backward society to developed country society. Development was first used in the sense of economic growth. A community is considered successful in carrying out development, if the economic growth of the community is quite high (18).

**Problem Solution:** Development is a process of transformation of the community from a situation to another situation that is closer to the ideals of the community, though two things to consider, continuity and change. Development is a process of change that occurs naturally as a result of development (14). Thus, the development process occurs in all aspects of community life, economic, social, cultural, political, which takes place at the macro (national) and micro (community/group) level (3).

This paradigm gives the role of the individual as a subject, the actor who sets goals, controls resources and directs the processes that affect his life. According to this paradigm, the main goal of development is to create an environment that allows its people to enjoy a creative, healthy and long-life. All development policies must be carried out based on the principle of people centered development in order to achieve population-oriented development.
Quality of the population is the condition of the population in physical and non-physical aspects which include the degree of health, education, employment, productivity, social level, resilience, independence, intelligence, as a basic measure to develop abilities and enjoy life as human beings who are pious, cultured, have personality, nationally and live well.

**Funding:**

**Grand Design of Population Development (GDPD):** Regional development is carried out through the development of regional autonomy and the regulation of resources that provide opportunities for the realization of good governance. Mandated by Law 23 of 2014, one of the affairs of population control is to guide and synchronize population control policies. One product of the integration and synchronization of population policy is the GDPD document which can be used as guidance on population-oriented policies, strategies and development programs. According to Presidential Regulation 153 of 2014 concerning the GDPD, it is stated that GDPD is a formulation of population development planning for the next 25 years and is elaborated every five years which contains important issues of current population, population conditions desirable, population development program, population development roadmap which includes population quantity control, population quality development, family development, spatial distribution and population regulation and population administration development.

Grand Design of Population Development can be used as a guide for stakeholders in local governments in integrating population policies, targets and programs into Regional Mid-Term Development Plan (RPJMD) document, both influencing policies and responsive policies on population dynamics in the regions. Especially, GDPD can accelerate development and can integrate the population development program.

**Discussion**

**Policy And Strategy Fill In Demographic Deviden By GDPD:** In 2020 and 2030 Indonesia will receive Demographic Deviden. the success in exploiting the demographic bonus is affected by the government’s readiness to prepare a qualified workforce. Furthermore, the government has a very important role to manage the resource potential of Indonesia.

A country have a demographic deviden if the population of productive age (15-64 years) more than the not-productive age (0-14 years and 65 years and above). The comparison between the two population groups is called the Dependency Ratio. The economic benefit due to the decrease in the Dependency Ratio is called the Demographic Deviden. The decline in the dependency ratio at some point will reach its lowest point and turn back up again, when it shows the lowest number which is usually under 50%, called The Window of Opportunity where the opportunity is very short only occurs once in a decade of the entire life journey population.

A country or region is said to have a demographic bonus if the dependency ratio is below 50.0 percent. A demographic deviden is an opportunity for a country’s economic prosperity because of the large proportion of the productive population. If this opportunity is not utilized to its full potential, it will be an anti demographic (bomb disaster) bonus.

With the GDPD, an area can prepare itself to welcome demographic deviden that can be done through improving the quality of public health, especially the health of the productive age population so that during the elderly boom, the aging population will not be a problem (especially the problem of funds swelling health insurance), improving the quality of education and developing skills, controlling population growth rates and supporting economic policies.

**Strategies that can be taken by the government in picking demographic deviden include:**

**Improving the quality of adolescent:** The development of a prosperous family will provide educational platforms for future generations, especially adolescents who will soon enter the productive age. Encourage the creation of quality families so that it is expected to produce a quality generation, especially for adolescents in the family, restore family functions so that they can help the development process of adolescents who are full of dynamics, provide a forum or event that provides opportunities for adolescents to appreciate their talents and abilities, incorporate life learning skills into the school curriculum so that graduates can be ready to use, maximizing the GenRe Program in schools, colleges and the surrounding environment through advocacy and IEC, increasing awareness and participation of governments and stakeholders in making pro-youth policies.

**Improving the quality of education:** Decreasing
the number of children born gives flexibility to improve family quality. All expenditures can be more focused on education and health to improve the quality of competitive human resources. Improving the quality of the population of productive age can be done by providing skills that are in accordance with the needs of the labor market with competitive quality. Preparation and utilization of demographic deviden one of which includes the expansion of universal secondary education and strengthening the linkages of vocational and industrial education and training.

**Placing elderly people as a asset, not a burden:**
Being in the era of demographic deviden and their continuation in the future, the increase in the elderly population in the future can be used as a potential rather than a burden. Older people with health problems and declining productivity can be a burden. But with the improvement of the quality of existing health, the elderly population is expected to continue to be able to produce. To get a productive elderly population, population-based development programs are needed and the programs are long-term.

**Improving a Health Program:** Development programs in health sector that prepare a healthy population, not easily sick, so that those who later enter old age will still be healthy. With good health, they can still be productive in economic activities. While preparing healthy people, but the state must also protect them with health insurance. In addition, from the community’s point of view, there must be a continuing awareness program to save money or participate in a pension fund program that can be relied upon when retirement has arrived.

The strategies are as follows: Increasing access and quality of primary level health services, Improving Access and Quality of Referral Health Services, Healthy Living Community Movement Program and Family Approach

**Economic Empowerment:** With the Demographic Bonus a Window of Opportunity through birth is prevented. This fact will increase significantly towards increasing family opportunities for productive activities. Productive activities will lead to an increase in community welfare, namely: 1) increasing women’s motivation to enter the labor market, 2) increasing women’s participation, 3) saving society and 4) human capital (human capital) available.

**Importance of GDPD on Human Quality Development:** Human development as an effort to develop the ability of human self, which contains four elements, namely productivity, equity, sustainability and empowerment. Quality human development that has been achieved by an area can be done by measuring the quality of development using Human Development Index (HDI) which include 3 parameters: 1) Success in health, by looking at life expectancy, 2) The ability to reflect on the success of educational development by looking at old expectations school and length of school, 3) The amount of goods and services that can be provided by the community to its citizens is by looking at the purchasing power parity of the community.

![Figure 1. Contribution of GDPD in HDI](image)
Meanwhile GDPD is a formulation of population development planning which includes five aspects, namely population quantity control, population quality development, family development, spatial planning and population regulation and population administration development. The five aspects of GDPD are very closely related to efforts to develop human quality through its deciding components. If a regency/municipality has compiled GDPD properly according to the stipulated provisions, then in fact the efforts of the regency/city in the development of human quality are already on the correct roadmap. The direction of development policies and programs in GDPD has been made, medium term and long term. The flow of importance of GDPD in Human Quality Development can be described as follows:

**Conclusion**

Some recommendations from the grand design of population:

Utilization of GDPD in the roadmap for the development of human quality and sustainable development, because most of the population programs contained in GDPD are promoting human development and sustainability.

Integration, Synchronization and Synergy of GDPD programs and roadmaps relating to human quality development and sustainable development.

Strengthened networking of policies and programs among stakeholders in building population governance to support the creation of sustainable development.

It must be realized from the start that population development through quantity control efforts is a long-term investment and the results will be felt in the future.

**Conflict of Interest:** The authors have no conflict of interest with the material presented in this paper

**Sources of Funding:** None

**Ethical Clearance:** None. My paper is an idea and policy analysis to solve population problems

**References**


Facial Reconstruction: Solving Mysteries and Rewriting Histories

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\textsuperscript{1}Professor and Head, \textsuperscript{2}Professor, \textsuperscript{3}Reader, \textsuperscript{4}PG Student, Dept. of Oral medicine and Radiology

Abstract

Facial reconstruction is a multidisciplinary field that holds the ability to identify a missing person from the scratch. It comes into play when all other techniques fail. Over the years, the journey of facial reconstruction has taken many noteworthy turns and has emerged as a triumph. There have been several attempts from two dimensional techniques which utilize the soft tissue depth to the more recent three dimensional technology in reconstructing the facial features on the skull. From crime cases to the distress caused by natural disasters, facial reconstruction solves it all.

Keywords: Facial Reconstruction, Manual Processing, Three dimensional printing.

Introduction

“The real face is not behind the mask, it is actually with the mask”; and facial reconstruction is the science as well as art that fabricates the veil which beholds the identity of a person. Faces are fascinating with intriguing histories and with the help of forensic advancements, these can be unraveled to crack crimes and help find families their loved ones.

Facial reconstruction is mainly used in two principal branches of science: forensic science and archaeology. Skulls are indestructible for centuries and thus are being utilized for years to teach anatomy lessons and more recently have been identified as a major means to discover a person’s identity.\textsuperscript{2}

The face of an individual has several different types of exclusive features and thus, is of great importance in identification and recognition of a person. Forensic facial reconstruction is an alternative method in the identification process where there is little or no other evidence available.\textsuperscript{3}

Hence, in this collaborative review of literature, we have outlined the history, the process, the manual and advanced methodologies and number of commercially available soft wares for facial reconstruction.

The Historical Outline: The history has witnessed, a multitude of different traditions to deal with the dead. Among the various rituals, the first evidence that the skull was used for remembering the dead dates from the Neolithic Age \textsuperscript{4}. Similarly, there are multiple examples from the past depicting how special consideration was given to the head or skull.

Few years later, death masks came into existence and in the Italian Renaissance period, death-mask art was most appreciated. Artists from northern Italy were the first to provide wax models for doctors and surgeons.

Nineteenth century marked the beginning of crime detection and in 1895, a German anatomist, Wilhelm His did the first facial reconstruction. He reconstructed the face of German composer Johann Sebastian Bach. Another breakthrough came with the advent of “Welcker Facial Reconstruction Technique” by a Welcker, a Germanphysiologist and anatomist. He utilized the average soft tissue depths to construct the mask over the dried skull.\textsuperscript{1}
In 1946, Wilton Maria Krogmann, brought modifications in the existing method by documenting five basic principles of reconstruction of soft tissues of the face i.e. the relation of eyeball to orbit, the shape of nose tip, the ear location, the mouth width and the ear length.

Forensic facial reconstruction took a quantum leap in the 1980s, when Computerized reconstruction was first studied at London College University. Here, at the university, the pioneers carried out a cranial reconstruction procedure using a laser like scanner and video camera.

**The Process:** The main focus of facial reconstruction is to reinstate the characteristics and features to the details of the dried skull. The creation of the face from the skull is a procedure of approximation.

The traditional facial reconstruction method are based on manual procedures, producing 2D portraits or 3D sculptures.

**These method basically consists of three steps:**

- Creating a replica of the raw skull with a sparse set of anatomical landmarks
- apply an average soft tissue thickness to each skull landmark in order to estimate a corresponding landmark on the face
- draw up or sculpt a face fitting the estimated landmarks.

The process of facial reconstruction demands a multidisciplinary approach, where forensic artists, archaeologists, medical team, all team up to reconstruct a person’s identity. Finally a qualitative comparison is made between facial reconstructions of a real-case skull, based on two typical static face models.

However, one reconstruction might take several days to months. In order to alleviate these difficulties, several computer graphic software packages have been developed. These advancements utilize the same basic procedure of manual processing, which permits to take advantage of both human expertise and the precision of softwares. The main aim of forensic facial approximations is to promote recognition of a deceased person and all the processes and methodologies are designed to achieve an accurate forensic facial approximation (FFA).

**The Methodologies**

Methodologies of facial reconstruction involves:

- Two Dimensional Reconstruction
- 3D Manual Reconstruction
- Three dimensional printing for facial reconstruction

**Two-dimensional reconstruction:** In 1980s, Karen Taylor in Austin, Texas developed the construction of face engaging the soft tissue depth estimates. Two dimensional reconstruction focuses on this principle and brings into role the antemortem photographs of an individual.

Moreover, these days certain software programmes like CARESTM or CARES (Computer Assisted Recovery Enhancement System) and FACES (Forensic Anthropology Computer Enhancement System) etc quickly produce 2D reconstruction which can be edited and manipulated. These softwares work by digitization radiographs, photographs which will replicate an electronically altered version of the image.

**3D Manual Reconstruction:** This method also needs both an artist and a forensic anthropologist. This method is similar to two dimensional method as it also requires the use of tissue depth markers of specified lengths to represent different soft tissue depths. The markers are inserted into small holes on the skull cast at specific strategic points or landmarks. In the computerized method, computer software produces reconstruction by using scanned and stock photographs.

**Legends:** Here is a diagramatic presentation of the model generation using three dimensional and CT scans and processing them in the software: (diagram 1).
Three dimensional printing for facial reconstruction: This method of facial reconstruction is efficient, accurate and noninvasive to the remains, whether it is used for forensics or archaeological purposes. Reconstruction can be processed through Abode Photoshop for final rendering.

Conclusion

Forensic facial reconstruction provides a noninvasive and relatively simple approach to identify a missing person. This is one of the most crucial gateways to solve crime scenes as well as help families find their lost ones. This technique is not only used for identification of individuals from skeletal remains but is also used for archaeological research purposes. Moreover, with the advent of three-dimensional technologies, the whole process has become relatively quick and simpler, opening new gates to this amazing field.

Ethical Clearance: Approved from the ethical committee.

Source of Funding: Nil

Conflict of Interest: None declared

Source of a Support: Nil

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Cheiloscopy–An Efficient Method for Gender Dimorphism

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Abstract

Lip print is an anatomical character of the human lips. In forensic identification, lip print patterns can lead us to important information and helps in person’s identification. The grooves present on human lips (Sulci labiorum) are unique to each person and can be used to determine identity. Fingerprints, post-mortem reports and of late, DNA fingerprinting, have been successful in person identification in the field of forensic science. Just as in these method, lip prints can be instrumental in identifying a person positively and can be used to verify the presence or absence of a person at the scene of crime. Cheiloscopic techniques have an equal value in relation to other types of forensic evidences for personal identification.

Material and Method: The study was conducted on 100 students of age group 18-25 yrs. Lip stick was applied on each individual and the lip-print was obtained on a paper. The lip impression patterns were studied, classified and recorded using magnifying lens with light.

Result: Lip patterns are unique for the individual and no two patterns are identical to each other. In study population, Type III pattern was most common in male while In females predominant pattern was type I. Thus in medico legal case, due to clear differentiation in sexes it is easy to identify person and gender.

Conclusion: Cheiloscopy can be reliable method for personal identification and gender dimorphism.

Keywords: Lip prints, cheiloscopy, personal identification, sex determination

Introduction

In the field of forensic science, it is important to verify the presence or absence of a person at the scene of crime and to establish person’s individuality for legally as well as humanitarian purpose. For identifying it is also essential to determine the gender of an individual¹.

Various well known implanted method of person identification like fingerprints, anthropology, odontology, DNA analysis, iris scan, post mortem findings and other techniques that determine gender, approximate age, height, etc., have been successfully used. Just as in these method, lip prints can be instrumental in identifying a person positively. It is least invasive and cost effective procedure among all²³⁴.

Lip print is an anatomical character of the human lips. “It is defined as the normal lines and fissures present in the form of wrinkles and grooves that are located in the transition zone of the human lip, between the inner labial mucosa and the outer skin, the examination of which is referred as cheiloscopy⁵⁶.

Lip prints are not affected by injuries, environmental changes and diseases. The grooves present on human lips (Sulci Labiorum) are unique to each person. As lip prints remain unchanged throughout the life, based on their characteristic arrangements cheiloscopic techniques have an equal value in relation to other types of forensic evidences for personal identification⁷⁸.

For identification purpose, lip print left in crime scene can be used as the evidence to compare with that of the suspect. Cheiloscopy as a tool for identification was

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first recommended as early as 1932 by Edmond Locard (1877-1966), one of France’s greatest criminologists\(^9\).

By 1950, in textbook on homicide cheiloscopy was described as a method of identification\(^10\). In 1967, Santos classified and divided lip groove into four types for the first time namely\(^11,12\).

1. Straight line
2. Curved line
3. Angled line
4. Sine-shaped curve

Suzuki and Tsuchihashi, in 1970, devised a classification method of lip prints, which follows\(^13,14\). (Figure 1, 2).

1. Type I: A clear-cut groove running vertically across the lip.
2. Type I’: Partial-length groove of Type I.
3. Type II: A Branched groove.
4. Type III: An intersected groove.
5. Type IV: A Reticular pattern
6. Type V: Other patterns.

**Figure 1: Various lip print patterns**

In literature, these are most widely used classifications. For discrimination of the sex of an individual, Vahanwahal and Parekh (2000); Sivpathasundaram, et al. (2001) gave coding as Type I, I’, II patterns are dominant in females and Type III, IV, V are dominant in males\(^15,16\).

Researchers suggested that lip prints are suitable for comparison, analysis and identification of a person\(^17,18\). The present study is undertaken with aim to study the predominant type of lip patterns in study population and to correlate it for identification of gender.

**Material and Method**

A cross sectional descriptive study was conducted in department of Forensic medicine after approval of institutional ethical committee.

The purpose of the study was briefed to all the
participants and written informed consent was obtained from each of the participants.

The study was conducted on 100 students from 2nd MBBS at MGM’s Medical College Aurangabad. Male and female students of age group 18-25 who were willing to participate, whose lips were free from any pathology, had normal transition zone between the mucosa and skin included in study group. Those having gross deformities of lip (cleft lip, ulcers, scar, trauma, inflammation, lesions) heavy smokers, allergy to lipstick were excluded from study.

A dark colored frosted lipstick, thin bond paper, a magnifying lens, cellophane tape, pen/pencil were required as a study material.

The lips were cleaned and a thin layer of red/brown colored lipstick was applied on the lips. he person was asked to rub both the lips to spread the applied lipstick evenly A sheet of bond paper was folded and the “hinged” portion of the paper was inserted in between the lips and subjects were asked to press their lips onto it. It was then “unfolded” again. The cellophane tape was pasted on bond paper to preserve the record. The lip prints were coded according to name and sex of an individual.

A horizontal line dividing upper lip from lower lip and a median vertical line dividing lips into two halves was drawn. Thus, lip prints were divided in first right upper, second left upper, third left lower and fourth right lower quadrants for identification of a person. The number of lines and furrows, their length, branching and combinations in each quadrant were noted using magnifying lens in light. Analysis of lip patterns was done based on the classification system given by Suzuki and Tsuchihashi in 1970\textsuperscript{13}.

For determination of sex middle 10 mm of lower lip was selected due to numerically supremacy and clear visibility of the lines\textsuperscript{15,19}. Most common pattern of lip prints in male and female was determined, also similarity of lip prints between two impressions was studied.

Statistical analysis was done using statistical package for social science (SPSS). Ver16. The frequency of each type of lip print was tabulated and the percentage of each type was calculated. For gender identification the data was analyzed with Chi-square test using Yate’s correction and a $P$-value less than 0.05 was considered as significant. Analysis of all the lip prints was done by two observers independently and evaluation of data was done to eliminate any subjective bias.

**Findings:** The study was conducted on 100 subjects including 50 males and 50 females. In each subject, lip print pattern was different in all four quadrants also multiple patterns were observed in each single quadrant. Hence we can conclude that no two lip prints are identical to each other and are unique for the individual. This can help in identification of an individuals as well as the gender.

Most common lip patterns in total study population, in males and females were determined, presented in Table 1 and graphically represented in Figure 3,4. In males predominant pattern was Type III, followed by type IV. Type I’, V, II, I followed next. In females predominant pattern was type I, followed by type I’ and type II. Type III, IV, V followed next.

Identification of sex was correctly possible in 43 males and 45 females, while there was error in correct reporting of gender in 07 males and 05 females. Thus in medico legal case, due to clear differentiation in sexes it is easy to identify person and gender. (Table-2).

<table>
<thead>
<tr>
<th>Table 1: Lip print pattern distribution in male and females</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of lip print</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td>I’</td>
</tr>
<tr>
<td>II</td>
</tr>
<tr>
<td>III</td>
</tr>
<tr>
<td>IV</td>
</tr>
<tr>
<td>V</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
Figure 3: Bar diagram of Lip print pattern distribution in male and females

Figure 4: Pie diagram showing type of Lip pattern in study population

Table 2: Gender identification from type of lip prints in study population

<table>
<thead>
<tr>
<th>Study population</th>
<th>Correct diagnosis of gender</th>
<th>Wrong diagnosis of gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>45</td>
<td>02</td>
</tr>
<tr>
<td>Females</td>
<td>45</td>
<td>05</td>
</tr>
<tr>
<td>Total</td>
<td>88</td>
<td>12</td>
</tr>
</tbody>
</table>

\[ r^2 = 0.345, P > 0.05 \]

Discussion

“Identity” is a set of physical characteristics, functional or psychic, normal or pathological- that define an individual.
Identification of individuality of a human is a prerequisite for personal, social and legal reasons and to certify death. Classification of unidentified body or a trace into groups of age, sex, race, height narrows the possibilities for identification. More the unique characteristics, smaller is the group of comparison.

Lip prints are recognizable from the 6th week of fetal life. They are not affected by environmental changes, pathologies, minor trauma and inflammation. When lips are impressed onto variety of surfaces (like photographs, glass, papers, windows cutlery, cigarette) the visible morphology and patterns produced by them are important tool for identification of a person. Due to the specific pattern of grooves and wrinkles in lips, cheiloscopy has become an important antemortem identification procedure and a source of circumstantial evidence. It can conclude the character of the event, number and sex of person involved, cosmetics used, habits, occupational trails and pathology present in lip itself.

This study was carried out to study the predominant type of lip patterns in study population and for identification of gender from it. In all subjects no two patterns were identical, this finding correlate with the study of Tsuchihashi and Suzuki et al. This proves the uniqueness of lip patterns. We have excluded subjects having cleft lip, ulcers, scar, trauma, inflammation, lesions as these can be the identification mark themselves. In our study, we found Type III and Type IV lip prints commonly seen in males and Type I, I’ and II commonly seen among females. This is in agreement with study by Sharma BS et al. from this it can be concluded that cheiloscopy can be a mean for identification and gender estimation with good accuracy and reproducibility. Post mortem changes in lip pattern from cadaver should also be taken into consideration as studied by Utsuno et al.

Conclusion

Cheiloscopy plays important role in establishing identity of an individual. Among various methods such as finger prints, DNA analysis, Iris scan, anthropology, dental records, cheiloscopy is cost effective, non invasive and reliable method of personal identification. From our study and available literature we can conclude that cheiloscopy can be reliable method for identification.

Lip prints are accepted as identification mark in some places, it needs further studies with advanced procedures in large population of different races, family members, twins and siblings. There is need of development of standard procedure for collection, development, study, documentation and comparison of individual detail of lip prints so that data base of lip prints of individuals located in geographical area can be created.

Conflict of Interest: None declared

Source of Funding: Self

Ethical Clearance: This Opic is approved by Ethics Committee for research of Human Projects, MGM’ medical college, Aurangabad.

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The Role of Peer Support in HIV Testing among Risk Groups with Social Influence and Communication Competency Approaches (Study in Tulungagung Regency, Indonesia)

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Abstract

Patients with HIV/AIDS in Indonesia are increasing rapidly, especially in Tulungagung Regency, this requires serious treatment to prevent an epidemic that continues to spread. The research was aimed at optimizing the role of peer support in HIV testing in at-risk groups. The study was conducted descriptively observational. The sample was a risk group consisting of FSW and MSM as many as 72 people. The results of the study showed that 73% of the risk groups that had the effect of peer support had already taken an HIV test. The most influential form of social influence on risk groups of 44.44% was conformity, which is the behavior of the following habits in groups. In addition to the influence of peer support the communication competencies of peer support also affect risk groups. 69.7% of the risk groups that received peer support motivation had tested for HIV. A good level of peer support knowledge could affect 86.4% of the risk groups for testing. Good peer support skills could influence 85.7% of risk groups to take an HIV test. It could be concluded that knowledge from risk groups is related to attitudes and intentions to carry out HIV testing. Risk groups that have good intentions, carry out HIV testing. Communication competency consists of motivation, knowledge and skills related to HIV testing. Social influence was related to HIV testing. The form of social influence most felt by risk groups was conformity, then compliance and the least perceived is obedience.

Keywords: Peer support, risk groups, social influence, communication competency.

Introduction

The case of HIV-AIDS is a health problem that is a serious problem for the community. This case is growing rapidly in the world and the rapid spread of HIV in various countries is becoming a big problem. The UN through the Millennium Development Goals program includes HIV-AIDS as a focus for countries to be taken seriously. The spread of HIV-AIDS is not merely a health problem but has political, economic, social, ethical, religious and legal implications and even has a real, immediate, or slow impact, touching almost all aspects of human life ¹. This threatens the nation’s efforts to improve the quality of human resources. In the UNAIDS declaration, the goal of controlling HIV AIDS is Getting Three Zeroes (Zero New Infection, Zero AIDS-related death, Zero Stigma and Discrimination)²–⁴.

In general, counseling and testing are the main strategies in the prevention and management of HIV cases. Until 2006, global policies undertaken for HIV surveillance were with Client-Initiated Voluntary Counseling and Testing (VCT) carried out inside and outside the Health Services Unit. According to WHO, HIV testing services have the principle of “5C” namely informed consent, counseling, confidentiality, correct

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test results and connection to care treatment and prevention services.\textsuperscript{5–7}

East Java is one of the provinces which has quite a high number of HIV-ADS sufferers and occupies the top position in Indonesia. The number of HIV cases in East Java in 2019 was 8,934. In Tulungagung District the number of HIV-AIDS cases from year to year showed an increase. As is the case with the iceberg, there are likely to be many unsolved cases. This is the duty of all parties to be able to find cases as early as possible to prevent further spread.

In 2019 in Tulungagung Regency the population groups at risk were 19,093 people who were willing to take an HIV test of 12,758 people. National targets 90\% of risk groups know their status. Risk groups are groups that are at risk for HIV-AIDS and have the potential to transmit HIV-AIDS.\textsuperscript{8} Included in this risk group are pregnant women, TB patients, female sex workers (FSW), MSM, transsexuals, IDUs and inmates.

In Tulungagung Regency, to invite at-risk populations to want to conduct an examination carried out in collaboration with various parties both from the Health Office, AIDS Eradication Commission and also the role of peer support. Peer support is a group of people infected with HIV to get together and support each other because they have the same fate. Peer support began to be formed in 2006. The formation of peer support in the Tulungagung Regency aims to encourage at-risk populations to want to check HIV so that they know their status while helping people living with HIV to live better quality. This peer support consists of people who care about the spread of HIV-AIDS cases who then join to form a group known as peer support groups. The members of this peer group consisting of people living with HIV-AIDS (PLWHA) who have the determination to overcome the spread of HIV-AIDS. They consist of MSM (Gay), transsexuals and FSW groups.

The number of peer support members in Tulungagung is around 30 people consisting of 19 women and 11 men. The existence of peer support is very helpful in inviting risk groups to conduct examinations because they have access and high emotional closeness with risk groups. Included in this risk group are pregnant women, FSW, TB patients, MSM, transsexuals people, IDUs and prison prisoners. Peer support groups (PSG) in Tulungagung reach MSM, transsexuals people and FSW by\textsuperscript{9,10}. While other risk groups, already under the Health Center target. The health center also reaches MSM, transsexuals people and FSW, but they still need the existence of peer support because they are the link. Without peer support, it will be difficult to reach this community. This is where the importance of the role of PSG.

The results of previous research on the role of PSG stated that several factors influence peer support in the HIV-AIDS response system at both the provincial and district levels.\textsuperscript{11} The study mentioned that the factors that influence peer support are divided into 2 namely internal and external factors. As for what is included in internal factors are group motivation, leadership, independence and management and group accountability. Whereas included in the external group are involved in the HIV-AIDS control system, access to resources and entry into the referral system.

Other research also states that with the support of peer support, the quality of life of PLWHA is increasing (Pebrianti, 2018). With this support, PLWHA can live, as usual, be able to socialize, be independent, be productive and have a quality of life. Therefore the role of peer support is very important in the HIV-AIDS response system both in early discovery and in providing support to PLWHA.

In addition to the two studies above, there is also research that states that PSG is the right place for PLWHA to share information, support and motivate each other.\textsuperscript{13,14} Because PSG is formed from the ODHA element itself, the existence of PSG is easily accepted. In some areas there is still no access to health services and information about HIV-AIDS, so this is an important role for peer support.

To enhance the role of peer support in engaging these risk groups, it can be learned using communication competency theory and social influence. This theory states that in motivating people to want to change attitudes, beliefs, perceptions and behavior, efforts need to influence and communicate well. Research is aimed at optimizing the role of peer support in HIV testing in at-risk groups.

**Materials and Method**

The study was conducted with an observational descriptive approach with cross sectional research design. The study was conducted in Tulungagung Regency, Indonesia in February-March 2020. The sample in this study was a risk group consisting of 72 FSW and MSM.
**Findings:** Communication competence which includes motivation, knowledge and skills, all three have a significant relationship with HIV testing in risk groups. The results of the analysis can be seen in the following Table 1.

**Table 1. Relationship of Peer Support Motivation and HIV Testing in Tulungagung Regency, Indonesia, 2020**

<table>
<thead>
<tr>
<th>No.</th>
<th>Peer Support Motivation</th>
<th>HIV testing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Not tested yet</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Less</td>
<td>11</td>
<td>91.7</td>
</tr>
<tr>
<td>2</td>
<td>Enough</td>
<td>15</td>
<td>55.6</td>
</tr>
<tr>
<td>3</td>
<td>Good</td>
<td>10</td>
<td>30.3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>36</td>
<td>50</td>
</tr>
</tbody>
</table>

Based on the Spearman correlation test it is known that sig (2-tailed) is 0.001 and the Correlation Coefficient is 0.425. It can be concluded that there is a relationship between motivation from peer support and HIV testing in risk groups. Based on Table 1 it can be seen that the motivation of the lack of peer support, 91.7% of risk groups have not tested for HIV. While good peer support motivation, 69.7% of risk groups have tested for HIV. The better the motivation of the risk groups, the more risk groups will get HIV testing.

These results are consistent with research from Anggipita which states that there is a significant relationship between motivation from peer support and PLWHA compliance to take ARVs. Research from Handayani and Mardiati\textsuperscript{11} also states that motivation from peer support can influence members to support each other and carry out positive activities.

**Table 2. Relationship of Peer Support Knowledge with HIV Testing in Tulungagung Regency, Indonesia, 2020**

<table>
<thead>
<tr>
<th>No</th>
<th>Peer Support Knowledge</th>
<th>HIV testing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Not tested yet</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Less</td>
<td>17</td>
<td>85</td>
</tr>
<tr>
<td>2</td>
<td>Enough</td>
<td>16</td>
<td>53.3</td>
</tr>
<tr>
<td>3</td>
<td>Good</td>
<td>3</td>
<td>13.6</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>36</td>
<td>50</td>
</tr>
</tbody>
</table>

Based on the Spearman correlation test it is known that sig (2-tailed) is 0.001 and the Correlation Coefficient is 0.546. This shows that there is a relationship between the level of peer support knowledge and HIV testing in risk groups. Based on Table 2 it can be seen that with a good level of peer support knowledge, 86.4% of the risk groups have tested. While with a lack of peer support knowledge, 85% of the risk groups have not tested for HIV.

This is in line with research conducted by Pratiwi and Rosida\textsuperscript{15} which states that good knowledge about HIV/AIDS and there is support and care if the results are positive will cause a person to seek VCT service facilities. Respondents who know about HIV and VCT will influence the person to find out their HIV status so he uses the available VCT service facilities.

Based on the Spearman correlation test it is
known that \( \text{sig (2-tailed)} = 0.005 \) and the Correlation Coefficient is 0.342. This can be interpreted that there is a relationship between peer support skills and HIV testing in risk groups. From Table 3 above it can be seen that with good peer support skills, 85.7% of the risk groups have tested for HIV. While the lack of peer support skills, as many as 65.2% of risk groups have not tested for HIV.

<table>
<thead>
<tr>
<th>No</th>
<th>Peer Support Skills</th>
<th>HIV testing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Not tested yet</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Less</td>
<td>15</td>
<td>65.2</td>
</tr>
<tr>
<td>2</td>
<td>Enough</td>
<td>19</td>
<td>54.3</td>
</tr>
<tr>
<td>3</td>
<td>Good</td>
<td>2</td>
<td>14.3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>36</td>
<td>50</td>
</tr>
</tbody>
</table>

Table 3. Relationship of Peer Support Skills and HIV Testing in Tulungagung Regency, Indonesia, 2020

Based on the analysis of each component of communication competency with HIV testing in the above risk groups, there was a significant correlation. So communication competency from peer support can influence risk groups to carry out HIV testing. Social influence is an effort made by peer support to change the attitudes, beliefs, perceptions, or behavior of risk groups. There are 3 forms of social influence, namely conformity, compliance, and obedience. The results of the study note that there is a strong relationship between social influence with HIV testing as shown in Table 4.

<table>
<thead>
<tr>
<th>No</th>
<th>Social Influence</th>
<th>HIV testing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Not tested yet</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>No</td>
<td>26</td>
<td>74.3</td>
</tr>
<tr>
<td>2</td>
<td>Yes</td>
<td>10</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>36</td>
<td>50</td>
</tr>
</tbody>
</table>

Table 4. Relationship between Social Influence and HIV Testing in Tulungagung Regency, Indonesia, 2020

Based on statistical tests it is known that asymptomatic \( \text{sig (2-sided)} = 0.001 \) and Contingency Coefficient is 0.427. This can be interpreted that there is a relationship between social influence with HIV testing in risk groups.

Risk groups that were influenced by peer support as much as 73% had already tested for HIV. Whereas the risk group that did not get the influence from peer support, amounted to 74.3% had not tested for HIV and only 25.7% had tested for HIV. Risk groups that are influenced by peer support are 7.8 times more likely to take an HIV test. The results of the study also state that the form of social influence most felt by risk groups is conformity, as shown in the following table.

<table>
<thead>
<tr>
<th>No.</th>
<th>Social Influence Form</th>
<th>Total</th>
<th>%</th>
<th>% cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Conformity</td>
<td>32</td>
<td>44.44</td>
<td>44.44</td>
</tr>
<tr>
<td>2</td>
<td>Compliance</td>
<td>31</td>
<td>43.06</td>
<td>87.5</td>
</tr>
<tr>
<td>3</td>
<td>Obedience</td>
<td>9</td>
<td>12.5</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>72</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 5. Identification of the Social Influence Form in Tulungagung Regency, Indonesia, 2020
Based on Table 5 it can be seen that the form of social influence that is felt by the most risk groups is conformity at 44.44% then compliance at 43.06%. The form of obedience is only 12.5% of risk groups who feel it. This is in line with research by Hanindya Sucita Putri\textsuperscript{16} which states that there is a positive and significant relationship between conformity with peers and consumptive behavior in class X (ten) and XI (eleven) students. Research from Ayu Rahmadhita Apsari\textsuperscript{17} states that there is a positive relationship between conformity and premarital sexual behavior in adolescents. Another study conducted by Slamet Andi Priyatmoko\textsuperscript{18} also mentioned that there was a significant relationship between social influence and the decision to buy something.

**Conclusions**

Based on the results of the study it can be concluded that: Communication Competency which consists of 3 components namely motivation, knowledge and skills have a positive relationship with HIV testing. The better the motivation of the risk groups, the more risk groups will get HIV testing. The better the level of peer support knowledge, the easier it will be to provide information to at-risk groups so that they can influence them to test for HIV. With good skills, peer support can set an example and can be trusted by risk groups.

Social Influence carried out by peer support in at-risk groups was very influential in that more people had tested for HIV. The form of social influence that is given peer support and is felt by many at-risk groups is conformity, which is behavior following the habits that exist in the community. A persuasive approach by peer support has proven to be able to invite risk groups to take an HIV test.

**Acknowledgments:** The author would like to thank Universitas Airlangga, which has allowed completing this final project.

**Source of Funding:** Self-funding

**Conflict of Interests:** Nil

**Ethical Clearance:** The study has passed the ethical test from the Ethics Commission of the Faculty of Nursing, Universitas Airlangga (EC Number: 1935-KEPK). The respondents’ identities have all been deleted from the dataset. Respondents have provided written approval for their involvement in the study.

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**References**

14. Blanchard AK, Nair SG, Bruce SG, Ramanaik


Ten Year Autopsy Study of Differentiating Features Between Hanging and Strangulation

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Abstract

Introduction: Hanging is that form of asphyxia which is caused by the suspension of the body by a ligature which encircles the neck, the constricting force being the weight of the body, or part of body weight. Strangulation is a form of death caused by constricting the neck by some means other than body weight. The means used may be ligature (ligature strangulation), human hand (throttling or manual strangulation), elbow (mugging), or some hard subject such as stick (bansdola).

Aims and Objectives: To study the differentiating aspect between Hanging and Strangulation, with respect to type of ligature material and its position, external and internal finding of neck and changes in the subcutaneous tissue of neck.

Results: Hanging amounted for 50.37% cases while strangulation was 17.20% cases among the violent asphyxial deaths. Clothes (65.45%) were most common ligature material both in hanging and strangulation as well. Position of ligature was above the level of thyroid in 95.12% cases while in strangulation the position of ligature was at level of thyroid in most of the cases (45.71%). Associated injuries are present in 51.43% cases of strangulation. Subcutaneous tissue is white glistening in most of hanging cases (76.58%) while contused in most of strangulation (82.86%) cases.

Conclusion and Suggestions: It is suggested that in the interest of justice to avoid confusion, in all cases of violent asphyxial deaths, the post-mortem examination should be conducted by the Forensic experts only. Police personal should also be given training that they should not cut the ligature material and remove ligature material before post-mortem examination so that easy differentiation of hanging and strangulation can be made.

Keywords: Hanging, Strangulation, ligature material, violent asphyxial deaths, internal neck findings.

Introduction

Hanging is that form of asphyxia which is caused by the suspension of the body by a ligature which encircles the neck, the constricting force being the weight of the body, or part of body weight.

Hanging is classified on the basis of:

(A) Degree of suspension, 1. Complete hanging: The body is completely suspended without any part of the body touching the ground. 2. Partial hanging: The body is partially suspended, the toes or feet touching the ground, or in sitting, kneeling, lying down, prone, or any posture with only head and chest off the ground.

(B) Position of the knot 1. Typical hanging: Knot is present over the central part over the back of the neck. 2. Atypical hanging: The knot is anywhere other than on the occiput, i.e., on the right or left side or front of the neck.

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The “mark of hanging” on the victim depends upon various factors like height of suspension point, nature and composition of the ligature material used, the weight of the body, duration of the suspension, things which intervene between the ligature material and skin of the neck. It requires an expert’s skill and care for the determination of cause and manner of death. Multiple rounds of ligature around the neck with two or more fixed knots calls special care in interpretation to decide the cause and manner of death, other injuries over the neck and bodily injuries could complicate the matter.2

The level at which the ligature mark lies is also of importance in making the distinction between hanging and strangulation by a ligature. Strangulation is a form of death caused by constricting the neck by some means other than body weight. The cause of death in hanging and strangulation is mainly due to asphyxia. Still, it may be due to venous congestion, cerebral ischemia, shock, or a combination of more than two causes. Fracture-dislocation of cervical vertebrae occurs in judicial hanging. Postmortem appearances vary according to mode of death. There are external and internal appearances. External appearances are due to ligature on the neck and those peculiar to the mode of death. The ligature mark on the neck varies according to the nature of the material used as a ligature, which requires a detail inspection. In complete hanging, the ligature mark is usually situated above thyroid cartilage between larynx and chin. It is directed obliquely upward along the line of the mandible (lower jaw) and reaches the mastoid process behind the ear. It is sometimes absent at the back where two limbs of noose stretch upward toward the knot. The mark may be found on or below the thyroid cartilage, especially in case of partial suspension. It may also be circular. In the case of strangulation by ligature, the mark is well defined and usually situated low down in the neck below the thyroid cartilages and encircling the neck horizontally and completely. The marks are multiple if ligature is twisted several times around the neck. It may be oblique as in hanging if the victim has been dragged by ligature or strangled in recumbent position.3

**Aims and Objectives:** The present study was carried out with a view to study the incidence and to study the differentiating aspect between Hanging and Strangulation, with respect to type of ligature material and its position, external and internal finding of neck and changes in the subcutaneous tissue of neck.

**Material and Method**

Data has been collected from autopsies conducted on dead bodies of cases of violent asphyxial deaths at the mortuary of department of Forensic Medicine and Toxicology, Govt. Medical College, Amritsar, during period of last 10 years from 1st January 2006 to 31st December 2015.

407 cases of violent asphyxial deaths has been studied using pre-tested structured schedule, all cases of violent asphyxial deaths brought to department of Forensic Medicine and Toxicology, Government Medical College, Amritsar, mortuary for autopsy and those who fulfill the inclusion and exclusion criteria had been selected on a purposive sampling basis.

**Inclusion Criteria:** Autopsy on all cases of violent asphyxial deaths conducted at mortuary of department of Forensic Medicine and Toxicology, Govt. Medical College, Amritsar during a period of ten years.

**Exclusion Criteria:**
1. All deaths due to violence other than asphyxial death.
2. Deaths due to chemical asphyxiants.
3. Deaths due to poisoning.
4. Sudden natural deaths.
5. Deaths due to cold, starvation, heat and anaphylaxis.

**Observations:**

| Table 1: Incidence of violent asphyxial deaths based on method of asphyxiation |
|---------------------------------|----------|------|
| Type of Asphyxial death         | No. of cases | %    |
| Hanging                         | 205       | 50.37|
| Strangulation                   | 70        | 17.20|
| Throttling                      | 5         | 1.23 |
| Traumatic asphyxia              | 3         | 0.74 |
| Suffocation                     | 4         | 0.98 |
| Drowning                        | 120       | 29.48|
| **Total**                       | **407**   | **100.0**|
### Table 2: Type of ligature material used in hanging and strangulation

| Ligature Material | Hanging | | | | | | Strangulation | | | | | | Total | | |
| | Male | Female | | | | | Male | Female | | | | | | No. | % | No. | % | | | No. | % | | | No. | % | | | No. | % |
| Wire | 3 | 1.46 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 3 | 1.09 |
| Rope | 49 | 23.90 | 20 | 9.76 | 10 | 14.29 | 10 | 14.29 | 89 | 32.36 |
| String | 1 | 0.49 | 0 | 0.00 | 1 | 1.42 | 1 | 1.42 | 3 | 1.09 |
| Clothes | 86 | 41.95 | 46 | 22.44 | 18 | 25.71 | 30 | 42.86 | 180 | 65.45 |
| Total | 139 | 67.80 | 66 | 32.20 | 29 | 41.43 | 41 | 58.57 | 275 | 100.00 |

### Table 3: Position of ligature mark in hanging and strangulation

| Position of ligature mark | Hanging | | | | | | Strangulation | | | | | | Total | | |
| | No. | % | No. | % | No. | % | No. | % |
| Above the thyroid cartilage | 195 | 95.12 | 11 | 15.71 | 206 | 74.91 |
| Below the thyroid cartilage | 1 | 0.49 | 27 | 38.57 | 28 | 10.18 |
| At the level of thyroid cartilage | 9 | 4.39 | 32 | 45.71 | 41 | 14.91 |
| Total | 205 | 100.00 | 70 | 100.00 | 275 | 100.00 |

### Table 4: External findings of neck in case of hanging and strangulation

| Details of ligature mark | Hanging | | | | | | Strangulation | | | | | | Total (n=275) | | |
| | No. | % | No. | % | No. | % | No. | % |
| Number | Single | 204 | 99.51 | 65 | 92.86 | 269 | 97.82 |
| | Multiple | 1 | 0.49 | 5 | 7.14 | 6 | 2.18 |
| Direction | Oblique | 202 | 98.54 | 9 | 12.86 | 211 | 76.73 |
| | Horizontal | 3 | 1.46 | 61 | 87.14 | 64 | 23.27 |
| Ligature mark | Complete | 1 | 0.49 | 19 | 27.14 | 20 | 7.27 |
| | Partial | 204 | 99.51 | 51 | 72.86 | 255 | 92.73 |
| Associated injuries | Present | 19 | 9.27 | 34 | 48.57 | 53 | 19.27 |
| | Absent | 186 | 90.73 | 36 | 51.43 | 222 | 80.73 |
| Ecchymosis at edges | Present | 78 | 38.05 | 38 | 54.29 | 116 | 42.18 |
| | Absent | 127 | 61.95 | 32 | 45.71 | 159 | 57.82 |
| Foreign body/material | Present | 11 | 5.37 | 5 | 7.14 | 16 | 5.82 |
| | Absent | 194 | 94.63 | 65 | 92.86 | 259 | 94.18 |

### Table 5: Internal findings of neck in case of hanging and strangulation

| Findings in neck | Hanging | | | | | | Strangulation | | | | | | Total | | |
| | Absent | Present | | | | | Absent | Present | | | | | | No. | % | No. | % | | | No. | % | | | No. | % | | | No. | % |
| Fracture of thyroid cartilage | 203 | 99.02 | 2 | 0.98 | 62 | 88.57 | 8 | 11.43 | 275 | 100.00 |
| Fracture of cricoid cartilage | 205 | 100.00 | 0 | 0.00 | 70 | 100.00 | 0 | 0.00 | 275 | 100.00 |
| Fracture of hyoid bone | 200 | 97.56 | 5 | 2.44 | 63 | 90.00 | 7 | 10.00 | 275 | 100.00 |
| Fracture of cervical vertebra | 205 | 100.00 | 0 | 0.00 | 70 | 100.00 | 0 | 0.00 | 275 | 100.00 |
Findings in neck

<table>
<thead>
<tr>
<th></th>
<th>Hanging</th>
<th></th>
<th>Strangulation</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Absent</td>
<td>Present</td>
<td>Absent</td>
<td>Present</td>
<td>No.</td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Tear of intima of carotid artery</td>
<td>98</td>
<td>47.80</td>
<td>107</td>
<td>52.20</td>
<td>275</td>
</tr>
<tr>
<td>Tear of neck muscles</td>
<td>18</td>
<td>8.78</td>
<td>187</td>
<td>91.22</td>
<td>275</td>
</tr>
<tr>
<td>Infiltration in the soft tissue</td>
<td>1</td>
<td>0.49</td>
<td>204</td>
<td>99.51</td>
<td>275</td>
</tr>
</tbody>
</table>

Table 6: Changes in subcutaneous tissue of neck in hanging and strangulation

<table>
<thead>
<tr>
<th>Type of asphyxial death</th>
<th>White glistening</th>
<th>Contused</th>
<th>Normal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Hanging</td>
<td>157</td>
<td>76.58</td>
<td>46</td>
<td>22.44</td>
</tr>
<tr>
<td>Strangulation</td>
<td>12</td>
<td>17.14</td>
<td>58</td>
<td>82.86</td>
</tr>
</tbody>
</table>

Discussion

In the total number of cases of hanging and strangulation, the offending weapons were found to be various types of ligature materials. 37.82% of the males and 27.63% of females preferred soft materials (saree, veil, towel, etc.) whereas 23.27% of men and 11.27% women used hard ligature material (wire, rope, string, etc.). These findings correlate with the study of Patel et al where they found in hanging 80% of the victims used soft materials and 20% victims used hard materials. In strangulation cases, they found that 66.67% victims were strangulated by using soft material and 33.33% victims were strangulated by using hard materials. In a study conducted only on type of ligature material used for hanging by Sharma et al they found that soft material was used in 56.36% and hard material in 43.64% cases. In another study conducted only on type of ligature material used for hanging by Naik et al they found that soft material was used in 53.97% and hard material in 46.03%. Lastly, in a study by Vijaynath et al on type of ligature material used for hanging, they found that soft material was used in 70% cases and hard material was used in 30%.

In 97.82% cases of hanging and strangulation, the ligature mark was single in number while only in 2.18% cases it was multiple. In only 7.14% cases of strangulation, the ligature mark was multiple in number.

In 95.12% cases of hanging the ligature mark was situated above the level of thyroid cartilage followed by 4.39 % of the cases showing the ligature mark below the level of thyroid cartilage, the least was a single case (0.49%) showing the ligature mark at the level of thyroid cartilage. In hanging, the ligature mark is usually situated above the level of thyroid cartilage due to the fact that during the suspension of the body there is slippage of ligature material over the upper part of the neck and the constriction force being the weight of the body. While in strangulation in 15.71% cases the ligature mark was situated above the level of thyroid cartilage in 45.71% of the cases showing the mark below the level of thyroid cartilage and in 38.57% cases showing the ligature mark at the level of thyroid cartilage which is reverse trend as compared to hanging.

In 98.54 % of the cases of hanging the ligature mark was obliquely placed over the front of neck and in only 0.49 % of the cases it was horizontal. While this trend was reverse in strangulation in which in 87.14 % of the cases the ligature mark was horizontally placed over the front of neck and in 12.86 % of the cases it was oblique.

In 99.51% cases of hanging the ligature mark was partial and in only 0.49 % of the cases showing the complete ligature mark. While in strangulation in 72.86% cases it was partial and in 27.14% cases the ligature mark was complete. These results correlate with the study by Patel et al who observed the following, among the hanging cases 100% victims had oblique ligature mark on the neck and 100 % transverse ligature mark on the neck in strangulations. In 93.75% cases the ligature mark was above the level of thyroid cartilage while in 6.25% cases the ligature mark was at the level of thyroid cartilage in hanging deaths.
The classical external asphyxial findings such as cyanosis in hanging was found in 97.07% cases, dribbling of saliva in 28.29% cases, protrusion of tongue in 31.71% of cases and it was clenched between teeth in 19.02% cases, seminal fluid discharge in 12.20% cases, external injury marks in 10.24% cases, froth from nostrils in 16.09% cases and rigor mortis in 96.10% cases. These results closely correlate with study made by Patel et al who observed the following: congestion of face 77.5%, dribbling of saliva 71.25%, discharge of semen 17.5%, discharge of feces 13.75%, struggle marks nil cases.

Internal findings in cases of hanging were found as, torn intima of common carotid artery in 52.20% cases, fracture of thyroid cartilage in 0.98%, fracture of hyoid bone in 2.44% cases, tear of neck muscles in 91.22% cases and infiltration of blood in the soft tissues of neck in 99.51% cases and subcutaneous tissue was found contused in 22.44% cases and white glistening in 76.58% which differs from the study by Patel et al who found contusions in strap muscles of neck in 6.25% cases of hanging but no carotid artery tears or fractures of hyoid bone and thyroid cartilage. This study is partly consistent with the study by Patil et al where he found no victims of hyoid bone fracture. The results however varied from the studies of Sharma et al and Clement et al.

In strangulation cases encountered cyanosis was found in 92.86% cases, discharge of semen was found in 2.86% cases, external injuries were found in 52.86% cases and froth from nostrils in 37.14% cases, tongue was protruded in 38.57% cases and it was clenched in between teeth in 21.43% cases. Rigor mortis present in 77.14% cases. These results closely correlate with the study made by Patel et al who observed the following; congestion in 100% cases, discharge of semen, urine and stools in zero percent cases, struggle marks in 100% cases.

Internal findings in strangulation cases observed were as follows- Contusions of strap muscles in 82.86% cases, fracture of thyroid cartilage in 11.43% cases, fracture of hyoid bone in 10% cases were observed. Intima of carotid artery was found torn in 60% cases while neck muscles were torn in 94.29% cases and infiltration of blood in the soft tissues was present in 100% cases. These results partially correlate with the study of Patel et al who observed strap muscle contusions in 100% cases and 66% cases having hyoid bone fracture with nil per fracture of thyroid cartilage. The results once again vary from the studies of Sharma et al, in which they found hyoid bone fracture in 21% cases, thyroid cartilage fracture in 17% cases and neck muscles were found torn in 54% cases and Clement et al, Patil et al in which they found hyoid bone fracture in 42% cases.

**Conclusion and Suggestions**

Ligature mark was situated above the level of the thyroid cartilage in most of the cases in hanging while it was either below or at the level of thyroid cartilage in strangulation. The preferred ligature material used in both hanging and strangulation cases was soft in most of the cases. As most of the postmortem cases of violent asphyxial deaths are being conducted by the doctors who are not Forensic experts and they found difficulty in concluding whether it is a case of hanging or strangulation. It is suggested that in the interest of justice to avoid confusion, in all cases of violent asphyxial deaths, the postmortem examination should be conducted by the Forensic experts only. Police personals should also be given training that they should not cut the ligature material and remove ligature material before postmortem examination so that easy differentiation of hanging and strangulation can be made. They should also routinely take the help of technology by video recording and photography of the scene of crime.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Taken from Thesis Research Committee.

**References**


Assessment of Violence Among Late Adolescence

Mansour Abdullah Falah Al-Zorfi¹, Hussein Jassim Muhammad Al-Ibrahimi²

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Abstract

Background: In today’s society, adolescents have seen an increase in violence. Teenagers face many situations that cause these problems. There are several factors: the mass media, peer pressure and society’s view of the “ideal” person. Television, radio and newspapers are all ways to get messages to people. One might watch a violent movie and decide to reactivate the scenes, causing harm to themselves or others. The hidden meanings of racism and hatred are put into music. Teenagers hear the words of their supposed role models and think it’s good to follow in their footsteps.

Objectives: Assessment of violence among Late Adolescence.

Methodology: A descriptive cross-sectional study was carried out in order to achieve the stated objectives. The study has begun from 1st September 2018. Settings of the Study: The settings of the study include (41) High secondary schools which are distributed in (3) Districts of Al-Najaf Governorate, urban (23) schools and rural (18) schools, these schools are systematic randomly selected.

Result: Showed that the most majority is low violence 51.2%.

Conclusions: The majority of the sub-domain of violence was the trend towards violence and Most of the study sample had low violence.

Recommendations: Supporting educational method by the Educational Committee that limits violent behavior of adolescents in schools, such as (moving away from scenes of an aggressive nature, beating, violence, fighting, quarrels and blood scenes) and the teacher devotes part of the lesson time to clarifying issues and harms of violence and to show the benefits of tolerance and contentment. And The school administration cooperated with the teenager’s family to identify the causes of his violence. Finally, The Ministry of Education is working to create posters that reject violence and suspend it throughout the school.

Keyword: Assessment. Violence. Late adolescence.

Introduction

Despite a widespread belief that violence begets violence, methodological problems substantially restrict knowledge of the long-term consequences of childhood victimization. Empirical evidence for this cycle of violence has been examined. Findings from a cohort study show that being abused or neglected as a child increases one’s risk for delinquency, adult criminal behavior and violent criminal behavior. However, the majority of abused and neglected Adolescence do not become delinquent, criminal, or violent.

Methodology

Design of the Study: A descriptive cross-sectional study was carried out in order to achieve the stated objectives. The study has begun from 1st September 2018.

Settings of the Study: The settings of the study include (41) High secondary schools which are distributed in (3) Districts of Al-Najaf Governorate, urban (23) schools and rural (18) schools, these schools are systematic randomly selected.
Results

Table (1) Total Statistics of the Study showing adolescent responses to Sub-Domain Violence by Observed Mean and Std. Deviation

<table>
<thead>
<tr>
<th>Sub-domain Violence</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical violence towards others</td>
<td>1.5475</td>
<td>0.5995</td>
</tr>
<tr>
<td>Verbal violence towards others</td>
<td>1.347</td>
<td>0.572</td>
</tr>
<tr>
<td>Violence in self-defense</td>
<td>1.6113</td>
<td>0.6413</td>
</tr>
<tr>
<td>The trend towards violence</td>
<td>1.7613</td>
<td>0.7266</td>
</tr>
</tbody>
</table>

*when the mean increase the violence also increase and Vice versa

Through this table, we find the sub-domain called (the trend towards violence) with a mean (1.7613), we find higher than the rest of the sub-domains (Violence in self-defense, Physical violence towards others and Verbal violence towards others) with a mean (1.6113, 1.5475 and 1.347) respectively.

Table (2) Overall assessment for Violence in the study sample.

<table>
<thead>
<tr>
<th>Violence score</th>
<th>Frequency</th>
<th>Total 1606</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Violence</td>
<td>822</td>
<td>51.2</td>
<td></td>
</tr>
<tr>
<td>Moderate violence</td>
<td>738</td>
<td>46.0</td>
<td></td>
</tr>
<tr>
<td>High Violence</td>
<td>46</td>
<td>2.8</td>
<td></td>
</tr>
</tbody>
</table>

This table showed that the most majority is low violence 51.2%.

Figure (1) Overall assessment for Violence in the study sample.

Discussion of the Results

The phenomenon of violence among adolescents has spread widely and its consequences have become serious for society. If we search for the causes of this phenomenon, we will discover that the family, the school, the media, communication and the Internet have a great role in deepening violence and its spread among youth and adolescents in a severe way that may eventually lead to destruction or imprisonment.

Table (1), which includes the sub-domain of violence, which contains four axes, where the majority of the axis (trend towards violence) was compared to the other axes.

A study by (Puigvert and et.al., 2019), in Spain, revealed that in addition to this sub-domain (the trend towards violence), which was more responsive, it found (Violence in Self-Defense) the same as the previous response.1

And another study in New Delhi conducted by (McMahon, 2011), on secondary schools, where a sample of 1520 boys and girls were collected and the study found that the vast majority of the sub-domain (violence in self-defense) From the other subdomain.2

In Nigeria, a number of researchers participated in conducting a field survey of secondary school students for a sample of 2150 students through a questionnaire distributed to them and the majority of the sub-domains results (physical violence toward others) from the rest of the other sub-domains.3
Likewise, in Turkey, a group of researchers undertook a research concerned with violence in schools among adolescents through a questionnaire that students filled in and the results showed that most of the two sub-domains (verbal violence toward other) and (violence in self-defense).  

Table 2, which included an overall assessment of violence, where the study showed that the most majority is low violence.

A study conducted by (Paterson, R. and et.al., 2012), in Melbourne, revealed that the reason for the decrease in violence is due to the good interaction of the family with the teenager and the creation of a valid environment away from conflicts and disputes, while the Arab countries and in Iraq the decrease in violence is due to the Islamic rules that reject violence and what follows of problems in society, as well as the severity of tribal judgments and not to attack others.

Also, a study conducted in Sweden (Speere, 2012), conducted on a number of secondary schools showed that students are teenagers, where they found that there is a decrease in violence for them and this is due to the environment Sound and proper education and also the appropriate way to deal with adolescents at this stage.

We also add a study in Norway on teen violence. The results showed that there is a moderate level of violence, because the poor environment and lack of interaction by the family with the teenager will give birth to a teenager with all forms of violence.

The Najaf community is considered almost one of the quietest societies in the Middle Euphrates, as is the case in disagreements, conflicts and disputes, because the province has a great sanctity in the hearts of people, as it contains many holy shrines and the most important of the shrine of Imam Ali (the best of prayers and peace) and also the presence The most important religious references that always seek calm, advice and guidance and also rejects all forms and types of violence and aggression and this in turn is reflected in the behavior of this society in teaching, education, dealing and resolving all disputes by peaceful means without resorting to fighting and conflicts (researcher).

Conclusions

The majority of the sub-domain of violence was the trend towards violence and Most of the study sample had low violence.

Recommendations: Supporting educational method by the Educational Committee that limits violent behavior of adolescents in schools, such as (moving away from scenes of an aggressive nature, beating, violence, fighting, quarrels and blood scenes).

The teacher devotes part of the lesson time to clarifying issues and harms of violence and to show the benefits of tolerance and contentment.

The school administration cooperated with the teenager’s family to identify the causes of his violence.

The Ministry of Education is working to create posters that reject violence and suspend it throughout the school.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing, University of Kufa, Iraq and all experiments were carried out in accordance with approved guidelines.

References


A 10 Year Autopsy Study of Hospital Deaths Brought to the Mortuary of a Tertiary Care Hospital in North East India

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Abstract

Without autopsies, hospitals bury their mistakes. However, not every hospital death is autopsied. As a result, experts say, diagnostic errors are missed, opportunities to improve medical treatment are lost and health-care statistics are skewed. In this 10 year retrospective study, hospital death cases which were brought for autopsy were analyzed with respect to year wise incidence, sex and age wise incidence, reasons for hospitalization and cause of death to ascertain whether the deaths were due to medical negligence or due to natural course of events of the disease. The findings reveal that 40% of the cases were due to negligence. This substantial loss could have been prevented if timely intervention was done. The study aims to highlight this important aspect of medical practice.

Keywords: Hospital deaths, autopsies, medical negligence.

Introduction

Without autopsies, hospitals bury their mistakes. Hospital autopsies have become a rarity. As a result, experts say, diagnostic errors are missed, opportunities to improve medical treatment are lost and health-care statistics are skewed. Studies have placed the number of deaths as high as 250,000 deaths per year, which would make medical error the third leading cause of death, behind cancer and cardiovascular disease. It is also shown that the number of previously healthy people who die every year from hospital error is about 7,150. The remainder of preventable deaths occurred in patients with less than a three-month life expectancy. Most of the hospital errors involved poor monitoring or management of medical conditions, diagnostic errors and errors related to surgery and procedures, the study shows.

Material and Method: After obtaining ethical clearance from the institute’s Research Ethics Board, a retrospective analysis of post mortem records of hospital death cases brought for autopsy to the morgue of a tertiary care hospital in North East India was done. The period was from 2010 to 2019. Cases were analyzed with respect to year wise incidence, sex and age wise incidence, reasons for hospitalization and cause of death to ascertain whether the deaths were due to medical negligence or due to natural course of the disease. Findings are the compared with prevailing trends elsewhere in the world.

Results and Observations: Fig. 1 shows the year wise incidence. Cases were maximum in 2016 and show a gradual increasing trend towards the later part of the study period as shown in Fig. 1.

Male and female cases were equal in number i.e., 50% each (Fig. 2).

As shown in Fig. 3, regarding the age wise incidence, cases were maximum in the 31-40 yr (31.8%) followed by 51-60 yr(22.7%) and least in the lower age groups.

Fig. 4 shows the reasons for hospitalization. Heart disease was the main reason for hospitalization followed by delivery.

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Fig. 5 shows that 40.9% of the deaths were due to medical negligence or gross medical error.

The various causes of death are shown in Table 1. Myocardial infarction was the commonest cause of death followed by followed by bronchopneumonia and coronary artery disease. Out of the 6 cases which were brought for delivery, 5 parturients and 1 newborn died during or after delivery. Cervical haematoma and post partum haemorrhage (PPH) following Normal Vaginal Delivery (NVD), Post Caesarian Section(CS) amniotic fluid embolism, Intrapartum haemorrhage and Post-partum haemorrhage following Normal Vaginal Delivery, Uterine rupture during Caesarian Section, Post-partum haemorrhage following Caesarian Section and Suffocation of newborn with mucoid substance due to non-suction following Normal Vaginal Delivery were the various causes of mortality.

In one case, Lung injury following intercostal tube insertion was the cause of death.

The remaining included deaths due to cirrhosis (2 cases) and cysticercosis (1 case).
Fig 3: Age wise distribution

Fig 4: Reasons for hospitalisation
Table 1: Causes of death

<table>
<thead>
<tr>
<th>Illness</th>
<th>No. of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical haematoma and PPH following NVD</td>
<td>1</td>
</tr>
<tr>
<td>Bronchopneumonia</td>
<td>3</td>
</tr>
<tr>
<td>Post operative haemorrhage (GB &amp; appendix)</td>
<td>1</td>
</tr>
<tr>
<td>Cirrhosis</td>
<td>1</td>
</tr>
<tr>
<td>Post CS amniotic fluid embolism</td>
<td>1</td>
</tr>
<tr>
<td>Chronic hepatitis &amp; cirrhosis</td>
<td>2</td>
</tr>
<tr>
<td>Intrapartum and post partum haemorrhage foll. NVD</td>
<td>1</td>
</tr>
<tr>
<td>Pulmonary oedema due to neurocysticerosis</td>
<td>1</td>
</tr>
<tr>
<td>Coronary artery disease</td>
<td>2</td>
</tr>
<tr>
<td>Myocardial infarction</td>
<td>5</td>
</tr>
<tr>
<td>Uterine rupture during LSCS</td>
<td>1</td>
</tr>
<tr>
<td>Suffocation of newborn with mucoid substance due to non-suction foll. NVD</td>
<td>1</td>
</tr>
<tr>
<td>PPH foll. CS</td>
<td>1</td>
</tr>
<tr>
<td>Lung injury foll. intercostal tube insertion</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22</strong></td>
</tr>
</tbody>
</table>

**Fig. 5: Manner of death**

**Discussion**

In a review of the patient records of 100 adults who died in 10 hospitals across England in 2009, it was observed that one death in 20 had a greater than 50% chance of being preventable. In the present study, it is evident from the findings that 40.9% of the cases could be due to medical negligence or gross medical error.

In the present study, delivery related deaths were maximum among the deaths due to medical negligence. Post partum haemorrhage, uterine rupture and amniotic fluid embolism were the prominent causes of death. In one case, the newborn died due to suffocation of the mucus which is quite different from other studies. In a study on The Maternal Mortality Rate (MMR) over a nine-year period (1998-2006), the MMR was 827/100000 live births (471 maternal deaths against 56944 live births). An autopsy was performed in 277 cases (58.8%). In the autopsy group, the most common causes of maternal mortality were pre-eclampsia (14.44%) and hemorrhage (11.55%). However, indirect causes like infectious diseases (9.75%) and cardiac (9.75%) diseases also contributed to maternal deaths.

A total of 13,074 autopsy records of fatal pulmonary
embolism were analyzed using univariate and multivariate conditional logistic regression. Pulmonary embolism was considered fatal in 328 (2.5%) patients. In the multivariate analysis, conditions that were more common in patients who died of pulmonary embolism were atherosclerosis, congestive heart failure and neurological surgery. Some conditions were negatively associated with fatal pulmonary embolism, including hemorrhagic stroke, aortic aneurism, cirrhosis, acquired immune deficiency syndrome and pneumonia. Interestingly, in the control group, patients with hemorrhagic stroke and aortic aneurism had short hospital stays (8.5 and 8.8 days, respectively) and the hemorrhage itself was the main cause of death in most of them (90.6% and 68.4%, respectively), which may have prevented the development of pulmonary embolism. Cirrhotic patients in the control group also had short hospital stays (7 days) and 50% died from bleeding complications. In our study, one case died due to amniotic fluid embolism following Caesarian section, which was diagnosed after an autopsy examination.

One neonate in our study died of suffocation with mucus due to lack of suction by the attending doctor. According to a study, the factors associated with neonatal deaths were fetal congenital anomaly, low birth weight, first minute Apgar score under 7; zero to 3 prenatals appointments and prematurity, none of which played any role in our case which indirectly indicates that the death was due to gross medical negligence.

**Conflict of Interest:** Nil

**Acknowledgement:** Nil

**Source of Funding:** Nil

**Ethical Clearance:** Taken from Research Ethics Board, Regional Institute of Medical Sciences, Imphal.

**References**

1. Makary MA, Daniel M. Medical error—the third leading cause of death in the US. BMJ 2016; 353 DOI: https://doi.org/10.1136/bmj.i2139 (Published 03 May 2016).
A 10 Year Post Mortem Study of Choking Cases Brought to the Mortuary of a Tertiary Care Hospital in Imphal

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Abstract

Choking is the obstruction of air flow into the lungs and is almost always accidental. In this paper, cases of choking mistaken to be deaths due to foul play are studied. Any complaint is not true unless it is proved so. In all these cases, family members blamed the deaths on some parties who were in fact completely innocent. Meticulous autopsy helped in establishing the exact cause of death in these cases by disproving the false charge of assault. From the legal standpoint, the importance of establishing an exact diagnosis is obvious.

Keywords: Allegations, foul play, choking.

Introduction

Choking is the mechanical obstruction of the flow of air from the environment into the lungs. Choking prevents breathing and can be partial or complete, with partial choking allowing some, although inadequate flow of air into the lungs. Prolonged or complete choking results in asphyxia which leads to anoxia and is potentially fatal. Choking can be caused by (i) physical obstruction of the airway by a foreign body, (ii) respiratory diseases that involve obstruction of the airway and (iii) compression of the laryngopharynx, larynx, or trachea in strangulation and intravenous larygospasm. Obstruction of the airway can occur at the level of the pharynx or trachea. Food that can adapt their shape to that of the pharynx (such as bananas and gelatinous candies) can be a danger not just for children but for persons of any age. Among some of the most notable cases of choking deaths, mention may be made of Air Marshal Subroto Mukherjee, the first Chief of the Air Staff of the Indian Air Force who died on November 8, 1960 at Tokyo, by choking on a piece of food lodged in his windpipe.

On the other hand, allegations of excessive use of force and extrajudicial killings by police or armed forces are common in the north-eastern state of Manipur. A petition filed by two non Governmental organizations with the Supreme Court of India claimed that at least 1528 extrajudicial killings were carried out by the police or security forces in Manipur during 1979-2012 (supreme Court of India Writ Petition [Criminal] No. 129 of 2012. Interestingly, one of the present cases was also brought as a case of death due to police atrocity which was disproved by autopsy as it turned out to be due to choking and a case of natural death.

Material and Method

A retrospective analysis of all the deaths due to choking was done in the Department of Forensic Medicine and Toxicology of a tertiary care teaching hospital in Imphal. After obtaining Institutional Ethics Committee clearance, the cases were studied with regard to the sex and age wise distribution, type of food present, site of obstruction, association with alcohol and activity before choking.

Results and Observations

A total of eight cases were brought for autopsy in the 10-year period. All the cases were males and all
these cases were associated with allegations of foul play. Maximum incidence was seen in the 21-30 yr age group followed by 0-10 and 11-20 yr age groups as shown in Fig. 1. Presence of food particles in the respiratory tract beyond the trachea was seen in seven cases and alcohol was associated in six cases as shown in Figs. 2 & 3. Table 1 shows the activity before death. In one case, a three-year old boy was fed a piece of bread and he choked on it and died the next day due to aspiration bronchopneumonia. In four cases, the victims were found dead and on autopsy food particles were seen in the respiratory tract beyond the bronchi. In one case, the victim played football just after food and started choking and died. In another case, the victim slept just after dinner and got up choking and died. There was also a case where the victim took a walk after dinner and started choking and died. Regarding the site of obstruction, food particles reached the bronchioles in 1 case, trachea in one case and bronchi in five cases and in the case of the child no food particles could be seen as the child had consumed only a small piece of bread (Table 2). Regarding stomach contents, five cases had semi-digested food particles, one case had rice particles, another case had vegetable particles and in the case of the three-yr old child, only some mucoid substance was present (Table 3). Similar substances were present in the respiratory tracts of the victims.

Fig. 1: Age wise distribution
Table 1: Activity before death

<table>
<thead>
<tr>
<th>Activity</th>
<th>No. of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating</td>
<td>1</td>
</tr>
<tr>
<td>Sleeping just after dinner</td>
<td>1</td>
</tr>
<tr>
<td>Walking after dinner</td>
<td>1</td>
</tr>
<tr>
<td>Playing football after lunch</td>
<td>1</td>
</tr>
<tr>
<td>Found dead</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 2: Obstruction site

<table>
<thead>
<tr>
<th>Site of obstruction</th>
<th>No. of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larynx</td>
<td>0</td>
</tr>
<tr>
<td>Trachea</td>
<td>1</td>
</tr>
<tr>
<td>Bronchi</td>
<td>5</td>
</tr>
<tr>
<td>Bronchioles</td>
<td>1</td>
</tr>
</tbody>
</table>
Table 3: Stomach contents

<table>
<thead>
<tr>
<th>Stomach content</th>
<th>No. of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>1</td>
</tr>
<tr>
<td>Vegetables</td>
<td>1</td>
</tr>
<tr>
<td>Semi-digested food</td>
<td>5</td>
</tr>
<tr>
<td>Mucoid substance</td>
<td>1</td>
</tr>
</tbody>
</table>

Discussion

Airway obstruction can be of anatomical or mechanical origin. Anatomical obstruction may be produced by anatomical structures such as tongue, swollen tissues of mouth and throat like inflamed epiglottis. In these natural deaths, there is obstruction of the airway by the inflamed epiglottis and adjacent soft tissue and are of anatomical origin as said above.

Mechanical obstruction occurs due to foreign body. Physical findings of wheeze, rhonchi, stridor, or retractions were associated significantly with a diagnosis of an unwitnessed foreign body. Death due to choking is due to unintentional ingestion or inhalation of food or other objects resulting in the obstruction of respiration.

Choking is almost always accidental. In the above cases, the deaths which were suspected to be due to foul play, turned out to be accidental deaths due to mechanical airway obstruction by food particles. Some of the common risk factors of choking are old age, poor dentition and alcohol consumption. Other risk factors include chronic disease, sedation, eating risky food and senility, although choking is reported to be higher in the age above 65 yrs, we saw no case in this age group. In the present cases, there was history of consumption of alcohol in one case. Some of the other common causes of choking include swallowing large pieces of poorly chewed food, eating while talking excitedly or laughing, or eating too fast and walking, playing, or running with food or object in the mouth. In one case the person was playing football just after eating. In another case, the person went for a walk after dinner and died due to choking.

On the other hand, gastric contents are aspirated in the windpipe due to the handling of the body, or as a terminal event in natural death (agonal artefact) or due to resuscitation. Hence, agonal artefact may look like a case of choking and vice versa. However, the difference lies in the extent up to which food particles enter the lungs. In choking, the bronchioles are filled with food particles whereas in agonal artefact, food particles may reach only up to the larynx. In all these cases the food particles were found beyond the bronchi which ruled out agonal artefact.

Even though the allegation was that of foul play, the points in favor of choking in these cases were the absence of signs of external or internal physical injury (except minor abrasions in two of the cases), the presence of food particles in the respiratory tract reaching up to the bronchioles (which ruled out agonal artefact) and the presence of signs of asphyxia.

Conclusion

Any complaint is not true unless it is proved so. Meticulous autopsy helped in establishing the exact cause of death in these cases by disproving the false charge of assault thereby avoiding public outrage. From the legal standpoint, the importance of establishing an exact diagnosis is obvious. Whenever death is attributed to heart disease, the beneficiary of the estate is denied the double indemnity insurance benefits that are allotted when death can be proved to have occurred as the result of accidental inhalation of food. Therefore, establishing choking as the real cause of death gives two benefits, i.e., allegations are allayed and indemnity benefits are doubled if the life of the deceased has been insured.

Conflict of Interest: Nil
Acknowledgement: Nil
Source of Funding: Nil
Ethical Clearance: Taken from Research Ethics Board, Regional Institute of Medical Sciences, Imphal.

References


The Effects of Deep Breathing on Blood Pressure Reduction in Elderly Hypertensive Patients at a Retirement Home in Surabaya

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²Lecturer Faculty of Nursing, Universitas Airlangga Surabaya, 60115, Indonesia

Abstract

Introduction: The hypertension incidences in the elderly does not only cause stroke but also an increase in the mortality rate. The elderly who suffer from hypertension require further therapy to lower their blood pressure levels. One of the self-therapies that nurses can provide to hypertensive patients is deep breathing therapy. This study aims to determine the effects of deep breathing therapy in the elderly with hypertension.

Method: This study employed a quasi-experimental research design with two groups of pretest-posttest design. A total of 12 research samples were divided into two groups: the treatment group and the control group, each group consisted of six respondents. The research instruments utilized were a questionnaire, SOP (Standard Operating Procedure) of breathing techniques, blood pressure measurement tools (sphygmomanometer and stethoscope) and observation sheets on blood pressure measurement. The data were analyzed using paired t-test and independent t-test.

Results: All of the respondents in the study were women aged 55 years old or older. The mean value of systolic blood pressure before being given the intervention was 158.33 mmHg in the treatment group and 157.69 mmHg in the control group. The analysis with an Independent t-test between the control group and the treatment group indicated \( p = 0.002 \) (\( \alpha<0.05 \)) as the difference in systolic blood pressure between the two groups. The treatment group experienced a drop in blood pressure by 10-30 mmHg.

Conclusion: Deep breathing therapy effectively reduces blood pressure in the elderly with hypertension by consistent interventions for seven consecutive days.

Keywords: Deep breathing intervention, elderly, isolated hypertension.

Introduction

The elderly experience the aging process that affects their physical and mental changes. Therefore, they have a higher risk of hypertension with the prognosis for stroke by 36% and an increase in the number of deaths by 14%.

Hypertension is a significant risk factor of cardiovascular morbidity and mortality, especially in the elderly. Such chronic disease frequently occurs without symptoms, thus requiring optimal control. Hypertension in the elderly can occur due to increased sodium sensitivity, isolated systolic hypertension with arterial stiffness and endothelial dysfunction that increase with age.

Men and women older than 55 years old highly at risk of suffering from hypertension, with a prevalence of 93% at approximately 80 years old. The hypertension incidences in the elderly living in rural areas are very high, with a prevalence of 40.5%, where 39.2% occur...
in men and 40.8% in women. The Agency of Health Research and Development report in 2011 confirmed that the cause of death in 15 districts/cities in the elderly group was hypertension, with 4.4% of deaths at <65 years old and 4.6% at >65 years old.

The preliminary studies conducted at Hargodedali Retirement Home, Indonesia, reported that 20 out of 51 elderly patients (39.2%) suffered from hypertension. Hypertension incidences in Hargodedali Retirement Home were recorded as the highest compared to other places. The attempts made to lower blood pressure, including pharmacological therapy, green banana and green tea consumption, as well as exercise, for the elderly every Monday, were still not optimal.

Hypertension that generally occurs in the elderly requires further therapy, which is a treatment that not only decreases the mortality rate but also reduces stroke incidences. The purpose of treating patients with isolated hypertension is to lower their blood pressure to the normal level while hypertension management in the elderly can be performed by pharmacological and nonpharmacological techniques.

Deep breathing techniques are part of nursing interventions that aim to provide various benefits. The effects of deep breathing techniques include pulse decrease, muscle tension decrease and metabolic rate decrease. Meanwhile, the techniques increase global awareness, peace and wellness feelings and relaxed alertness period. The advantage of deep breathing exercises is that it can be performed at anytime and anywhere. Furthermore, the techniques are very easy to perform independently by the patient without a medium to relax tense muscles.

The functional consequences theory elaborates that age is related to changes and risk factors. Without the intervention, the functional consequences will be negative. Otherwise, with the intervention, the functional consequences will be positive. The role of gerontological nursing is to identify factors that cause negative functional consequences and initiate interventions to foster positive functional consequences. In accordance with this theory, the elderly hypertensive patients who perform deep breathing techniques can change negative consequences in the form of blood pressure increase into the positive consequences in the form of blood pressure decrease. This study aims to determine the effect of deep breathing on reducing blood pressure in the elderly with hypertension.

**Method**

This study employed a quasi-experimental research design with two groups of pretest-posttest design. The research site was at Hargodedali Retirement Home, Surabaya, Indonesia. In this design, groups that fulfilled the inclusion criteria were observed for their blood pressure. There were inclusion criteria set by the researchers, i.e., the elderly with normal hearing, a patient who received hypertension treatment and were willing to be the respondents. Furthermore, the elderly would be intervened using deep breathing techniques. The intervention was performed for seven days, while the respondents’ blood pressure was observed before and after the treatment.

The sampling techniques employed in this study were non-probability sampling with a purposive sampling type. The samples in the control group consisted of 6 respondents, while the treatment group, which performed deep breathing techniques, were six respondents. The total samples in this study were 12 respondents.

The determination of the selected samples consisted of isolated hypertensive patients who fulfilled the established inclusion and exclusion criteria. After specifying the sample size of the study (12 elderly), then the data collection and matching were carried out, i.e., the process of adjusting confounding variables between 2 groups (6 elderly in each group), thus the confounding variables were divided equally.

The instrument utilized in this study was questionnaires related to demographic data, SOP (Standard Operating Procedures) for deep breathing techniques and observation sheets for blood pressure measurement, sphygmomanometer and stethoscope. The observation sheet in this study contained a format consisting of respondents codes, age, sex and blood pressure before and after deep breathing exercises in the treatment and control groups designed by the researcher.

The data analysis was processed based on existing data by using tables and statistical tests. The variables tested were the pretest and posttest of systolic blood pressure as well as the comparison results between the treatment group and the control group. The interval data for blood pressure measurement using paired t-test were used to compare the interval data of pre and post-treatment tests. Meanwhile, the independent t-test was employed to compare the interval data of the treatment group and the control group.
Results

The first research results were related to the demographic data of the elderly respondents involved. Twelve respondents who were divided into two groups were recorded for their general information, including age, sex, smoking history, family history of hypertension, their savoury tooth and regular exercise.

Table 1 Characteristics Respondents

<table>
<thead>
<tr>
<th>No.</th>
<th>Characteristics</th>
<th>Treatment</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td>0</td>
</tr>
<tr>
<td></td>
<td>Female</td>
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</tr>
<tr>
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<td>Total</td>
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<tr>
<td>2</td>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>55-70 years old</td>
<td>2</td>
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</tr>
<tr>
<td></td>
<td>70-85 years old</td>
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<td>66.7</td>
</tr>
<tr>
<td></td>
<td>Total</td>
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<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Smoking status</td>
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<tr>
<td></td>
<td>Never smoked</td>
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<td>100</td>
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<tr>
<td></td>
<td>Elementary school</td>
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<tr>
<td></td>
<td>Total</td>
<td>6</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Family History of Hypertension</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>2</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>No</td>
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<td>66.7</td>
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<td></td>
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</tr>
<tr>
<td>5</td>
<td>Savoury Tooth</td>
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</tr>
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<td></td>
<td>Yes</td>
<td>0</td>
<td>0</td>
</tr>
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</tr>
<tr>
<td>6</td>
<td>Regular exercise</td>
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<tr>
<td></td>
<td>Gymnastics</td>
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<tr>
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<td>Total</td>
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<td>100</td>
</tr>
</tbody>
</table>

Systolic Blood Pressure Before and After the Intervention: The respondents’ characteristics based on age suggested that most of the respondents in each group were 70-85 years old, i.e., 4 people in the intervention group (66.7%) and 4 people in the control group (66.7%). The respondents’ characteristics by gender indicated that all respondents in each group were women. The respondents’ characteristics based on smoking status denoted that all respondents in each group had never smoked.

In addition, the respondents’ characteristics based on a family history of hypertension suggested that most of the respondents in each group had a family member with hypertension, i.e., there were 2 people in the intervention group (33.3%) and 2 people in control group (33.3%). Regarding the respondents’ characteristics based on savoury tooth, all of the respondents in each group did not like the salty taste. This data was obtained from interviews related to demographic data. Furthermore, the nutrition fulfillment at the elderly nursing home was adjusted to the type of illness that the respondent suffered. Thus, the nutrients fulfillment was homogeneous.
Systolic Blood Pressure Before and After the Intervention: The mean in systolic blood pressure is different before and after intervention in each group. It was observed that the mean value of systolic blood pressure before intervention in the treatment group was 158.33 mmHg and in the control group was 157.69 mmHg. After the intervention was performed with 21 times of deep breathing exercises for one week, the mean value of systolic blood pressure in the treatment group reached 140.00 mmHg.

The results of the advanced statistical analysis utilizing the Independent t-test between the control group and the treatment group obtained \( p=0.002 (\alpha <0.05) \). Therefore, it is concluded that there were differences in systolic blood pressure between the two groups. The preliminary data measurement (pretest) of blood pressure in the intervention group, with 6 hypertensive respondents indicated 2 people in stage 1 hypertension and 4 people in stage 2 hypertension. In the control group, it is observed that there were 3 people in stage 1 hypertension and 3 people in stage hypertension 2.

The blood pressure results in the treatment group after provided with deep breathing exercises (posttest) also suggested that all respondents (6 people) tended to experience a decrease which changed the hypertension category, i.e., 1 respondent reached the prehypertension category (120-139 mmHg) and 5 respondents reached the stage 1 hypertension category (140-159 mmHg). On the other and, in the control group, there were 2 respondents reached stage 1 hypertension category and 4 respondents with stage 2 hypertension category (\( \geq160 \text{ mmHg} \)).

Discussion

The critical factor causing hypertension is age. The older a person, the higher a person’s blood pressure. That condition is related to changes in anatomical and physiological structures, especially of the cardiovascular system changes due to the aging process. It occurs because of a decrease in blood vessel elasticity, blood vessel stretching power and smooth muscle relaxation. The factors contributing to the thickening and stiffening of the endothelial blood vessels in the aging process include an increase in collagen and calcium and a decrease in elastin, calcification and fat deposits.

All respondents in this study were female, so the case was similar to prior studies. In the prior study results, it was suggested that hypertension tended to occurred higher to women (58.3%) than to men (41.7%) after menopause. It occurred higher to women because of the production of their sexual hormones changes during menopause, which cause an increase in blood pressure. Women are greatly affected by several hormones that function to protect women from hypertension and its complications, including the thickening of blood vessels or atherosclerosis walls.

Thenext factor causing hypertension is due to diet food consumption, for example, unable to undertake a
low-salt diet. The respondents consumed food according to the food served based on the nursing policy. There was a special diet menu as the treatment, so there were limits as a benchmark to monitor whether the respondents had performed a low salt diet appropriately and consistently. Sodium consumption can be a significant factor causing hypertension. The compliance of low calcium, potassium and magnesium diet contributed to lowering blood pressure.

The treatment group had performed deep breathing techniques three times in one week for 7 days. In every 15 minutes of exercise, there was a decrease in systolic blood pressure by 140.00 mmHg. Therefore, there was a change regarding the hypertension category, which declined to stage 1 hypertension. Slow breathing frequency increases vascular vasodilation, which activates the Hering-Breuer reflex and then reduce the chemoreflex sensitivity and increase baroreflex. The deep breath therapy is beneficial as tense muscles relaxation, metabolic rate decrease, feelings of peace and alertness improvement and lowering blood pressure.

After 7 days of intervention, the mean of systolic blood pressure was the lowest in the deep breathing treatment group, which was 140 mmHg. Meanwhile, the control group reached 160 mmHg. The further analysis stated that the results obtained in both groups signifying systolic blood pressure decrease, which attributed to deep breathing exercises in the elderly with isolated hypertension. Deep breathing exercises in the form of slow breathing led to changes in breathing pattern intervals, which resulted in baroreflex efficiency increase. Eventually, the blood pressure can be lowered.

The role of gerontological nursing was to identify the factors causing negative functional consequences after initial deep breathing intervention that would produce positive functional consequences. Gerontological nursing aims to make the elderly relaxed and comfortable. The slowed breathing frequency triggers a decrease in the impulse of the respiratory and cardiovascular system. The respiratory and cardiovascular systems have the same regulatory mechanism. A change to one system will affect the other system functions. The deep breathing maximizes lung expansion during breathing. In addition, the breath-holding phase aims to maximize the oxygen diffusion in the lungs to acquire the oxygen better fulfillment for cellular metabolism in the elderly. Slow breathing can reduce sympathetic nerve activity by increasing central inhibitory rhythm. Hence, it created comfort and relaxation.

Conclusion

Deep breathing exercises and techniques effectively reduce blood pressure in the elderly with hypertension. It is corroborated by the difference in systolic blood pressure before and after the intervention in the elderly with isolated hypertension. Besides, it is also proved by a mean difference between the treatment and control groups. Breath control can reduce systolic blood pressure in the elderly with isolated hypertension by 3 times exercises a day and each exercise is performed in 15 minutes for 7 days.

Ethical Clearance: The present study fulfilled the ethical feasibility test at Universitas Airlangga with certificate number 260-KEPK.

Conflict of Interest: None declared

Source of Funding: This study is done with individual funding.

Reference


Molecular Typing and Phylogenetic Analysis of Cutaneous Leishmania from Iraqi Patients

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Abstract

This study aimed for molecular characterization of local isolates of \textit{L. tropica} and \textit{L. major} and their relatedness to reference isolated from neighboring countries. Exudates and dermal tissues were collected from the cutaneous lesions of 50 newly diagnosed patients with CL. Leishmania DNA was extracted from lesion exudate and 5.8S rRNA gene was amplified using two sets of specific primers through nested PCR. A total of 12 PCR products were directly sequenced and the resultant sequences were aligned with reference sequences in National Center for Biotechnology Information (NCBI). A phylogenetic tree was constructed for local \textit{Leishmania} isolates with the reference isolates using Mega 6 software. According to alignment results out of 12 sequences, 9 sequences were belonging to \textit{L. major}, while 3 sequences were belonging to \textit{L. tropica}. All local \textit{L. major} isolates were very close to reference isolate KP773404.1 (an Iranian isolate), while all local \textit{L. tropica} isolates were very close to reference isolate KY612611.1 (an Iranian isolate) with an identity of 98%. Phylogenetic trees confirmed that closest isolates for local Leishmania (whether \textit{L. tropica} or \textit{L. major}) was the Iranian isolate. These data indicate that local isolates of \textit{L. tropica} and \textit{L. major} are closely related to Iranian isolates.

Keywords: Cutaneous leishmaniasis, phylogenetic analysis.

Introduction

Leishmaniasis, a disease caused by different species of Leishmania, is the third most significant arthropod-borne disease for the global burden of diseases[1]. Among the three types of the disease (cutaneous, visceral and mucocutaneous), the cutaneous leishmaniasis (CL) is the most common form of the disease which encompasses about three-fourths of the total cases. This disease is one of the few infectious diseases recently rising in incidence globally[2,3].

Molecular characterization of the causative agent of CL may facilitate the determining molecular epidemiology and hence can help in introducing effective control programs. Polymerase chain reaction (PCR) brought about the infusion of techniques for identification and genetic characterization of \textit{Leishmania}[4]. Different genes such as 5.8S rRNA and internal transcribed spacer-1 gene have been used successfully for both diagnosis and molecular characterization of CL[5]. Studies concerning phylogenetic analysis and molecular characterization of \textit{L. tropica} and \textit{L. major} are scarce in Iraq despite the endemicity of the disease.

Therefore, this study aimed to molecular characterization of local isolates of \textit{L. tropica} and \textit{L. major} and their relatedness to reference isolated from neighboring countries.

Subjects and Method

The study Population: This study was performed in the dermatology clinic of Baquba Teaching Hospital in Diyala city/Iraq, from November 2018 to the end of August 2019. A total 30 newly diagnosed patients...
with confirmed CL were included. The diagnosis of CL was based on clinical signs and detection of Leishman Donovan bodies with direct microscopic examination after staining of lesion exudate with Geimsa stain.

**Dermal scraping:** A deep disinfecting of the indurated active margin of the lesion with 70% ethanol was performed. Samples were taken by using disposable sterile surgical blade to make an incision in the border of the lesion. Exudates and dermal tissues from the wall of the slit were scraped and smeared on two glass slides. The touch impression smears were air dried, methanol-fixed, stained with Giemsa and finally examined for amastigotes by microscopy.

**Leishmania gene amplification:** Leishmania DNA was extracted from lesion exudate using a ready commercial kit (Analytikjena/Germany). Nested PCR technique was used for amplification of 18.5S rRNA *Leishmania* gene. The primers of the first round were forward: 5′- CTGTAGGTGACCTGCAGCAGCTGGATCATT-3′ and reverse: 5′-GCGGGTAGTCCTGCACACTCAGGTCTG-3′ with an expected fragment length of 110 bp. The primers of the second round were forward: 5′-CTGGATCATTTCGAGATGCATT-3′ and reverse: 5′-TGATACCATTATCGACATT-3′ with an expected fragment length of 350 bp. The PCR conditions in the first and second round were as previously mentioned[6].

**DNA Sequencing and Sequence Alignment:** Twelve PCR products form the second round nested-PCR were sent abroad (Macrogen/Korea) for direct sequencing. The resultant sequences were aligned with 24 references sequences in the National Center for Biotechnology Information (NCBI) using Basic local alignment search tool (BLAST). The identity between the local and reference sequences was calculated. Mega 6 software was used to construct the phylogenetic tree for *L. torpica* and *L. major* local isolates.

**Results**

**Gel Electrophoresis:** The nested PCR products of the first and second round were subjected to a 2% agarose gel electrophoresis and examined by exposure to ultra violet light after Red Stain staining (Figure 1).

![Gel electrophoresis on 2% agarose at 5 volt/cm² of first (upper) and second (lower) nested PCR products. M: DNA ladder, lanes 1-15: PCR products from CL patients](image_url)
Sequencing and Sequence Alignment: The PCR products of 12 samples were sent abroad to Macrogen Company (Korea) for direct sequencing. The resultant sequences were compared with reference sequences using Basic Local Alignment Search Tool (BLAST) program at the National Center Biotechnology Information (NCBI) which is available online at (http://www.ncbi.nlm.nih.gov).

According to alignment results out of 12 sequences, 9 sequences were belonging to *L. major*, while 3 sequences were belonging to *L. tropica*. All local *L. major* isolates were very close to reference isolate KP773404.1 (Iranian isolate), while all local *L. tropica* isolates were very close to reference isolate KY612611.1 with an identity of 98%.

The base substitution, location of this substitution, nucleotide change each isolates in relation to reference isolates are presented in Table 1. The base substitution ranged from 2-6 bases at different sites of the gene with identities ranging from 97-99%.

**Table 1: The base substitution, location of this substitution, nucleotide change for each isolate in relation to reference isolates**

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**Phylogenetic Tree:** Mega 6 software was used to construct the phylogenetic tree of the local isolate of *L. tropica* in relation with 14 most closest reference isolates (Figure 2). The tree showed two main clades: on containing three reference isolates (from USA, Libya and Tunisia) and the other clade involving the local isolate and all the other reference isolates. The closest isolates for local Leishmania was the Iranian isolate.
Figure 2: Phylogenetic trees for 5.8S rRNA gene constructed by the maximum likelihood method for local *L. tropica* isolate and 14 reference isolates. Phylogenetic distance was estimated using the Kimura two-parameter model. The tree was supported by bootstrapping with 1000 replicates\[7\].

Similarly, a phylogenetic tree was constructed between the local isolate of *L. major* with 14 closest reference isolates. The tree (Figure 3) had two main clades: one contains only a Turkish isolate while the other involving the local isolate with all other reference isolates. The local isolate had a 98% identity to all reference isolates except the Turkish isolate (identity 97%).

Figure 3: Phylogenetic trees for 5.8S rRNA gene constructed by the maximum likelihood method for local *L. major* isolate and 14 reference isolates. Phylogenetic distance was estimated using the Kimura two-parameter model. The tree was supported by bootstrapping with 1000 replicates\[7\].
Discussion

To evaluate genetic diversity of *Leishmania*, authors have employed several DNA markers whether nuclear or extranuclear. The most commonly used markers were 18S-rRNA, mini-exon, gp63 gene locus, HSP-70, microsatellites, minicircles of kinetoplast DNA (kDNA), ribosomal internal transcribed spacer regions (ITS-rDNA) and cytochrome b (Cyt b) (kDNA maxicircle) [8,9]. The ITS-rDNA marker, for example, was utilized to deduce the evolutionary relationships in genus *Leishmania* because of its conserved region with relatively low intracellular polymorphisms [10].

The most interesting finding in the current study was that the limited variation among the investigated isolates compared with the other international studies. For example, in Iran, Mohammadihaet al. [11] amplifies the ITS-rDNA gene for 25 isolates and used RFLP for genotyping of PCR products. The authors reported high diversity among isolates whether they belong to *L. tropica* or *L. major*. In another study, Azmi et al. [12] reported that *L. tropica* is a very heterogenous species and this was evidenced by low bootstrap values obtained on the phylogenetic tree. The low diversity in the current study may be attributed mainly to a geographical reason, because almost all samples were collected from a small geographical location.

The other most interesting finding was that local isolates had a relatively high compatibility to isolates from different countries. In fact, this does not reflect a reciprocal transmission from these countries to Iraq and vice versa. Rather, in such countries, different isolates have been recorded in NCBI, among which there are some isolates which resemble other international isolates including Iraqi isolates.

Collectively, these data indicate that local isolates of CL (whether *L. major* of *L. tropica*) have less genetic variability compared with internal isolates and they are very close to their counterpart Iranian isolates. As such, it is of paramount importance to restrict the individual travelling between the two countries for effective control of the diseases especially for anthropotic CL.

Acknowledgement: The authors highly appreciate the great help from Dr. Mohammed Ali during the blood sample collection

Conflicts of Interest: The authors declare that they have no conflict of interest.

Ethical Clearance: This study was approved by the Institutional Review Board/College of Medicine/Diyala University. A consent from each patient was obtained prior to data collection after explaining the aim of study. The confidentiality of data throughout the study was guaranteed and the included patients were assured that data will be used for research purpose only.

Funding: Self-funding

References


Role of Endoscopic Ultrasound Guided Fine Needle Aspirate for Evaluating Lesions in or Adjacent to Gastrointestinal Tract: A Single Tertiary Care Center Experience

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Abstract

Background: Endoscopic ultrasonography guided-fine needle aspiration offers through linear endoscopy an opportunity for sampling mediastinal, intra-abdominal, pancreatic and pelvic lesions under direct visualization.

Aim of Study: To assess the validity of endoscopic ultrasonography guided-fine needle aspiration from patients with gastrointestinal tract disorder discovered by endoscopy or other imaging modalities in comparison to histopathology.

Patients and Method: A retrospective data review study conducted in Kurdistan Center for Gastroenterology & Hepatology in Sulaimani through the period from 1st of January 2016 to 31st of December 2016 on sample of 102 suspected gastrointestinal tumors patients. Endoscopic ultrasonography data base at Kurdistan Center during 4 years period (January 2013- December 2016) is searched for all patients referred for Endoscopic ultrasonography-fine needle aspiration.

Results: Endoscopic ultrasonography showed that 51% of suspected gastrointestinal tumor patients had malignancy while histopathology showed that 45.1% of suspected patients had malignancy. The validity results of endoscopic ultrasonography-fine needle aspiration in comparison to histopathology findings were sensitivity (87%), specificity (78.6%), +ve predictive value (76.9%), -ve predictive value (88%) and accuracy (82.3%).

Conclusions: Endoscopic Ultrasonography-Fine Needle Aspiration is an appropriate diagnostic choice for suspected gastrointestinal tumors.

Keywords: Endoscopic ultrasonography guided-fine needle aspiration, Histopathology, Gastrointestinal tumors.

Introduction

The endoscopic ultrasonography-guided fine needle aspiration (EUS-FNA) facilitates the chance for acquiring samples for mediastinal, intra-abdominal and pancreatic lesions through direct vision¹². The EUS-FNA is beneficial for collecting cytological materials, so had an accurate diagnosis for many suspected clinical lesions ranging from 52-94% ³⁴. However, the histopathology examination has an important role in improving the diagnostic yield⁵.

Many clinical roles are reported for EUS-FNA which daily increased with advancement of oncology.
and molecular genetics. The EUS-FNA is useful in gastrointestinal (GIT) tumors staging, treatment and prognosis. The first clinical indications of EUS-FNA are sampling of nodes in different GIT tumors like esophageal carcinoma, mediastinal lymphnodes and tumors, pancreatic masses, etc. The EUS-FNA has a significant role in the differential diagnosis of solid pancreatic tumors. The EUS-FNA is contraindicated in cases when there is a suspicion of affecting cancer treatment. Additional contraindications of EUS-FNA are like other endoscopic procedures which are severe hemorrhage and thrombocytopenia, or risk of tumor seeding and blood vessels in way of endoscopy.

The main complication of EUS-FNA as recorded by the European Society of Gastrointestinal Endoscopy (ESGE) guidelines was acute pancreatitis with incidence range of 0.26-2%. However, the ESGE guidelines stated that EUS-FNA is a safe procedure with a low rate of general complications (incidence rate 1%) that increased in cystic lesions as compared to solid lesions. Many authors reported lower rates of EUS-FNA severe complications like bleeding, perforation and death. Seeding of tumors related to EUS-FNA for pancreatic adenocarcinoma is rare. The EUS-FNA in comparison to percutaneous route, has a great advantage of lower risk of peritoneal seeding.

The increase in GIT cancer rates globally and nationally in last decades which was related to dietary and lifestyle changes in addition to medical advances in diagnosis, staging, treatment and prognosis of GIT cancers in Iraq are the main rationale for present study. The objective of this study was to assess the validity of EUS-FNA from patients with gastrointestinal tract disorder discovered by endoscopy or other imaging modalities in comparison to histopathology examination.

**Methodology**

The design of current study was retrospective data review study conducted in Kurdistan Center for Gastroenterology & Hepatology (KCGH) in Sulaimani city-Iraq through the period from 1st of January 2016 to 31st of December 2016. Study population was patients with suspected gastrointestinal tract lesion by endoscopy or imaging study referred to KCGH center for EUS-FNA for further evaluation of the lesion. Patients with suspected gastrointestinal tract lesion by endoscopy or imaging study with adulthood age group (≥28 years) and completed data specifically the EUS-FNA and histopathology were the inclusion criteria. The exclusion criteria were known cases of other tumors, incomplete data and younger age patients. A sample of 102 suspected gastrointestinal (GIT) tumor patients referred to KCGH in Sulaimani criteria was taken. The ethical considerations were obtained from Helsinki Declaration by respecting confidentiality of patients, approval on study was acquired from KCGH authority and the researcher was responsible about the saved data.

The data were collected by the researcher through review of patients’ files and fulfilling a prepared questionnaire. Diagnosis was made on the basis of history, examination, investigations, imaging and histopathology. Investigations (like complete blood picture, liver function tests, CA19-9, HbA1c, renal function tests, Virology, etc.) imaging (like transabdominal ultrasonography, magnetic resonance imaging, computerized tomography scan and magnetic resonance cholangiopancreatography) and histopathology were carried out in KCGH. Interpretation of these investigations was done by Gastroenterologist and Radiologist. The questionnaire included the followings: demographic characteristics (age and gender), EUS-FNA characteristics (needle size, number of passes and technique of sampling, EUS findings and histopathology findings.

The EUS data base at KCGH center during 4 years period (January 2013- December 2016) is searched for all patients referred for EUS-FNA. The model is Pentax Videoscope EG3870UTK and Hitashi Avius Doppler Ultrasound (done by 3 gastroenterologists). Cytology was done in Kurdistan center of gastroenterology and hepatology (GIT expert pathologist). The needles used for EUS-FNA had size ranged between 19-25 G. The passes numbers of EUS-FNA were ranging between 1-4 passes. All the biopsies and surgical specimens were fixed with Formalin and alcohol to be prepared for examination. The slides were stained with eosin, hematoxlin and immunohistochemical substances.

The data collected were analyzed statistically by Statistical Package of Social Sciences software version 22. Chi-square test and Fischer’s exact test were applied for analyzing the data as suitable. Two by two table was applied for calculation of validity findings of EUS-FNA in comparison to Histopathology. Level of significance (p value) was regarded statistically significant if it was 0.05 or less.
Results

Most (94.1%) of EUS-FNA needles had size of 22G and more than two thirds (78.4%) of patients had two needle passes. All these findings were shown in table 1.

Table 1: EUS-FNA characteristics.

<table>
<thead>
<tr>
<th>Variable</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUS-FNA needle size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>22</td>
<td>96</td>
<td>94.1</td>
</tr>
<tr>
<td>25</td>
<td>4</td>
<td>3.9</td>
</tr>
<tr>
<td>Total</td>
<td>102</td>
<td>100.0</td>
</tr>
<tr>
<td>Passes number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>15</td>
<td>14.7</td>
</tr>
<tr>
<td>2</td>
<td>80</td>
<td>78.4</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>5.9</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Total</td>
<td>102</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The common EUS findings were unresectable pancreatic head tumor (8.8%), neuro-endocrine tumors (6.9%), pancreatic genu mass (4.9%), Portahepatis (4.9%), mediastinal LAP (4.9%), etc. All these findings were shown in table 2.

EUS showed that 51% of suspected GIT tumor patients had malignancy while histopathology showed that 45.1% of suspected GIT patients had malignancy. All these findings were shown in figures 1 and 2.

Table 2: EUS findings of suspected GIT tumor patients.

<table>
<thead>
<tr>
<th>Variable</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUS-FNA findings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unresectable pancreatic head tumor</td>
<td>9</td>
<td>8.8</td>
</tr>
<tr>
<td>Neuro-endocrine tumors</td>
<td>7</td>
<td>6.9</td>
</tr>
<tr>
<td>Pancreatic genu mass</td>
<td>5</td>
<td>4.9</td>
</tr>
<tr>
<td>Portahepatis</td>
<td>5</td>
<td>4.9</td>
</tr>
<tr>
<td>Mediastinal LAP</td>
<td>5</td>
<td>4.9</td>
</tr>
<tr>
<td>Benign biliary stricture</td>
<td>5</td>
<td>4.9</td>
</tr>
<tr>
<td>Pancreatic tail unilocular cyst</td>
<td>4</td>
<td>3.9</td>
</tr>
<tr>
<td>Abscess</td>
<td>4</td>
<td>3.9</td>
</tr>
<tr>
<td>Periampullary tumor</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td>Multiloculated pancreatic cyst</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td>GIST</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td>Gall bladder tumor</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td>Locally invasive gastric CA</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td>Pancreatic body tumor &amp; LAP</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td>Gall bladder microlithiasis</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Unresectable pancreatic tail tumor</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Pancreatic head cyst</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Oligocystic pancreatic lesion</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Unresectablebronchlear tumor</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Localized lower oesophageal tumor</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Pancreatic body pseudocyst</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Hypoechoic mass between pancrease and stomach</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Thickening of gastric pylorus</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Large subcarinallymh node</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Para-esophageal lesion</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Others</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>102</td>
<td>100.0</td>
</tr>
</tbody>
</table>
There was a significant association between increased age of suspected GIT tumor patients and malignancy finding of cytopathology (p=0.002). A highly significant association was observed between male suspected GIT tumor patients and malignancy finding of cytopathology (p=0.04). All these findings were shown in table 3.
Table 3: Distribution of demographic characteristics of GIT tumor patients according to histopathology findings.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Malignancy</th>
<th>No malignancy</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%)</td>
<td>No. (%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.002*</td>
</tr>
<tr>
<td>Age (Year)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;40</td>
<td>0</td>
<td>15</td>
<td>26.8</td>
</tr>
<tr>
<td>40-49</td>
<td>4</td>
<td>7</td>
<td>12.5</td>
</tr>
<tr>
<td>50-59</td>
<td>9</td>
<td>10</td>
<td>17.9</td>
</tr>
<tr>
<td>60-69</td>
<td>19</td>
<td>15</td>
<td>26.8</td>
</tr>
<tr>
<td>≥70</td>
<td>14</td>
<td>9</td>
<td>16.1</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td>0.04*</td>
</tr>
<tr>
<td>Male</td>
<td>28</td>
<td>23</td>
<td>41.1</td>
</tr>
<tr>
<td>Female</td>
<td>18</td>
<td>33</td>
<td>58.9</td>
</tr>
</tbody>
</table>

*Significant.

A highly significant association was observed between malignancy detected by EUS and malignancy finding of histopathology (p<0.001). The validity results of EUS-FNA in comparison to cytopathology findings were sensitivity (87%), specificity (78.6%), +ve predictive value (76.9%), -ve predictive value (88%) and accuracy (82.3%). All these findings were shown in table 4.

Table 4: Validity test results of EUS findings in comparison to cytopathology findings.

<table>
<thead>
<tr>
<th>Validity test</th>
<th>Malignancy</th>
<th>No malignancy</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%)</td>
<td>No. (%)</td>
<td>No. (%)</td>
</tr>
<tr>
<td>EUS Malignancy</td>
<td>40 (87.0)</td>
<td>12 (21.4)</td>
<td>52 (100.0)</td>
</tr>
<tr>
<td>No malignancy</td>
<td>6 (13.0)</td>
<td>44 (78.6)</td>
<td>50 (100.0)</td>
</tr>
<tr>
<td>Total</td>
<td>46 (45.0)</td>
<td>56 (55.0)</td>
<td>102 (100.0)</td>
</tr>
</tbody>
</table>

Sensitivity: 87%
Specificity: 78.6%
+ve predictive value: 76.9%
-ve predictive value: 88%
Accuracy: 82.3%

P < 0.001 (Highly significant)

**Discussion**

Early detection of gastrointestinal tumors is important in lives saving as dangerous GIT tumors are asymptomatic. For that, many imaging modalities were developed for screening and early diagnosis with best localization of GIT lesions

Present study showed that the validity results of EUS-FNA in diagnosing malignancy of GIT are sensitivity (87%), specificity (78.6%), positive predictive value (76.9%), negative predictive value (88%) and accuracy (82.3%). These findings are close to results of previous Iraqi study included 40 patients with pancreatic
mass and reported EUS-FNA sensitivity is 80.9% in diagnosing malignancy of pancreas. Validity results of EUS-FNA by our study were higher than results of Baek et al study in South Korea which was a retrospective review of 191 cases of pancreatic lesions initially diagnosed by EUS-FNA and reported that EUS-FNA diagnostic accuracy was 78.4%, sensitivity was 79.2% and specificity was 75.7%. The positive predictive value was 92.0% and negative predictive value was 50.9%. However, our EUS-FNA validity results were lower than results of Baghbanian et al study in Iran which stated that EUS-FNA sensitivity, specificity, positive predictive value, negative predictive value and accuracy of this procedure concerning malignancy of GIT were 88%, 100%, 100%, 70% and 90%, respectively. These differences in EUS-FNA validity results between studies might be attributed to difference in sample size and study designs in addition to different inclusion criteria. In spite these differences, all studies pointed to good accuracy of EUS-FNA for diagnosing malignant GIT tumor.

Despite of this acceptable accuracy for EUS-FNA, there is a debate on importance of sampling for pancreatic lesions, specifically for those who are with surgically resectable lesion. The reason was that EUS-FNA could be restrained by the stenosis or other anatomical factors and EUS validity decreased with chronic pancreatitis in addition to complications of needle tract seeding. However, the EUS-FNA helps in excluding other types of tumors, helpful in surgical planning and in diagnosis confirmation. EUS-FNA sensitivity and specificity is directly related to pathologist’s experience and endosonographist’s skills.

In our study, there was a significant association between increased age of suspected GIT tumor patients and malignancy (p=0.002). This is similar to results of McCleary et al study in USA which showed that GIT malignant tumors were more prevalent among elderly population (>70 years age). Present study showed that male gender was significantly associated with malignant GIT tumors (p=0.04). This finding coincides with results of Thakur et al study in India which showed a male preponderance for all sites in the gastrointestinal tract with 34 (64.0%) male patients and 19 (36.0%) female patients.

In conclusion, Endoscopic Ultrasonography-Fine Needle Aspiration is an appropriate diagnostic choice for suspected gastrointestinal tumors. Elderly age and male gender are more likely to predict malignancy of gastrointestinal tract. Encouraging Physicians and gastroenterologist to use the Endoscopic Ultrasonography-Fine Needle Aspiration as first choice in diagnosing gastrointestinal suspected lesions is the main recommendation.

Acknowledgment: Special thanks and appreciation for all medical workers in Kurdistan Center for Gastroenterology & Hepatology (KCGH) in Sulaimani city-Iraq for their support.

Conflict of Interest: Non

Source of Findings: Self findings.

Ethical Clearance: Non

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Level of Knowledge and Awareness of Halitosis in the Dental Medicine Students

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¹Undergraduate Student of Dental Medicine, Department Dental Public Health, Faculty of Dental Medicine, Universitas Airlangga Indonesia, ²Primary Health Care Research group, Faculty of Dental Medicine, Universitas Airlangga Indonesia

Abstract

Background: Halitosis is a general term that means bad odor in the oral cavity that is difficult to treat due to poor oral health and is a problem affecting 50% of the adult population. The impact of halitosis is closely related to the psychological and social effects of a person.

Purpose: To find out the level of knowledge and awareness of Dental Medicine Students of Universitas Airlangga about halitosis and the benefits of the perception and level of awareness of halitosis as a reference in carrying out health promotion.

Method: This research will use a cross-sectional random sampling study. The survey or questionnaire was distributed to 100 students from class of 2014 to 2019 Faculty of Dental Medicine, Universitas Airlangga, Surabaya, Indonesia.

Result: The results of this study show that the level of halitosis knowledge in pre-clinic students shows that 57% had proper knowledge and 43% had poor knowledge. While clinical students have a 46% poor knowledge result and 54% with proper knowledge. For the awareness of halitosis in pre-clinic students shows that 91% had a proper awareness and only 9% with poor awareness.

Conclusion: The average score of the respondents on poor knowledge of halitosis and poor awareness of halitosis, so health promotion that will be carried out can be emphasized on counseling about halitosis.

Keyword: Halitosis, Psychological and Social impacts, Knowledge about Halitosis.

Introduction

Halitosis is a general term that means bad odor in the oral cavity that is difficult to disappear due to poor oral health¹. Halitosis comes from the Latin word “halitus” meaning breath and the Greek word “osis” which means abnormal or disease. Halitosis is a term for defining bad odor from breathing. The unpleasant odor caused by the release of Volatile Sulfur Compounds (VSCs) caused by the decay activity of gram-negative microorganisms². Halitosis can be divided into 3 types, namely true halitosis, pseudohalitosis and halitophobia³.

The cause of halitosis is still unknown, but most of the causes are food scraps left in the oral cavity which are then processed by the oral flora⁴. Of particular concern are saliva, tongue, interdental areas and teeth⁵,⁶. In addition, halitosis can also be caused by abnormalities in the oral cavity or systemic abnormalities or abnormalities in the extraoral⁷. Common causes of halitosis (more than 80%) are stomatological disorders such as calculus⁸, chronic...
gingivitis, periodontitis, poor oral hygiene, stomatitis caused by bacteria and fungi, inflammation of the mucous membranes and bones, tumors, etc. Other disorders that can also trigger halitosis are open pulp teeth, post extraction sores, dentures that are rarely removed and cleaned, cysts, oral cancer and food impaction.

The impact of halitosis is closely related to the psychological and social effects of a person. Unpleasant breath during communication can be an influence on a person’s social life and psychological health. Bad breath can also cause phobias, depression, excessive worries, behavior changes and can affect self-confidence. The social impact of halitosis has been studied in other studies where women tend to be ashamed of halitosis. More and more women feel that they cannot reach their academic goals because of bad breath. Women are more aware of their bad breath. The use of oral hygiene aids greatly influences individual social behavior and is very important for individuals who face insecurities about their bad breath in social interactions. In preventing halitosis, an individual’s knowledge and awareness of halitosis is needed.

Knowledge is the result of knowing obtained by humans by sensing an object. Knowledge becomes the main domain for the creation of human behavior. While awareness is a form of someone’s readiness to face all forms of surrounding events and cognitive events including memory, thoughts, feelings and physical. Both of these are interrelated and play an important role in preventing halitosis. Therefore, in this study the authors wanted to know the knowledge and awareness of halitosis in the community with samples taken from students of the Faculty of Dental Medicine, Universitas Airlangga. The data can then be used to develop a health promotion program on halitosis.

Material and Method

In this study a descriptive cross-sectional study method was used and the sample was taken randomly. This study was approved by the ethics commission of the Faculty of Dental Medicine, Universitas Airlangga. The subjects and locations used for this study were 100 Dental Medicine students at Universitas Airlangga in Surabaya from the class of 2014 to the class of 2019 (Preclinical and clinical students). The research instrument used to collect data in the form of questionnaires. Questionnaires are data collection techniques carried out by giving a set of questions or statements to other people who are subject to answer. The questions that will be used in this study are questions from a journal that had previously been made by Mubayrik and made several changes. Questions were shared using Google Form and filling was done in private and each sample filled in individually. The question format provided contains 3 pages consisting of identity data and informed consent, questions about self-awareness about halitosis and the last page contains questions about knowledge about halitosis. Total questions provided are 13 questions. The research variables seen in this study are knowledge about halitosis and awareness of halitosis.

Result

<table>
<thead>
<tr>
<th>Cases</th>
<th>Valid N</th>
<th>Valid Percent</th>
<th>Missing N</th>
<th>Missing Percent</th>
<th>Total N</th>
<th>Total Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self_Evaluation_of_Halitosis* Sex</td>
<td>100</td>
<td>100.0%</td>
<td>0</td>
<td>0.0%</td>
<td>100</td>
<td>100.0%</td>
</tr>
<tr>
<td>Self_Evaluation_of_Halitosis* Education</td>
<td>100</td>
<td>100.0%</td>
<td>0</td>
<td>0.0%</td>
<td>100</td>
<td>100.0%</td>
</tr>
<tr>
<td>Knowledge_About_Halitosis* Sex</td>
<td>100</td>
<td>100.0%</td>
<td>0</td>
<td>0.0%</td>
<td>100</td>
<td>100.0%</td>
</tr>
<tr>
<td>Knowledge_About_Halitosis* Education</td>
<td>100</td>
<td>100.0%</td>
<td>0</td>
<td>0.0%</td>
<td>100</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Table II: Research Results

<table>
<thead>
<tr>
<th></th>
<th>Self_Evaluation_of_Halitosis</th>
<th>Knowledge_about_Halitosis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Proper</td>
</tr>
<tr>
<td>Pre-Clinic</td>
<td>8</td>
<td>91%</td>
</tr>
<tr>
<td>Clinic</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>10%</td>
</tr>
<tr>
<td>Men</td>
<td>2</td>
<td>8%</td>
</tr>
<tr>
<td>Women</td>
<td>8</td>
<td>11%</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>10%</td>
</tr>
</tbody>
</table>

In table 1, it can be seen the results of the questionnaire that has been summarized and analyzed. In the questionnaire, questions about self-evaluation of halitosis range or awareness of halitosis are represented by 4 questions which include how to evaluate halitosis in yourself, how to confirm the diagnosis of halitosis, how to cope with halitosis according to individual views and what action will be taken for acquaintances who experience halitosis. The questions are available in multiple choices from a through d and whoever answer a will be graded by 3 and whoever answer d will be scored 0. Individual scores of more than 7 will be rated proper and less than 7 will be judged poorly. After analyzing the data, the results of pre-clinical students who have proper awareness about halitosis by 91% and clinical students by 85% and overall respondents 90% have proper awareness of halitosis. Furthermore, for the variable knowledge about individual halitosis with scores 9 to 14 are considered proper and less than 8 means poor knowledge about halitosis. The results of pre-clinical students with proper knowledge by 57% and clinical students who have good knowledge by 54%. The presentation of the knowledge of Dental Medicine students of Universitas Airlangga to halitosis shows that 57% had a proper knowledge and the rest was poor or lack of knowledge. After testing the two variables, the authors also compared sex to awareness and knowledge of halitosis. The percentage of individual awareness of halitosis was higher in men at 92% while in women at 89%. This is contrary to students knowledge, women have better presentations of 64% and men by 38%.

Discussion

The results of the first part of the research about Halitosis Knowledge of Pre-Clinical and Clinical Students shows that the level of halitosis knowledge in pre-clinical students with poor knowledge is 43% and 57% had a proper knowledge. While clinical students have a 46% bad knowledge result and 54% proper knowledge. With the results of this study it was found that the level of knowledge of clinical students is lower than pre-clinic students. This means that it is not in accordance with the hypothesis that clinical students should have more and better knowledge about halitosis.

The results of this study are based on literature by Cassiano Kuchenbecker Rösing & Walter Loesche22, who stated that everyone in the field of dentistry should pay more particular attention to halitosis. However, the science behind understanding halitosis is still low. Some clinical approaches are based on opinion. As a dentist must have knowledge about current halitosis, diagnosis and treatment modalities to meet the needs of patients either consciously or knowledgeably with this problem. According to the results of Cameira N.J15’s research, students showed a lack of proper knowledge about halitosis and reported an inadequate level of education on the subject, which was inconsistent with the results of our study. In general, providing knowledge about halitosis is very important because it can be a manifestation of several diseases. Therefore early diagnosis seems to be a must. Conducting scientific publications and clinical guidance on this issue may be very helpful to health practitioners.

Knowing that majority of causes of halitosis are oral based, dentists must become primary health professionals in screening and managing halitosis in patients who complain about the disease. Poor education can lead to a lack of confidence by dental professionals and an unsatisfactory response to patient needs23. On the other hand, this problem is an obligation for a dentist to identify and develop knowledge in the field of dentistry.
to provide balanced scientific information to patients and to increase the knowledge of dentistry students. Halitosis is a recognizable disease that requires professional attention. To overcome this, dental schools must commit to give their students a strong emphasis on this condition. A self-evaluation check might be a starting point for a change. Furthermore, the results of the second part of research about Halitosis Awareness in Pre-Clinical and Clinical Students shows that 91% of the pre-clinical students had a proper awareness and only 9% had a poor awareness. While clinical students had a poor knowledge result of 15% and proper knowledge of 85%. With the results of this study it was found that the level of awareness of clinical students is lower than pre-clinical students. Based on Mubayrik A. study, found a relatively low level of self-reported halitosis awareness, but a much larger proportion indicates that bad breath is a problem for people around them. Most respondents indicated that they would overcome bad breath by covering up rather than treating the cause.

The results obtained are not in accordance with the hypothesis where it is expected that clinical students have a higher awareness than preclinical students. As in previous studies which showed that the first, second, third and fourth grade students experienced a significant increase in awareness of halitosis. This is comparable to the experience and education training of dental students who are getting more and more experienced on this field.

In the results of the third part of research about Halitosis Knowledge in Female and Male Students shows that the level of halitosis knowledge in female students with bad knowledge is 36% and proper knowledge is 64%. While male students have a poor knowledge result of 62% and poor knowledge of 38%. With the results of this study found that the level of knowledge of male students is lower than female students.

The results of the fourth part of the research about Halitosis Awareness in Female and Male Students showed that the level of halitosis awareness in female students had a result of 11% with poor awareness and 89% with proper awareness. While male students had 8% with poor awareness and 92% with proper awareness. With the results of this study it was found that the level of awareness of male students was lower than that of female students. The results of the above study in accordance with previous studies stated that female students had an awareness to maintain teeth and oral health better than male students. This could happen because women prefer to use dental floss and mouth wash than men. Some supporting factors include the fact that women take more care and attention of their body and appearance compared to men.

**Conclusion**

Our results show that the evaluation rate and awareness of the Unair Dental Medicine students about bad breath or halitosis is fairly good, with an average score of respondents towards poor knowledge of halitosis by 43% and proper knowledge by 57% and on the results for evaluating awareness of halitosis, the result of poor awareness of halitosis is 10% and those who have proper awareness are 90%. The evaluation obtained in this study where there is a large gap from the comparison of male and female students who are in the Faculty of Dental Medicine of Universitas Airlangga and there is an uneven distribution between pre-clinical and clinical students, causing a large enough comparation.

**Conflict of Interest:** There are no conflicts of interest.

**Source of Funding:** Self-Funding

**Ethical Clearance:** Approved

**References**


Awareness and Performance of Paramedics in Preventing toward Middle East Respiratory Syndrome Coronavirus Infection

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Abstract

The purpose of this study is to examine the knowledge of Middle East Respiratory Syndrome Coronavirus (MERS), wearing of protective equipment and the performance in preventing MERS infection among paramedics and analyze correlations. The survey was conducted on 96 active paramedics in K city, South Korea. The data were analyzed using the SPSS 21.0 program using descriptive statistics, t-test, one-way ANOVA, Scheffe test and Pearson’s correlation coefficient.

Through this analysis, it was found that higher knowledge of MERS resulted in higher scores in the actions to prevent infection. As such, it is necessary to raise the infection control performance of paramedics by reflecting strategies for ‘preparedness’ rather than ‘response’ in the training on MERS, which must focus on knowledge and infection prevention.

Keywords: Paramedics, MERS-coronavirus, knowledge, protective equipment, infection prevention.

Introduction

Middle East respiratory syndrome is a severe acute respiratory infection caused by the MERS⁰¹. Since the first confirmed case was reported in Saudi Arabia in 2012, cases have been reported around the world and the death toll has been steadily increasing⁰². In fact, it continues to occur in Korea, as there was a suspected case of MERS in September 2018⁰³. Similar to SARS, which hit Asia in 2003, there is still no cure or vaccine for the disease, which is accompanied by kidney failure along with symptoms of severe acute respiratory diseases such as high fever, coughing and difficulty in breathing⁰⁴.

Looking back at the outbreak of MERS in Korea in 2015, the system overseeing each component of the emergency medical system did not function properly during the outbreak and spread of MERS⁰⁴. This is because essential guidelines were missing and even the guidelines available were difficult to apply in the field⁰⁵. In addition, the infections were concentrated in medical environments and were highly prevalent among health and medical care workers⁰⁶. In particular, as paramedics have the most direct contact with active patients with infectious diseases before hospital treatment, they can be exposed to infectious diseases through contact with patients⁰⁷. For this reason, paramedics need to perform effective infection control actions to minimize their infections related to emergency medical care. In addition, they must conduct activities to prevent the spread of microorganisms in order to prevent exogenous healthcare-associated infections⁰⁸. Actions to prevent infection include hand hygiene, personal hygiene and
aseptic technique, invasive instrument management, wearing and removing protective equipment, disinfection and sterilization, quarantine and environmental management activities performed by paramedics.

Monitoring and reporting the outbreak of infections are the starting point and backbone of infection control projects and these projects can be properly carried out by accurately identifying infection control problems inherent to paramedics. In addition, effective infection control can be achieved by monitoring the measures taken to address the problems and the results of education through continuous infection monitoring activities. However, there is a lack of research and education on infection control for paramedics. Although the safety management SOP (Standard Operating Procedures) standard for paramedics has been prepared and enacted to protect paramedics from infections and the importance of paramedic safety is being emphasized, studies in Korea on infection control by paramedics before hospital treatment have only been performed by Yoon and Jung. As such, it is necessary to present the proper direction for infection control based on the reality of paramedics in Korea.

Therefore, the purpose of this study is to provide a basic data on infection control by examining the relationship between the knowledge of MERS, wearing protective equipment and the performance level of infection prevention for paramedics who are susceptible to infections at emergency sites.

Method

Study Participants and Data Collection: The participants in this study were selected from those who understood its purpose and objective and agreed to voluntarily participate in the study among active firefighting officers who entered the fire academy in K-area for retraining. To protect the participants, approval for this study was obtained from the university’s bioethics review committee. We explained to the participants that the data will be only used for research in addition to their contribution to the research and the details and method of research. We also informed them that they could withdraw from the study and explained the anonymity and confidentiality of the data and that all data will be destroyed after the study. We considered the ethical aspect for the participants by receiving written consent to participate in the study. We distributed 100 questionnaires considering the recovery rate and collected 96 questionnaires for the final analysis.

Research Variables: Korean tools to measure the performance of MERS knowledge and actions to prevent infection have not yet been developed and the infection control protocol in Korea clinically applies the protocol developed by the Centers for Disease Control and Prevention (CDC). Therefore, this study developed a questionnaire on MERS knowledge, wearing protective equipment and infection prevention performance after consulting with a licensed professor of emergency medicine based on the infection control guidelines for paramedics, materials presented by the Korea Centers for Disease Control and Prevention, training materials for Korean paramedics to prevent MERS infection and MERS response integrated administrative guidelines.

The questionnaire has a total of 30 yes/no questions, including 10 questions about knowledge, 5 questions for protective equipment and 15 questions for infection prevention performance.

Data analysis: The data collected in this study were analyzed using the SPSS 21.0 program descriptive statistics, t-test, one-way ANOVA, Scheffe test and Pearson’s correlation coefficient.

Result and Discussion

General Characteristics: The general characteristics of the paramedics are shown in Table 1 below. Out of 96 paramedics, 84 (87.5%) were male and 12 (12.5%) were female, so there about 3 times more male paramedics than female paramedics. In terms of age, 53 paramedics were under 29 (55.2%) and 43 were over 30 years old (44.8%). In terms of education, the paramedics consisted of 8 high-school graduates (8.3%), 36 university graduates (37.5%) and 52 college graduates (54.2%).

Performance of wearing protective equipment: The participants’ performance of wearing protective equipment against MERS is shown in Table 3. The items with the highest performance level were 95.8% for ‘wear N95 masks’ and ‘wear gloves,’ while the item with the lowest performance level was 91.7% for ‘wear gowns (protective coveralls) that cover the sleeves.’ The use of protective equipment is the last defense to prevent harmful factors from entering the human body and here the average performance rate was high, at 93.7%.

Knowledge of MERS, wearing protective equipment and preventing infection according to general characteristics: The differences in knowledge of MERS, wearing protective equipment and preventing
infection according to the general characteristics of the paramedics are shown in <Table 3>. There were no differences according to gender, age and educational background. There was a statistically significant difference in wearing protective equipment according to the position or rank ($F=3.621, \ p<.031$) and the post-analysis showed that fire captains scored higher than fire fighters.

**Relationship between Variables:** The correlations between the participants’ knowledge of MERS, wearing protective equipment and preventing infection are shown in <Table 4>. The higher the knowledge of MERS, the higher the score for actions to prevent infection ($r=.216, \ p<.034$).

The MERS outbreak is a historical event which brought about a paradigm shift in Korea’s national infectious disease prevention and response system$^9$. The outbreak of MERS was prevalent in medical institutions and between humans$^4$. In Korea, the spread of the MERS outbreak was attributed to a complex interplay of various individual factors including the lack of awareness by medical professionals, the culture of family nursing, the health care delivery system and the initial response system of the government. We will not be able to achieve the desired results when faced with a complicated crisis such as MERS with conventional medical knowledge alone. Therefore, the first step in building an effective infection prevention system against infectious diseases such as MERS is to enhance the awareness and related knowledge through education in infection control guidelines based on the requirements of occupational roles and responsibilities, such as paramedics who experience direct contact with patients$^{15}$.

In addition, in order to be able to operate an effective infection prevention system in the event of a pandemic, regardless of the prevalence of MERS epidemic, it is necessary to develop an effective educational program for specific guidelines in all areas regarding the prevention and management of radio waves and to introduce and apply it in paramedics practice$^{16}$. For example, measures should be developed to effectively train workers in MERS quarantine guidelines by implementing simulation-based training for MERS outbreak and regular training for wearing protective equipment, case management for MERS management according to MERS quarantine guidelines regularly updated by the Korea Centers for Disease Control$^{17}$. These changes are essential for the education of occupational groups in direct contact with patients by preparing strategies related to preparedness rather than response.

The limitations of this study include it having a design, possible reporting bias and being conducted in a single city in Korea with a small sample size limited to a single profession. Based on the results of this study, the following suggestions are made. Since the results of this study are limited to the paramedics in Korea, follow-up research should be conducted in other countries to allow for greater comparison.

**Table 1. Subjects’ General Characteristics (N=96)**

<table>
<thead>
<tr>
<th>General characteristics</th>
<th>Sort</th>
<th>Number of people</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>84</td>
<td>87.5</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>12</td>
<td>12.5</td>
</tr>
<tr>
<td>Age</td>
<td>≤ 29</td>
<td>53</td>
<td>55.2</td>
</tr>
<tr>
<td></td>
<td>≥ 30</td>
<td>43</td>
<td>44.8</td>
</tr>
<tr>
<td>Education</td>
<td>High-school graduate</td>
<td>8</td>
<td>8.3</td>
</tr>
<tr>
<td></td>
<td>College graduate</td>
<td>52</td>
<td>54.2</td>
</tr>
<tr>
<td></td>
<td>University graduate</td>
<td>36</td>
<td>37.5</td>
</tr>
</tbody>
</table>
Table 2. Performance of wearing MERS protective equipment (N=96)

<table>
<thead>
<tr>
<th>Question</th>
<th>Performance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear N95 masks</td>
<td>95.8</td>
</tr>
<tr>
<td>Wear gloves</td>
<td>95.8</td>
</tr>
<tr>
<td>Wear gowns (protective coveralls) that cover the sleeves</td>
<td>91.7</td>
</tr>
<tr>
<td>If necessary, wear goggles (when suspected patients cough, etc.)</td>
<td>92.7</td>
</tr>
<tr>
<td>If necessary, wear face masks (when suspected patients cough, etc.)</td>
<td>92.7</td>
</tr>
<tr>
<td>Total</td>
<td>93.7</td>
</tr>
</tbody>
</table>

Table 3. Knowledge of MERS, wearing protective equipment and preventing infection according to the general characteristics (N=96)

<table>
<thead>
<tr>
<th>General characteristics</th>
<th>Type</th>
<th>Knowledge</th>
<th>Wearing protective equipment</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M±SD</td>
<td>t/F(p)</td>
<td>M±SD</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>10.95±1.18</td>
<td>.331 (.741)</td>
<td>15.29±0.67</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>10.83±1.03</td>
<td></td>
<td>15.17±0.58</td>
</tr>
<tr>
<td>Age</td>
<td>Under 29</td>
<td>9.23±6.46</td>
<td>-1.090 (.277)</td>
<td>60.70±6.78</td>
</tr>
<tr>
<td></td>
<td>Over 30</td>
<td>9.69±1.74</td>
<td></td>
<td>60.02±6.02</td>
</tr>
<tr>
<td>Education</td>
<td>High-school graduate</td>
<td>11.50±1.07</td>
<td>2.555 (.083)</td>
<td>15.63±1.41</td>
</tr>
<tr>
<td></td>
<td>College graduate</td>
<td>10.71±1.11</td>
<td></td>
<td>15.23±0.58</td>
</tr>
<tr>
<td></td>
<td>University graduate</td>
<td>11.14±1.20</td>
<td></td>
<td>15.25±0.50</td>
</tr>
<tr>
<td>Position (Rank)</td>
<td>Fire fighters</td>
<td>11.00±1.12</td>
<td>.603 (.550)</td>
<td>15.21±0.50</td>
</tr>
<tr>
<td></td>
<td>Above fire captain</td>
<td>11.50±0.71</td>
<td></td>
<td>16.50±0.71</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>10.80±1.10</td>
<td></td>
<td>15.27±0.72</td>
</tr>
</tbody>
</table>

Table 4. Relationship between the knowledge of MERS, wearing protective equipment and preventing infection (N=96)

<table>
<thead>
<tr>
<th>Category</th>
<th>Knowledge r (p)</th>
<th>Actions to prevent infection r (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preventing infection</td>
<td>.216 (.034)</td>
<td></td>
</tr>
<tr>
<td>Wearing protective equipment</td>
<td>.063 (.543)</td>
<td>-.021 (.837)</td>
</tr>
</tbody>
</table>

*p < .05

Conclusion

Our study shows that as paramedics have more knowledge of MERS, they had higher scores for preventing infection. Therefore, it is necessary to build an effective infection prevention system for infectious diseases by reflecting our knowledge of MERS and specific details on preventing infection in the education for occupational groups in direct contact with patients.

Ethical Clearance: Taken from Gwangju Women’s University.

Source of Funding: Self

Conflict of Interest: NA

Reference


Lemon Extract as an Alternative Etching Materials on Composite Resin Restoration Against Shear Strength

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Abstract

Background: Composite restoration is an adhesive (mechanical interlocking) restoration, which is from resin tags on micro porosity on the etched surface of the enamel. Etching is to clean the smear layer and forming porous on the enamel surface as to provide mechanical retention in the restoration. The acidic etching material that is often used is phosphoric acid with a concentration of 37%, but 37% phosphoric acid can cause inflammatory cell infiltration. Lemon contains citric acid, a weak acid that has the potential to be an alternative to acid etching.

Purpose: To find out the effect of lemon extract as an alternative etching material on the shear strength of composite resin.

Method: 14 samples of bovine teeth incisors were divided into two groups. Each group consisted of 7 samples, then cavity preparation. Group 1 with 37% phosphoric acid etching, group 2 with lemon extract. The samples were bonded, filled with composite resin and carried out shear strength tests.

Results: There was no significant difference in shear strength from the composite resin group with 37% phosphoric acid etching and composite resin group with lemon extract.

Conclusion: Lemon extract can be used as an alternative material for acid etching in composite resin.

Keywords: Shear strength, lemon extract, 37% phosphoric acid etching and composite resin.

Introduction

Recently, the field of dental medicine, composite resins have begun to be widely used as anterior and posterior restorative materials, due to the demand of patients who want tooth-colored restoration1. Composite resins are increasingly popular because they have good aesthetics and good mechanical strength, among others are not easily separated from the tooth surface, not easily cracked and broken, has a high visual opacity and low polymerization shrinkage.2

Composite resins are restorations whose basic principle of bonding with teeth is micromechanical (mechanical-interlocking)2, i.e. from resin tags on micro porosity on the enamel surface that has been etched3. Etching is performed to clean the smear layer and produce small pores on the enamel surface, so can provide mechanical retention in restoration4.

Acid etching material that is often used is phosphoric acid with concentrations ranging from 30-40%, but the most widely used concentration is 37%5. Phosphoric acid is a strong acid, 6 is able to release more hydrogen ions than weak acids, because it is able to completely mineralize6.
The strong acid can cause hydroxyapatite to dissolve so that the demineralization process occurs on the enamel surface\(^7\). When the composite resin is applied to the enamel surface that has been etched\(^8\), the resin will flow on the irregular surface and form a resin tag\(^9\), resulting in mechanical interlocking of the resin on the resin enamel\(^3\).

The use of phosphoric acid can be dangerous to the dental pulp\(^10\). Phosphoric acid can cause excessive demineralization so that it will increase the permeability of the dentin. Penetration of etching material will be more through the dentinal tubules into the pulp. The etching material of phosphoric acid with low pH causes the environment outside the cell to be hypertonic, so that the fluid inside the cytoplasm will be pulled out and the cell will contract. This can trigger permanent damage to odontoblast cells and cause an inflammatory reaction\(^11\).

The effects of using potentially harmful chemicals can be minimized by using alternative medicinal plants.

To overcome the shortcomings of etching that can irritate the dental pulp, natural materials that can replace etching, one of them with lemons. Lemon contains organic acids which are citric acid. Citric acid is a chelating solution that is able to remove the smear layer on the cavity so as to increase contact between the cavity surface and the restoration material\(^12\).

The shear strength test for tooth restoration is one way to measure the adhesion strength of the material\(^13\) to the restored tooth structure besides the tensile strength test\(^14,15\). In this research the magnitude of force acceptable for composite resin restorations was measured when the restorations were detached from the tooth surface. Shear strength can indicate how the adhesion occurs in vitro\(^16\).

The value obtained from the shear strength test is not absolute, but the value of the test results can be used to help compare an adhesive material. This research was conducted to find out more about the effect of lemon extract as an alternative etching material to the composite resin shear strength.

**Materials and Method**

The ingredients used were bovine teeth, 37% phosphoric acid, lemon extract, sterile aquadest, 96% ethanol, 0.9% PZ/NaCl solution, cotton pellet, composite resin bonding and composite resin.

The sample making of bovine teeth is as follows, each bovine teeth separated by the crown and roots, then planted on top of acrylic with the labial surface facing up. The sample was prepared in the labial section of a cylinder with a diameter of 4 mm and into 2 mm with contra angle low speed. Tooth cavity is checked using a sonde, to see the surface is smooth and then rinsed using distilled water and dried.

Making liquid lemon extract is as follows, as much as 1000 grams of lemon is prepared, washed clean, cut into small pieces and mashed with 96% ethanol as much as 2 liters using a blender. Lemon that has been smooth is transferred into a 2 liter volume jar for soaking (maceration) for 3 days. After 3 days soaking, then filtered with filter cloth separated the pulp with the filtrate. The ethanol filtrate was evaporated with a rotary evaporator with a temperature of 60 ° and ethanol pressure of 175 mbar until the solvent completely evaporated. The liquid yield of lemon extract was 165 ml, then the pH of the lemon extract is measured using litmus paper, around 2.5.

The next treatment procedure, bovine teeth were etched for 20 seconds, the samples were divided into 2 groups, namely group I: bovine teeth etched with 37% phosphoric acid, group II: bovine teeth) which was etched with liquid lemon extract. The etching material was rinsed with distilled water ± 1 cc until clean, then dry using blow dry for 10 seconds. Resin bonding was dropped on a microbrush as much as 1 drop (0.01 ml) and
applied to the surface of the cavity, irradiated with light
curing for 10 seconds (visible light with a wavelength of
400-800nm). Composite resin was applied using a plastic
filling instrument on the cavity layer by layer as many as
3 layers to meet the cavity, each layer was condensed
and shined by using light cure. Samples were stored in a
room temperature tool box for 24 hours. Shear strength
testing uses a Universal Testing Machine (Autograph).

Result

Average and standard deviation of composite resin
with phosphate and lemon extract can be seen on Table 1.

Table 1. Average and stand deviation of composite
resin with phosphate and lemon extract

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Average</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>7</td>
<td>12.5054</td>
<td>0.59058</td>
</tr>
<tr>
<td>Group II</td>
<td>7</td>
<td>12.9943</td>
<td>0.73885</td>
</tr>
</tbody>
</table>

Information:

a. Group I: Bovine teeth etched with 37% phosphoric
acid
b. Group II: Bovine teeth etched with liquid lemon
extract

Normality test with the Kolmogorov-Smirnov Z
test in both groups obtained p value for composite resin
group with phosphoric acid etching p value = 0.200 (p> 0.05) and for composite resin group with lemon extract
obtained p value = 0.200 (p> 0, 05). This shows that
the data from the two groups are normally distributed.
After knowing the data the two groups were normally
distributed then Independent T-Test was conducted.

Levene test results obtained a significant level of
0.629 which indicates that the variance of homogeneity
of data is normal. The statistical test was continued
with the Independent T-Test by using the results in the
normal variant sequence. The results of the Independent
T-Test in the sample group A and sample B obtained
a significant level of p = 0.197 (p> 0.05). This shows
that there is no significant difference between the shear
strength of composite resins with acid etching and composite resins with lemon extract.

Discussion

This research uses incisive cow’s lower teeth. Lower
mandibular incisors are used because they are easier to
obtain and are easily standardized. The chemical and
micromorphological composition between bovine teeth
and human teeth also has similarities. The results showed
that the amount of inorganic pyrophosphate in enamel
and dentin bovine teeth and human teeth was almost
the same. The research was conducted to determine the
difference in shear strength of composite resins
using 37% phosphoric acid etching with composite
resins using lemon extract. The magnitude of the shear
strength (MPa) is assessed based on the shear force (kgf)
acceptable to composite resin restorations.

The results showed no significant difference in shear
strength between composite resin with 37% phosphoric
acid etching and composite resin with lemon extract
etching. Lemon extract contains weak acids namely,
citric acid. Citric acid in lemon extract plays a role in
the process of dissolution of tooth enamel, because at
acidic pH causes an increase in hydrogen ions, which
will damage hydroxyapatite. Lemon extract shows a pH
of 2.5. The degree of acidity affects the coefficient of the
reaction rate, that the lower the pH or the more acidic, the
higher the rate of reaction to release Ca-P ions in tooth
enamel. High concentrations of H+ ions can dissolve
Ca-P bonds in hydroxyapatite so that enamel loses the
inorganic minerals that make up hydroxyapatite. This
condition is known as the demineralization process.

Demineralization of tooth enamel occurs through a
diffusion process which is the process of transferring
molecules from the enamel to saliva due to acid. Demineralization occurs when hydroxyapatite (Ca10
(PO4) 6 (OH) 2) crystals in tooth enamel dissolve in
acidic conditions into Ca2+ , (PO4) 3- and OH-. This
reaction can be explained as follows: Ca10 (PO4) 6
(OH) 2 + 8H + ↔ 10Ca2 + + 6 (HPO4) 2- + 2H2O. The
CaHPO4 molecule is a neutral molecule that will diffuse
out of the enamel thus the email will lose the inorganic
minerals that make up hydroxyapatite, while the two OH
ions bind to the H + ion to form 2H2O in the email.

Demineralization that occurs in a long time will
cause the loss of hydroxyapatite crystals so that enamel
is more porous and increases the microporosity of tooth
enamel. The formed microporosity will be activated by
the bonding material and composite resin, resulting in a
shear strength that is not much different from the yield of
37% phosphoric acid.

The results of the SEM (Scanning Electron
Microscope) test after the application of lemon extract on
bovine teeth also showed the formation of microporosity.
Lemon extract is more beneficial in terms of tissue health, because the pH is not too low when compared to the pH of 37% phosphoric acid. Lemon extract also has the ability to remove the smear layer and form microporosity like 37% phosphoric acid etching. The results showed no significant difference, but taking into account the advantages of lemon extract, the lemon extract can still be used as an alternative to 37% phosphoric acid etching.

**Conclusions**

The conclusion of the research is that lemon extract can be used as an alternative etching material on composite resin spills with shear strength.

**Conflict of Interest:** None

**Source of Funding:** Self-Funding

**Ethical Clearance:** This research has obtained research ethics that have been approved by the research team with number 208/HRECCFODM/VIII/2018.

**References**


Triangular Interaction of Decision Making for Breastfeeding a New Infant-Centered Care Model

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Abstract

To date, breastfeeding baby in hospitals is still a serious issue. The present study is aimed to investigate nurse-mother interaction in making decision on whether to breastfeed baby with low birth weight in a hospital. This qualitative study administered the grounded theory approach. For data collection, focus group discussion was implemented. Informants were selected with purposive sampling technique from three hospitals located in East Java Province, Indonesia. The validity test was satisfied with triangulation on sources, method and setting. New findings obtained from the study were classified into four categories, such as interaction, decision making, support and obstacles. The four categories form a triangle-shaped model of interaction. The first interaction is between nurse and spouse/family. The second one is between spouse/family with the mother. The third interaction is between mother and nurse. Support and obstacles may happen in every interaction. Decision making of breastfeeding mediated by the triangular interaction indicates that care is centered on infant. Nurses can improve the decision making quality of breastfeeding by minimizing obstacles and optimizing support in every flow of interaction.

Keywords: Breastfeeding, decision making, interaction, infant-centered care.

Introduction

Breast milk is the best food for infants. Breastfeeding infants with low birth weight (LBW) is a top priority because these infants commonly have poorer condition compared to infants with normal birth weight. However, when LBW infants are cared in a hospital, an undeniable problem happens, that is breastfeeding. Previous studies mention obstacles when breastfeeding infants during their stay in hospital, such as: 1) maternal and neonatal complication; 2) lack of quality and quantity in breastfeeding education; 3) hospital infrastructural obstacles for breastfeeding; 4) lack of privacy for breastfeeding mothers; and 5) lack of surveillance of baby care policy implementation in hospitals.(1)(2)(3)

Breastfeeding in hospitals is a challenge. Breast milk as an integral nutrition for babies is within mothers who stay apart from them. Separating mothers from their babies require therapeutic interaction mechanism enabling babies to receive breast milk continuously. The mother-nurse interaction is supposed to be not superficial interaction, but more on experience in developing relationship as a team who care for the babies. Goal achievement theory by King (1992) indicates that the
interaction process is influenced by perceptions of nurse and patient, goals, needs and values.\(^{(4),(5),(6)}\)

The mother-nurse interaction should start from the very first contact of baby caring. The interaction is principally aimed at fulfilling baby’s need, that is to improve its bio-psycho-spiritual health.\(^{(7)}\) However, the interaction commonly experiences problems, such as: 1) limited time for nurses to get to know patients and their families; 2) existence of opportunistic communication; 3) parents misunderstanding about nursing\(^{(8),(9)}\). Such problems result in delayed decision making for breastfeeding. Even worse, there will be an imbalance between breast milk supply and need; thus, low breastfeeding. The present study is aimed at discovering an appropriate model for nurse and mother interaction in making a decision of whether breastfeeding low birth weight infants in hospitals.

**Materials and Method**

This qualitative study administered grounded theory approach. This approach was considered appropriate because the study intended to investigate and understand the behavior in mother and nurse interaction in decision making. Field data becomes the grounded data to explain the real problem and to develop the theory.

**Participant:** 25 informants were selected purposively as samples consisted of three heads of perinatology room, five team chiefs of baby care, two implemented nurses and 15 mothers. The criteria determined for mothers as participants was to have a baby with low birth weight being nursed in baby care room starting from at least day two of care. An informant of the present study must be between 20 and 46 years old. The birth weight of born babies had to be between 1000 grams and 2400 grams. The nurse informants in the study aged between 28 to 47 years old, all nurse informants were female.

**Data Collections:** The data collection was performed in three hospitals located in East Java Province, Indonesia in August 2019. The main data collection technique administered was focus group discussion. FGD was done in every regency in three stages. The first FGD was done with the parents group, the second with the nurse group and the final stage was done with nurses and parents altogether. Other data were obtained from multiple sources, such as observation, field notes and literature review.

**Data analysis:** The data analysis of the present study was done in four stages. The first stage was coding to identify keywords. The following stage was concept building. The researchers gathered codes with similar data thus possible for categorization. Later the researchers created interrelated categories and built the concept. The third stage was categorization, that is to categorize interrelated concepts with the theory. The final stage was theorizing, in which the subject was explained by strengthening the existing theory.\(^{(10)}\)

**Findings:** The first stage of analysis successfully identified 70 keywords. These keywords were categorized following the content similarity thus forming a concept. The second stage of analysis resulted in 19 concepts. The interrelated concepts were arranged in a category. The following stage found four categorization, such as: interaction, decision making, support and obstacle. The concept of relationship, communication and information exchange formed the interaction category. Furthermore, the concept of choices, negotiation, distributed discussion, decision and commitment were wrapped up in the decision making category. The concept of being emotional, informational, instrumental and transporter formed the support category. Finally, the concept of complication, parent’s difficulties, breast milk production, infrastructure, distance, finance and lack of support were grouped in the obstacle category. Following these four categories, in the stage four of analysis a triangular interaction model was integrated involving reciprocal relationship of nurse, spouse/family and mother. Direct interaction is in making decision for breastfeeding. It can be seen that the reciprocal relationship of every subject involved is influenced by the support and obstacle factors (Fig 1.)

![Figure 1. Interaction Triangle in Decision Making](image)

Keterangan:
- **Obstacle**
- **Support**

Figure 1 describes the stages in the triangular interaction of decision making between nurse and mother/spouse/family. The first stage of interaction occurs between nurse and spouse/grandparents/family...
on day 1–2 of care. The second stage occurs between spouse/grandparents/family and mother on day 3–4. The third interaction is between mother and nurse on day 5 or longer. Support and obstacles may happen in every interaction.

Interactions consist of three concepts (1st-3rd concept), they are relationship, communication and information exchange. The first concept, the relationship, is the continuity of interaction between two or more people aimed at facilitating the process of getting to know each other. A positive relationship occurs when two parties involved in the interaction benefit from each other due to the harmonious reciprocity. This concept was formed in the first hand due to the interdependence in the nurse-parents interaction.

The second concept is communication. Communication and Interaction are two of the most frequently collocated words despite their differences. On the one hand, communication refers to the acts of sharing information, while on the other hand interaction is an extended term to which communication includes. A poor communication from a nurse will weaken the interaction impact. Actually, a quality communication tends to lead to individual communication, where communication in particular focuses on the patient/family condition. Being a nurse requires a well-trained communication skill so that the intended message can be successfully delivered. The whole process of nurse-parents interaction requires communication, begins with assessment, planning, implementing and evaluating.

The final concept is information or message exchange. Information exchange is a stage in analysis of decision making and an integral element in shared decision making. The present study empirically proves that there are three lanes of information exchange. The first one is information exchange between nurse and spouse/family, followed by that between spouse/family and mother and ended with information exchange between mother and nurses. In every information shared by nurses, the context must fit to knowledge, situation and awareness about information relevance with the situation faced. The information shared from mother/father/family must be in accordance with reality. Dishonesty may lead to misperception and decrease intervention. The three aforementioned contributed to the formation of interaction category. Interaction, communication, roles and decision making are essences in nursing.

The second category is decision making, comprised of five concepts (4-8th concept) such as choices, negotiation, distributed discussion, decision and commitment. Decision making is defined as taking one action among other alternatives. The fourth concept, choice, means that there is more than one available alternative action. The three alternatives in breastfeeding LBW are if baby is stable and has a good sucking reflex, direct breastfeeding is possible. If baby has poor sucking reflex, indirect breastfeeding (through feeding tube) is suggested. Finally, for unstable baby, breast milk needs to be stored in a reservoir. These alternatives are important when considering mother and baby’s condition.

The following concept is negotiation, that is the process of bargaining by reasoning together in order to achieve a mutual agreement. The data which supports this concept is the need of breast milk for LBW babies need mother’s presence, while they are separated. When mother does not breastfeed, the need for breast milk will not be fulfilled. The separation of mother and baby and inadequate breast milk are two situations which require negotiation. It plays a fundamental role in nursing and in making a decision. In this study, negotiation flows through three paths. The first one is when spouse/family negotiates with the nurse asking for postponement for the mother’s presence. Secondly, the negotiation takes place from mother to her spouse/family asking for some time to rest and recover before breastfeeding. The final negotiation is between mother-spouse-family to the nurse on duty to decide on the most applicable action for the condition.

The sixth concept is distributed discussion, that is when discussion is indirect between nurse and mother, mediated through spouse/family. Whereas distributed discussion means dispensed discussion, resulting in three paths of discussion. The paths occur because the spouse needs to speak with his wife beyond the time and place of discussion with the nurse. Mother only discusses with the nurse once she receives the key information from his spouse/family. The decision making becomes effective when the need to discuss with different people is reached. The core of the discussion is the need of breast milk for LBW. Any obstacles and available actions for breastfeeding are the topics of discussion.

The seventh concept is to decide or to ensure an option among others. Every activity in the process of decision making should eventually result in the best
choice. What it means by best is when the chosen action is a result of a thorough consideration expecting that the decision is approved by all parties involved. This chosen action is discussed after parents acknowledge the benefits and drawbacks of every available alternative. Breastfeeding for LBW includes several points to ponder, such as mother’s health, breast milk production, baby stability and sucking reflex. Whereas an appropriate consideration improves decision quality, the decision is collectively made, that mother’s decision is an agreement made with her family.

The eighth concept is commitment, that is an agreement to do something. Mother’s commitment to her decision indicates a quality decision. The quality decision must improve satisfaction and reduce regret. The keyword for commitment is mother’s presence to breastfeed or to deliver the pumped milk. Such commitment costs earnestness of all parties to take their roles. It is evident that different people involved in breastfeeding have different roles. These roles apply when making a decision through the interaction triangle. Whereas commitment makes baby as the center for care in making a decision for breastfeeding (Fig. 2).

Figure 2 shows that baby is the center of care which relies upon commitment of every party involved. The case of breastfeeding LBW has uniquely involved at least four major roles. Nurse plays the role as the leader and care designer, baby as the care receiver, mother as breast milk producer and spouse/grandparents/family take their role as transporter. Every involving party’s commitment towards each role indicates the attitude of acceptance and approval of decision.

The third category is support. Support consists of four concepts (9-12th concept) such as emotional, informational, instrumental and transporter support. To be precise, family support occurs through the three interaction paths. The ninth concept emotional support is given along with family acceptance of mother and baby’s condition, family’s willingness to help fulfill the mother and baby’s needs and family’s presence around.

The tenth concept is informational support, in which spouse/family delivers information to the mother. They receive information first from the nurse during the first interaction. Internal negotiation between mother, spouse and family needs information and knowledge about breast milk and needs to be aware of their roles in breastfeeding. Should any disharmony occur, negotiation will fail.

Furthermore, the eleventh concept is instrumental support, it is about family’s willingness to support financially for expenses incurred from the mother and baby care in the hospital. It is also about family’s readiness to take shifts in looking after the mother and baby in the hospital. On the other hand, the twelfth concept is the transporter support. It is spouse/family’s readiness and willingness to take mother or milk reservoir to the hospital where the baby is cared for. The fourth category is obstacle. This category consists of seven concepts (13-19th concept), such as baby’s complication (13th concept), parent’s difficulties (14th concept), breast milk production (15th concept), infrastructure (16th concept), distance (17th concept), finance (18th concept) and lack of support (19th concept). The obstacle category is found to occur in the three interaction paths.

Conclusions

Based on the descriptions of the four categories mentioned in the study, it can be concluded it is important to implement the triangular interaction model in decision making of whether to breastfeed LBW infants. Interaction, communication and information exchange are strategic ways to help parents decide. What is fundamental in the decision making is collaborated information, distributed discussion, decision and satisfying commitment.

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Data Security and Privacy of Individuals in Data Mining: A Critical Analysis of Data Mining in India

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Abstract

We live in a world where every day vast amounts of data flows in through various mediums. Data mining could be considered because of the natural growth of information technology. The concept of data mining is widely used all over as an instrument to mine hidden information from the database of companies that can be used by the respective companies to deal with their complicated business affairs and improve their services accordingly. Despite that the information revealed by data mining applications, people have shown their increasing concern about the other side of the coin, specifically the privacy threats posed by data mining. An individual’s privacy may be hampered or violated due to unauthorized access to their sensitive personal data, unwanted discovery of once embarrassing information etc. In this research paper the author desire to highlight the probable privacy issues that an individual must face due to data mining.

Keywords: Data mining, Information Technology, Individual’s Privacy, Sensitive Personal Data, Unauthorized Access.

Introduction

Since ancient times, the search for useful and important information has been carried on manually. With an expeditious growth in the volume of data, it is not possible to mine useful information manually. So, the miners have come up with more efficient and effective technologies or data mining techniques to handle such a search of useful patterns or knowledge. Data mining can be contemplated as an outcome of natural evolution of information technology. Data mining could be web data mining, social data mining, image data mining, healthcare data mining, financial data mining, e-book data mining, SQL data mining, mining data for fraud detection, stock market data mining, text or multimedia data mining, data mining for consumer segmentation, capturing, analysis and interpretation of data, new stories extraction, tracking and analyzing competitor’s growth, meta-data extrication from various websites and all. Since data mining deals with processing of “sensitive personal information”, data privacy and data security concerns are at its heights. With the advent of digital era and development of various technologies the data security, data protection and privacy preservation concern has just increased to another level.

Privacy, Security and Social Impact of Data Mining: Dr. B. Thuraisingham explained the main essence of Data mining by applying his own point of view and opinion. He stated, “Most of the time, data mining is part of our lives and we are often unaware of its presence. Data mining is present in many aspects of our lives and can influence our well-being of which we are unaware of such as ubiquitous and invisible data.
Invisible data mining can be in the form of smart software, such as search engines, customer adaptive web services, ‘intelligent’ database system, email managers, ticket masters and so on, incorporate data mining into its functional components”. [1]

However, it is important to know that many data mining application don’t even touch personal data, such as applications involving natural resources, the predictions of floods and drought, meteorology, astronomy, geography, geology, biology and other scientific and engineering data. Furthermore, most studies in data mining focus on the development of calculable algorithms and do not involve personal data. [2]

Dr. G. Piatetsky rightly stated “The focus of data mining technology is on the discovery of general or statistically significant patterns, not on specific information regarding individuals. For the data mining application that do involve personal data, in many cases, simple method such as removing sensitive IDs from data may protect the privacy of most individuals. Nevertheless, privacy concerns exist wherever personally identifiable information is collected and stored in digital form and data mining programs can access such data, even during data preparation”. [3]

Dr. Mark Todd stated, “Improper and nonexistent disclosure can be the root cause of privacy issues. To handle such concerns, numerous data security-enhancing techniques have been developed. There has been a great deal of recent effort on developing privacy preserving data mining method. Many data security-enhancing techniques have been developed to protect data. Database can employ a multilevel security model to classify and restrict data according to various security level, with users permitted access to only their authorized level”, where he explained the whole concept of Big data and how it is related to modern data science. Encryption is another technique in which individual data items may be encoded. This may include blind signatures (which build up on public key encryption), biometric encryption (where the image of the person’s iris or fingerprint is used to encode his/her information) and anonymous database (which permits the consolidation of various database but limit access to personal information to only those who need to know; personal information is encrypted and stored in different location. [4]

Intrusion detection is another active area of research that helps protect the privacy of personal data.

Privacy Issues and Data Mining when Violates Privacy of an Individual

As the definition goes ‘Data Mining’ is the mining of personal data stored in database for identifying potential knowledge, formerly unidentified, implicit information. [5] In an information era, preserving privacy refers to concealing personal information and having control over the use of such sensitive personal information. Before understanding how data mining has given rise to privacy issues, let us look at this example and get a hang of it. Example- There is a user who is capable enough to apply data mining software which is easily available online. This user can pose different queries and infer sensitive hypotheses. An inference problem occurs when a user who is engaged in data mining using various data mining techniques tries to withdraw inferences from the processed data. There are many data mining tools available online. [6]

The inference problem can be solved by building an inference controller which can detect the motives of the miner and prevent or stop the inference problem from occurring. Also, we can have different levels of privacy. For instance- Name, age, gender is comparatively less private than mobile phone numbers, salaries which are more private. Similarly, names and medical records collectively could be more private. [7]

With the origin of World Wide Web, there is now ample of information available about individuals that can be obtained within seconds. Such information could be obtained by way of mining or just from information retrieval. This makes it necessary to enforce controls on data mining technologies as well as databases. Enforcing such a control is practically difficult task with respect to data mining. [8] This calls for developing new techniques to stop users from extracting information from the data whether available on server or web.

Stepping on the social aspect, there prevail cultures where privacy of individual is preached. Also, there exist certain cultures where it is difficult to ensure privacy. [9] That could be with respect to technological or political issues or the fact that people believe that privacy is not essential. Many technologies or technological solutions have been proposed for data security in general and confidentiality could be used for privacy. The big challenge is to prevent violation of privacy without prejudicing the benefits of data mining. [10]

Data mining is often used to detect terrorist
activities by mining data of individuals and finding unusual patterns and fraudulent behavior. Acting in faith of national security, data mining is used for counter-terrorism applications.\textsuperscript{[11]} When at one hand, all these applications can benefit humans and save their lives, at the other hand it possesses threat to the individual’s right to privacy. There arises the conflict between two is difficult. This scenario has led to the developing of such privacy preserving measures that would help prevent privacy violation and at the same time will allow us to have the fruits of data mining technologies.\textsuperscript{[12]}

Data mining techniques sometimes also discloses business related critical information which compromises free competition and therefore discloser of personal or confidential information should be prevented.\textsuperscript{[13]} Hence, it was important to address the issue of privacy preserving in data mining. Different sanitizing measures were proposed to conceal personal data and sensitive patterns.\textsuperscript{[14]}

Certain ways in which privacy concerns have been raised by data mining techniques are as follows:\textsuperscript{[15]}

The implicit pattern covering information about the data subjects that can be derived from result in the data mining process vs. the explicit nature of personal information extracted by way of traditional database retrieval techniques.

The probable use of only single database to extract information about data subjects vs. use of multiple databases to extract information regarding the data subjects. The use of “open ended” queries to find out information on associations about an individual or groups vs. using specific questions to derive data about relationships that are already known.

The non-predictive aspect of unknown information obtained about an individual from data mining vs. general predictive aspect of data derived from traditional database technique.

Information of public nature is mostly extracted about an individual through data mining process vs. the intimate nature of information retrieved using traditional techniques about individual.

We often talk about privacy getting compromised in the process of data mining. How can we define privacy? We have heard people saying that “keep the information about me from being available to others.”\textsuperscript{[16]} And the Webster’s Dictionary defines privacy as “freedom from unauthorized intrusion”. In data mining case, the use of personal data in a way has some negative effect on someone’s life which creates concern. So here we are trying to identify that line beyond which data mining will lead to violation of right to privacy or threat data security. So basically, if the data is not misused, for most of the people it does not amount to any kind of privacy violation. The problem arises once the data mining results or information is released and is open to the probability of being misused.\textsuperscript{[17]}

It becomes difficult to impose universally acceptable rules to differentiate between right and wrong and demarcate the line beyond which data mining would pose threat to privacy.\textsuperscript{[18]} When the database is handled by an authorized miner for a noble cause to achieve benefits legally, then it is very much within the limits of data protection and data privacy. But the moment data mining technologies are used by unauthorized person or user or local service providers, there arises a probability of individual’s right to privacy getting violated. Using this distinction and ensuring that a data mining project will not enable misuse of personal sensitive information and opens opportunities that “complete privacy” would present.\textsuperscript{[19]} The same concern arises while collecting data. While collecting data we might come across and learn about individual’s data items. An individual might not care about someone knowing some common information about them like- name, date of birth, gender etc., but getting to know all these information leads to identify theft.

**Individual Rights in Relation to Processing of their Personal Data:** Individuals do possess certain rights regarding their personal data or information they share with service providers.\textsuperscript{[20]} An individual need to be aware of those rights to protect their sensitive personal information from getting misused. Some of such rights to be kept in mind are:

**Access to data:** Rule 5, subsection 6 of the IT Rules directs that any person or body corporate on its behalf must allow providers of information or data subjects to examine the information they may have given. The above section provides:

“Body corporate or any person on its behalf permit the providers of information, as and when requested by them, to review the information they had provided and ensure that any personal information or sensitive
personal data or information found to be inaccurate or deficient shall be corrected or amended as feasible. Provided that a body corporate shall not be responsible for the authenticity of the personal information or sensitive personal data or information supplied by the provider of information to such body corporate or any other person acting on behalf of such body corporate.”[21]

**Correction and Deletion**

Rule 5, subsection 6 of the IT Rules[22] says that “the data subjects must be permitted to access to the data provided by them to check that any information found to be inexact or deficient shall be rectified or amended as feasible. Although the rules don’t directly talk about the deletion of data, they state in Rule 5, subsection 1, which corporate institution or person representing them must secure written consent from data subjects regarding the use of the sensitive information they provide”. The above subsection provides:

“Body corporate or any person on its behalf shall obtain consent in writing through letter or Fax or email from the provider of the sensitive personal data or information regarding purpose of usage before collection of such information.”

**Objection to processing:** Rule 5 of the IT Rules[23] says that the data subject or provider of information shall have the option to later withdraw consent which may have the choice to later withdraw the consent which may have been issued to the corporate institution previously; such withdrawal of consent should be stated in writing to the corporate body. On withdrawal of consent, the corporate body is forbidden from processing the personal information or data in question.

**Disclosure of data:** Data subjects have rights with respect to disclosure of the information they provide. The disclosure of sensitive personal information needs the provider’s prior permission unless either:

i. Disclosure has already been agreed to be in the contract between the data subject and the data controller or[24]

ii. Disclosure is required for compliance with a legal obligation.

There are exceptions to this rule, if an order under law has been made, or if a disclosure must be made to Government agencies mandated under the law to obtain information for the purpose of:

- Verification of identity.
- Prosecution or punishment of offences
- Detection, prevention and investigation of crime

Recipients of this sensitive personal information are barred from further disclosing said information.

**Suggestions and Discussions**

As the questions have arisen regarding the definition and limitations of privacy in data mining, let us give a bird eye view on the newly invented technology of Secure Multiparty Computation (SMC).[25] The basic idea behind SMC is that the parties those who are involved acquire nothing but the results.

The technology of SMC makes sure that the involved party learns or acquires nothing but only the results. SMC involves the involvement of the third party. There may be substantial communication between the involved parties, but SMC makes sure that the parties do not learn anything from the concerned communication.

From much possible approach one of the reliable approaches is Constraint-based data mining. “This part of research is concerned with improving the efficiency of the algorithms and the understandability of results through providing up-front constraints on what results would be of interest.”[26]

**Conclusion**

Our main task for now is to determine that “line” beyond which data mining would result in the violation of an individual’s right to privacy. When a database or data set is accessed from a system by an authorized person or an authorized miner with clear intention, it is pretty much within the limits of data security. But the moment, the information stored in the database or data sets are accessed by unauthorized persons for their personal use, there lies a probability of the information getting misused or misplaced. Nowadays data mining software are available online, so it is easier for those unauthorized dealers and miners to access the information and exploit them. This has increased the concern for data protection and privacy preservation among the individuals.

Looking at the concern for the privacy among the individuals various Privacy Preserving Data Mining technologies (PPDM) have been developed and introduced. Secure Multiparty Computation, Data Obscuring, anonymization, perturbation and
augmentation have also been implemented. But it should surely be appreciated how the competent authorities are taking necessary measure and ways to prevent any such data mining which is infringing individuals right to privacy and I must say that there is a long way to go and to develop the erring rod to maintain the check and balance in the abstract world by cyberspace.

**Ethical Clearance:** Not required as the researcher has just referred to some published works. The research is doctrinally undertaken, completely by the researcher himself.

**Source of Funding:** Self

**Conflict of Interest:** Nil

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23. The Information Technology (Reasonable security practice and procedure and sensitive personal data or information) Rule, 2011.
Effectiveness of Exercise Regimen on Quality of Sleep in Patients with End Stage Renal Disease on Maintenance Haemodialysis

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Abstract

Background: Patients on maintenance haemodialysis suffering from sleep problem, Exercise makes the patient tired and improves the circulation in the body which leads to induction of sleep. The present study aimed to evaluate the effectiveness of exercise regimen on quality of sleep of patients.

Materials and Method: A pre-experimental research design was used to assess quality of sleep among 30 patients with End Stage Renal Disease on Maintenance Haemodialysis. Patients were allocated to intervention group via purposive sampling technique. Intervention for intervention group included exercise for two weeks (5 days in a week). Interview based standardized questionnaire was used to assess the quality of sleep by using Pittsburgh Sleep Quality Index (PSQI) in association with clinical and lab values. Patients were followed on every day for two weeks by using phone call reliability and feedback form.

Result: Pre test sleep quality score was (9.766± 1.887) and post- intervention sleep quality score was (7.60± 2.175), there is a decrease in score of sleep; hence there is positive effect of exercise regimen on sleep. Lab values: calcium, platelets, chloride and albumin are having significant relation with sleep quality by using regression analysis.

Conclusion: Non pharmacological method are more effective to improve the quality of sleep among patient on maintenance haemodialysis having sleep problem.

Keywords: Haemodialysis, Sleep quality, Pittsburgh sleep Quality (PSQI), Ca, platelet, Chloride, Albumin.

Introduction

Sleep is a common problem among patients with end stage renal disease on maintenance hemodialysis due to excessive accumulation of fluids in the body. Most of the reported complaints are insomnia, restless leg syndrome (RLS), sleep-disordered breathing and excessive daytime sleepiness (EDS). It has been reported that 80% of ESRD patients receiving dialysis reports sleep complaints with daytime sleepiness. In healthy individual sleep is lead by decrease in sympathetic activity and increase in vagal tone that leads to reduction of blood pressure at night. According to Hildert Most of the Patients with ESRD are having sympathetic-vagal imbalance due to baro receptor reflex malfunctioning in which there is a hyperactivity of the sympathetic nervous system and decreased vagal tone.

As for the sleep - wake circadian rhythm melatonin hormone is responsible. It is secreted in less amount
during the daytime but increases its amount during the night, which helps in falling asleep. But in ESRD patients the amount of melatonin secreted by pineal gland is less which affects the sleep cycle.\(^5\)

Also there is overnight rostral shifting of fluid from legs toward neck and result in restriction and collapse of upper airway. Pathogenesis of Obstructive sleep apnea is unknown but Rosilene M, hypothesized that changes in neck circumference and severity of obstructive sleep apnea is related to overnight shifting of leg fluid volume in ESRD patients.\(^6\) Physical activity improves sleep quality and increase sleep duration. Exercises increase the circulation of blood in the body. Exercise makes the patient tired and reduces the stress, which help in induction of sleep. Hence simple to moderate exercise results in maintenance of good sleep quality among hemodialysis patients. The workout about 30 minutes in a day 5 times a week, if cant fit it even just having 10 minutes a day of walking, swimming or riding can help in getting night sleep (“National sleep foundation’’).\(^7\)

**Materials and Method**

A pre- experimental research design was conducted in dialysis unit of Fortis Hospital, Mohali. The permission taken from the Research and ethical committee of the Hospital. Written informed consent form were filled from the patients suffering from sleep problem.

Inclusion criteria of the study was Patients with End Stage Renal Disease, Above 18 years of age, Consenting for participation in study, who were able to walk, Patient able to carry out intervention and Patients who were willing to participate in the study. Exclusion criteria of the study was Patients with-Any other co-morbidity like liver disease, infected patients/HIV, Patients admitted in intensive care units, Any recent major post-operative patients, History of any analgesics medication (opioid and non opioid)and Patients going for evening walk as normal routine activity.

After fulfilling the inclusion and exclusion criteria, Sociodemographic data collected. Patients Lab Values: RFT’s, LFT’s and Urine test sample taken. Patient comorbidities data also collected.

Exercise intervention was provided to the patients. Patients were asked to do evening walk of (25-30 minutes) for consecutive two weeks (five days in a week). Phone call based reliability of exercise was done on daily basis from the day of starting till the end of intervention i.e., evening walk. Written feedback was taken in mid of the intervention period by using feedback form for assessing any difficulties, confusions and their experience during the walk. Subjects were evaluated on eleventh day of intervention period to obtain posttest information regarding clinical variables and sleep quality by using Pittsburgh Sleep Quality Index.\(^8\)

**Findings:**

<table>
<thead>
<tr>
<th>Table 1: Comparison of level of sleep quality among haemodialysis patients with End stage Renal Disease. N=30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of sleep quality score</td>
</tr>
<tr>
<td>Very good (0)</td>
</tr>
<tr>
<td>Fairly good (1-7)</td>
</tr>
<tr>
<td>Fairly bad (8-14)</td>
</tr>
<tr>
<td>Very bad (15-21)</td>
</tr>
</tbody>
</table>

Table No.1 depicts the comparison of level of pretest and posttest scores of sleep quality. It shows significant improvement from pretest to posttest scores i.e., there is decrease in percentage of fairly bad sleep lie from 90% to 53.3% and increase in percentage of fairly good sleep lie from 6.7% to 43.3%

**Table 2: Comparison of mean pretest and mean post test score of sleep quality among haemodialysis patients with End Stage Renal Diseases. N=30**

<table>
<thead>
<tr>
<th>Subject with Sleep Quality</th>
<th>Mean sleep quality score</th>
<th>Mean difference</th>
<th>Standard Deviation</th>
<th>t-value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group N= 30</td>
<td>9.766</td>
<td>7.60</td>
<td>0.367</td>
<td>4.097</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

Level of significance=0.05 *Significant = p<0.05
Minimum =0 Maximum =21
Table No 2 depicts the comparison of mean pretest and mean posttest scores of sleep quality among hemodialysis patients. Paired T-test used for the comparison which shows mean, mean difference, standard deviation t- value and p value. It shows significant result as p value is <0.005. P- Value is 0.001, it shows that our null hypothesis was rejected and research hypothesis was accepted i.e., “There is significant effect of exercise on sleep quality in patients with End Stage Renal Disease on Maintenance Haemodialysis”.

Table 3: Comparison of various components of sleep quality among patients on hemodialysis. N =30

<table>
<thead>
<tr>
<th>Components of sleep quality</th>
<th>Pretest Mean + S.D.</th>
<th>Posttest Mean + S.D.</th>
<th>t value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjective Sleep quality</td>
<td>1.53+ 0.571</td>
<td>1.13+ 0.346</td>
<td>4.397</td>
<td>0.001**</td>
</tr>
<tr>
<td>Sleep Latency</td>
<td>2.17+ 0.648</td>
<td>1.73+ 0.691</td>
<td>4.176</td>
<td>0.001**</td>
</tr>
<tr>
<td>Sleep duration</td>
<td>1.83+ 0.592</td>
<td>1.33+ 0.547</td>
<td>4.785</td>
<td>0.001**</td>
</tr>
<tr>
<td>Habitual sleep efficiency</td>
<td>1.40+ 0.932</td>
<td>0.97+ 0.928</td>
<td>2.282</td>
<td>0.030*</td>
</tr>
<tr>
<td>Sleep disturbances</td>
<td>1.37+ 0.490</td>
<td>1.13+ 0.346</td>
<td>2.971</td>
<td>0.006**</td>
</tr>
<tr>
<td>Use of sleeping medication</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Daytime functions</td>
<td>1.50+ 0.731</td>
<td>1.27+ 0.640</td>
<td>1.651</td>
<td>0.109</td>
</tr>
</tbody>
</table>

Level of significance= 0.05 *Significant = p<0.05

Table 3 :Depicts the comparison of various seven components of sleep quality. Paired T- test was used for comparison which shows mean with standard deviation, t value and p value of all the components. All the components were significant because there p value was <0.005 and daytime functions was not significant as its p value was >0.05.

As sleep medication was our exclusion criteria, no patient were chosen who are on sleep medication

Table No. 4: Association of clinical variables with sleep quality.

<table>
<thead>
<tr>
<th>Clinical Variables</th>
<th>Unstandardized B Coefficients</th>
<th>Standardized B Coefficients</th>
<th>t- value</th>
<th>p- value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium (mg/dl)</td>
<td>0.836</td>
<td>0.496</td>
<td>3.663</td>
<td>0.001**</td>
</tr>
<tr>
<td>Platelets (thou/ul)</td>
<td>0.011</td>
<td>0.457</td>
<td>3.431</td>
<td>0.0002**</td>
</tr>
<tr>
<td>Chloride (mEq/L)</td>
<td>-0.157</td>
<td>-0.335</td>
<td>-2.519</td>
<td>0.019*</td>
</tr>
<tr>
<td>Albumin (gm/dl)</td>
<td>-0.417</td>
<td>-0.289</td>
<td>-2.145</td>
<td>0.042*</td>
</tr>
</tbody>
</table>

Table 4 depicts the association of clinical variables with the sleep quality. It shows the B coefficients, t value and p value.

A stepwise regression was performed, four variables were included in the final model such as calcium (B = 0.836, p value = 0.001), followed by platelets(B = 0.011, p value = 0.0002), chloride(B = -0.157, p value = 0.0s19) and albumin(B = -0.417, p value = 0.042).

The excluded variables were hemoglobin, TLC, urea, creatinine, phosphorus, sodium, potassium, vit D as they were not found significant.

Findings: Pre- test score was (9.766± 1.887)and the post test score of sleep quality was (7.60± 2.175).

P<0.001“There is significant effect of exercise on sleep quality in patients with End Stage Renal Disease on Maintenance Hemodialysis”.
There is decrease in percentage of fairly bad sleep lie from 90% to 53.3% and increase in percentage of fairly good sleep lie from 6.7% to 43.3%.

All the components were significant because there p value was <0.005 and daytime functions was not significant as its p value was >0.05.

As sleep medication was our exclusion criteria, no patient were chosen who are on sleep medication.

A stepwise regression test states that On the basis of standardized B coefficients the order of influence on sleep quality was calcium (B = 0.496), followed by platelets (B = 0.457), chloride (B = -0.335) and albumin (B = -0.289).

The excluded variables were hemoglobin, TLC, urea, creatinine, phosphorus, sodium, potassium, vitamin D as they were not found significant.

**Conclusion**

The total number of sample was 3090% of patients were having fairly bad sleep quality before the intervention. The pretest score is (9.7667 +1.887) and the post test score of the study is (7.600±2.175). The p value of study is .001; this showed that there is positive effect of the exercise regimen on end stage renal disease on maintenance haemodialysis. According to standardized B coefficients these four variables influencing the sleep quality of the patients and the B coefficient is calcium (B = 0.496), followed by platelets (B = 0.457), chloride (B = -0.335) and albumin (B = -0.289).

This states that only calcium, platelets, chloride and albumin are influencing the QOS of the patients. This means that except these four variables the result of good sleep quality is occurred due to the exercise

The researcher concluded from the study that there is a positive effect of an exercise on quality of sleep of patients which were on maintenance hemodialysis.

**Conflict of Interest:** There was no conflict of interest in the statement.

**Source of Funding:** Nil

**Ethical Clearance:** Ethical clearance taken from the Dialysis unit of the Fortis Hospital, Mohali, Punjab.

**References**


The Effects of Service Payment Retardation from National Health Insurance Claim to the Employee’s Work Motivation According to Theory of Frederick Hezberg in the Hospital

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Abstract

Introduction: In era of National Health Insurance, the number of insurance participants was in increase and recorded approximately about 203,28 million (77%) from the total population of Indonesia, this condition affected to the invoice amount which must be paid by Social Insurance Administration Organization (BPJS) to the related hospital which partnered with this organization. The implementation of this deal delivered to good effects from either the hospital or related organization¹¹. In Jember, it was indicated retardation or delay of service payment in certain hospitals. The retardation of service payment was very influential to the work motivation of employee which affected to the quality of service, the employee motivation was very significant to build quality performance for the employee. The accurate illustration which depicted this relation was that the motivation could raise high work satisfaction on employee, this condition was realized if the employee’s expectation and need could be realized in both material and non-material, if those were fulfilled, then their work motivation would be built. The objective of this research was to analyze the effects of service payment retardation from National Health Insurance claim to the motivation of employee based on Frederick Hezberg’s theory in RSD Balung.

Method: This research was included into quantitative research which exerted cross sectional research method. The total population of this research were all employees in RSD Balung Jember District, specifically in about 157 respondents. The method of data sampling was stratified random sampling according to the level within this research population. The total sample of this research was 60 respondents¹⁵. Further, the data collection was employed through questionnaire and was then analyzed through ordinal regression. Based on the research finding, it showed effects between service payment retardation from National Health Insurance claim to the employee’s motivation accordingly to theory of Frederic Hezberg.

Keywords: Service Payment Retardation, Motivation, Theory of Frederick Hezberg.

Introduction

Research Background: The government attempts to implement Universal Health Coverage gradually by issuing program of National Health Insurance (JKN), which is managed by Social Insurance Administration Organization (BPJS). In the era of National Health Insurance, the participants of this program keep increasing since 2018, it was recorded in about 203,28 million (77%) from the total population in Indonesia¹⁴. The increase of JKN participant number in many hospitals impacts to the huge amount of invoice which must be paid by Social Insurance administration Organization (BPJS). The retardation of service payment in some hospitals is also occurred in Jember. This retardation of
health service payment is very influential to the work motivation of employee which then impacts to the quality of health service, the employee’s motivation is regarded as very significant to realize quality performance for the employee\(^3\). The accurate image which can depict this relation is that the motivation can create high work motivation, this condition can be realized if the employee’s expectation and need are fulfilled well in both material and non-material, then, it will raise to their work motivation\(^2\).

The motivation is a whole process of encouragement or stimulation which given to the employee to have willingness in work sincerely without any forms of compulsion, moreover, the organization will be able to perform all programs if the employee within this organization are successful to do their tasks well according to their field and responsibility\(^1\(3\).

The theory of work satisfaction explains that the aspect which motivates work motivation of employee in order to fulfill their need in both material and non-material satisfaction. This aspect is considered as reward given to the employee\(^4\).

The purpose of motivation is to develop work satisfaction on employee\(^1\). The factor of motivator can raise the work satisfaction. Moreover, the theory of work motivation and satisfaction have been demonstrated by many experts. The theory of motivation from Hezberg has asserted two factors which can influence work motivation on employee in order to create their work satisfaction, as they are factor of motivator and factor of hygiene. The factor of motivator is consisted of achievement, recognition, the work itself, responsibility, advancement, the possibility of growth. Next, the factor of hygiene is consisted of work situation, wage or compensation, relation with co-worker and work safety. The implementation of motivator and hygiene factor in an organization can boost the improvement of employee’s work satisfaction, thus, it is summed that the individual will feel satisfied and motivated if they have accepted appreciation (salary, incentive and allowance)\(^10\).

In Jember, the service payment in several hospitals from JKN claim has been in retardation or delay, including to a hospital in Balung since 2018-2019. This situation is affected by a number of factors as internal and external factor. The internal factor is the factors which can occur in the hospital, for instance administration process of claim submission as well as lack of claim document files. The external factor is the factor might be raised from related parties of BPJS which go through certain budget deficit.

The research finding by NurFadhila & Syahrir (2017) has stated that the level of employee’s satisfaction regarding to the service becomes an indicator to indicate how far the success of service which has been offered by Social Insurance Administration Organization (BPJS). The service is related to the work satisfaction. Moreover, the work satisfaction cannot be separated from work motivation which is frequently the expectation of employee\(^3\).

Based on those backgrounds, the researchers are interested to identify the effects of service payment retardation from National Health Insurance (JKN) claim to the employee’s motivation based on theory of Frederick Hezberg.

**Method**

This research was included into a quantitative research which employed cross sectional research design. This research was conducted in RSD BalungJember. The research and data analysis was started in December 2019 – January 2019. The population in this research were all employees of RSD BalungJember District in approximately 157 respondents. The method of data sampling was slovin formula which was then presented per profession of health officer or non-health officer through lemeshow formula, it was resulted to 60 respondents. The variable of research was consisted of independent variable as retardation of service payment from JKN claim, while the dependent variable was employee’s motivation according the theory proposed by Frederick Hezberg. The instrument of data collection in this research was questionnaire. The result of data collection was then analyzed by exerting ordinal regression method. Further, this research has been tested ethically in ethics commission of health research of Faculty of Dentistry, University of Jember in regulation number 583/UN25.8/KEPK/DL/2019.

**Findings:** The research data was analyzed through ordinal regression and presented in two sections. The first section was general data, while the second was specific data of research.
General Data:

<table>
<thead>
<tr>
<th>Respondent Characteristic</th>
<th>Clarification</th>
<th>Number (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>23</td>
<td>38.3%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>37</td>
<td>61.7%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>Age</td>
<td>21-30 Years Old</td>
<td>19</td>
<td>31.7%</td>
</tr>
<tr>
<td></td>
<td>31-40 Years Old</td>
<td>25</td>
<td>41.7%</td>
</tr>
<tr>
<td></td>
<td>41-50 Years Old</td>
<td>8</td>
<td>13.3%</td>
</tr>
<tr>
<td></td>
<td>&gt;50 Years Old</td>
<td>8</td>
<td>13.5%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>Employment Status</td>
<td>Civil Servant (PNS)</td>
<td>9</td>
<td>15.0%</td>
</tr>
<tr>
<td></td>
<td>Internship</td>
<td>20</td>
<td>33.3%</td>
</tr>
<tr>
<td></td>
<td>Contract</td>
<td>12</td>
<td>20.0%</td>
</tr>
<tr>
<td></td>
<td>Temporary Worker (PTT)</td>
<td>12</td>
<td>20.0%</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>7</td>
<td>11.7%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>Educational Background</td>
<td>Senior High School</td>
<td>7</td>
<td>11.7%</td>
</tr>
<tr>
<td></td>
<td>Diploma I/II/III/IV</td>
<td>26</td>
<td>43.3%</td>
</tr>
<tr>
<td></td>
<td>Bachelor</td>
<td>17</td>
<td>28.3%</td>
</tr>
<tr>
<td></td>
<td>Magister</td>
<td>3</td>
<td>5.0%</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>7</td>
<td>11.7%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>Marriage Status</td>
<td>Married</td>
<td>31</td>
<td>51.7%</td>
</tr>
<tr>
<td></td>
<td>Unmarried</td>
<td>29</td>
<td>48.3%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

Based on the table, it referred that the total who involved in this research were 60 respondents, approximately 11.7% or as many as 7 respondents were the graduate of Senior High School, 43.3% or as many as 26 respondents were graduate of Diploma Program I/II/III/IV, 28.3% or as many as 3 respondents were graduate of Magister Program and 11.7% or as many as 7 respondent were from various educational backgrounds. The age of employee in RSD BalungJember District was in range of 21-30 years old 31.7% or as many as 19 respondents, the age range between 31-40 years old 41.7% or as many as 25 respondents, the age range between 41-50 years old 13.3% or as many as 8 respondents and the age range > 50 years old 13.5% or as many as 8 respondents. The total of respondents in employment status of Civil Servant (PNS) 15.0% or as many as 9 respondents the employment status of internship 33.3% or as many as 20 respondents, the employment status of work contract 20.0% or as many as 12 respondents, the employment status of temporary worker (PTT) 20.0% or as many as 12 respondents and other employment status 11.7% or as many as 7 respondents. Furthermore, the employee in RSD Balung in marriage status of married 51.7% or as many as 29 respondents, while unmarried status 48.3% or as many as 29 respondents.
Specific Data:

Table 2. Analysis on Service Payment Retardation from National Health Insurance (JKN) Claim

<table>
<thead>
<tr>
<th>Category</th>
<th>Clarification</th>
<th>Number (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retardation of Service Payment from JKN Claim</td>
<td>Retarded</td>
<td>52</td>
<td>86,7</td>
</tr>
<tr>
<td></td>
<td>On Time</td>
<td>8</td>
<td>13,3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>60</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Based on the table, it indicated that from the total of 60 respondents, 86,7% or respondents or as many as 52 respondents were late or retarded and 13,3% or as many as 8 respondents were stated as on time in their health service payment.

Table 3. Employee’s Work Motivation in RS Balung

<table>
<thead>
<tr>
<th>Category</th>
<th>Clarification</th>
<th>Number (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Motivation</td>
<td>Less Motivated</td>
<td>35</td>
<td>58,3</td>
</tr>
<tr>
<td></td>
<td>Fairly Motivated</td>
<td>18</td>
<td>30,0</td>
</tr>
<tr>
<td></td>
<td>Motivated</td>
<td>7</td>
<td>11,7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>60</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Based on the table, it demonstrated that from 60 respondents, 58,3% or as many as 35 respondents were less motivated, 30,0% or as many as 18 respondents were fairly motivated and 11,7% or as many as 7 respondents were considered as motivated.

Table 4. Cross Tabulation on Service Payment Retardation from National Health Insurance (JKN) Claim towards employee’s Work Motivation

<table>
<thead>
<tr>
<th>Work Motivation</th>
<th>Motivated</th>
<th>Fairly Motivated</th>
<th>Less Motivated</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retardation of Service Payment from JKN Claim</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On Time</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Retarded or Late</td>
<td>2</td>
<td>16</td>
<td>34</td>
<td>52</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7</strong></td>
<td><strong>18</strong></td>
<td><strong>35</strong></td>
<td><strong>60</strong></td>
</tr>
</tbody>
</table>

Result of Ordinal Regression Test: p=0,000

The table has explained the result of data analysis which employed ordinal regression method in order to analyze the effects of service payment retardation from National Health Insurance (JKN) claim to the employee’s work motivation. Moreover, the result of data analysis showed that p value (0,000) a (0,05%) which was referred the effects of service payment retardation from National Health Insurance (JKN) claim to the employee’s work motivation.

Discussion

The research finding referred the effects between retardation of health service payment from National Health Insurance (JKN) claim and employee’s work motivation in RS Balung, which particularly resulted to the p value 0,000 (< 0,05). The appreciation in form of salary was the most complex task for the hospital in work environment, meanwhile it was the significant aspect for the employee, since the amount of salary and its punctuality in salary or wage payment would reflect the measurement of their performance among employees, families and society, while it was also significant for the behalf of hospital itself, because it would reflect the hospital attempt to maintain the human resource in order to build high loyalty and commitment in the hospital. Moreover, the motivation was a form
of support which functioned to stir the employee to be able to develop their performance, so they could realize and pursue the purpose of hospital\(^8\). The motivation was very important for the employee, because it was an aspect which affected, distributed and supported human behavior to be able to work with enthusiasm in order to achieve optimal result\(^{12}\). The accurate image which could illustrate this relation was that the motivation was able to raise high work satisfaction on the employee, this situation could be realized if the employee’s expectation and need was fulfilled in both material and non-material, then it would build work motivation on them\(^7\).

The purpose from this motivation was to improve work motivation on the employee. The factor of motivator could build work satisfaction. Further, the theory of motivation and satisfaction has been asserted by many experts. Those theories would keep developing, especially in sector of psychology, human resource management and organizational behavior. The implementation of work was very affected by an important factor, hygiene factor. The factor of hygiene was aimed to maintain the level of work motivation on employee, if this factor was given properly. But, if this factor was given improperly, it would impact to the decrease of enthusiasm and work performance of employee\(^6\).

The motivation which given to the employee was not that easy, since the organization must firstly consider several factors which could influence the employee’s work motivation. The theory of motivation from Hezberg has asserted two factors which could influence the employee’s work motivation in order to create their work satisfaction, as factor of motivator and factor of hygiene. The factor of motivator was consisted of achievement, recognition, the work itself, responsibility, advancement and the possibility of growth. While, the factor of hygiene was comprised of work condition, salary or compensation, relation with co-workers and work safety. Next, the implementation of both factors of motivator and hygiene in an organization could encourage the improvement of employee’s work satisfaction, therefore, it was concluded that the individual would feel satisfied and motivated if their received appropriate form of appreciation (salary, incentive and allowance)\(^5\).

The practice of motivator factor in an organization was able to encourage the improvement of employee’s work satisfaction, then, it was summed that the individual would feel satisfied and motivated if they received appreciation form the organization (salary, incentive and allowance). Reversely, the factor of hygiene would cause individual unmotivated in work, since the purpose of motivation was to improve the work satisfaction on employee\(^9\).

**Conclusions**

Based on the research findings, it was concluded that this research studied about the effects of service payment retardation from National Health Insurance (JKN) claim to the employee’s work motivation in the hospital. According to the data analysis in this research, it was found that the retardation of service payment could affect to the work motivation of employee in the hospital, moreover, the purpose of this motivation delivery was to improve the employee’s work satisfaction.

This research also explored the causal factors of employee’s work motivation, especially in the work area of hospital. Based on this research, the researchers suggested the next researchers to study this similar research focus in deeper, particularly on the factors which cause unmotivated individual either in direct or indirect.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** This research has undergone ethical test in ethics commission of health research of Faculty of Dentistry, University of Jember in this following registration number 690/UN25.8/KEPK/DL/2019.

**References**


Hyperpigmentation of Skin (Melasma) with Solitary Oral Pyogenic Granuloma Lesion: A Case Report

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¹Professor, Department of Periodontology, ²Post Graduate Student, Department of Periodontology, ³Head of Department, Department of Periodontology, ⁴Senior Lecturer, Department of Periodontology, Subharti Dental College, Swami Vivekanand Subharti University

Abstract

The pyogenic granuloma is a relatively is an exaggerated tissue response to localised irritation or trauma. Histologically, pyogenic granuloma does not present as granuloma and is devoid of pus. It is filled with vascular channels filled with inflammatory fluid, connective tissue with immature fibroblasts and inflammatory cells scattered. It occurs most commonly in the gingiva and also lips, tongue and buccal mucosa are the other common sites. Melasma is a common skin condition hyperpigmentation of sun-exposed areas, especially on the face which is usually light to dark brown, symmetrical and irregular in appearance. Although melasma can affect all races and both sexes, it is more commonly seen in women of child-bearing age and in dark-skinned individuals living in areas with intense ultraviolet (UV) radiation. Hyper pigmentation on exposed areas such as the face can be a source of cosmetic concern for patients, that can negatively impact quality of life (QOL). The present case reports a localized inflammatory hyperplasia of the maxillary gingival of a 38 year male patient who was suffering from melasma. Melasma is a disorder of hyperpigmentation with psychological impacts affecting majorly the face. Excisional biopsy of the lesion revealed findings suggestive of Pyogenic Granuloma. Excision of pyogenic granuloma may also predispose to recession of interdental soft tissue.

Keywords: Gingival, melasma, inflammatory hyperplasia, pyogenic granuloma.

Introduction

Pyogenic granuloma (PG) is an inflammatory hyperplasia describing a large range of nodular growths of the oral mucosa.¹ PG is a common nonneoplastic growth of the oral cavity and the first case was described by Hullihen.² Even though various terms have been proposed earlier, Hartzell gave the current term of PG or granuloma pyogenicum.³ Melasma (from the Greek word, ‘melas’ meaning black) is a common, acquired, circumscribed hypermelanosis of sun-exposed skin. It presents as hyperpigmented macules that are hyperpigmented, symmetrical with serrations and geographical borders. The most common locations are the cheeks, upper lips, the chin and the forehead, but other sun-exposed areas may also occasionally be involved.⁴

Although melasma may affect any race, it is much more common in skin types that are darker than in lighter skin types and it may be more common amongst asian and hispanic races who live in areas of the world with intense solar ultraviolet exposure. Melasma is the most common pigmentary disorder among Indians. It is much more common in women during their reproductive years but about 10% of the cases do occur in men.⁵

Although PG is a common disease in the skin, it is rare in the gastrointestinal tract, except for the oral cavity and it is mostly found in keratinized mucosa. There are various factors such as chronic low-grade irritation, trauma, hormonal factors and certain kinds of drugs which are proved to be the causative factors in the development of PG. Oral PGs occur in the gingival in 75% of cases and precipitating factors include poor oral hygiene, local irritants and foreign material in the gingival. Although many lesions occurring in the oral cavity have got similar appearance as PG, a detailed history, clinical examination and a proper treatment plan
In this article, we will present a case report of a large pyogenic granuloma of the gingiva in a 38-year-old male patient and also will review the literature in detail.

**Case Report:** A 38-year-old male patient reported to the outpatient department of Subharti Dental College with the chief complaint of a growth in the gums in the upper left back tooth region since 2 months. The growth initially started as a small one, which progressively increased to the present size. Patient was asymptomatic 1-month back, but patient suddenly started to feel pain on eating food. The patient also stopped brushing in the area due to excessive bleeding from that region.

Soft tissue examination revealed a well-defined gingival growth in the dentulous 24-26 tooth region as a rounded vascular lesion (Figure 1). The growth was nontender and firm on palpation and on probing; there was severe bleeding from the site. The lesion was excised with electrocautery and was sent for biopsy (Figure 2). The biopsy report suggested the growth to be 0.5x0.5x0.3 cm in size, soft to firm to consistency (Figure 3 & 4). A provisional diagnosis of PG of the gingiva was given. Differential diagnosis of irritational fibroma and peripheral giant cell granuloma were given.

The patient was suffering from melasma (Figure 5) and was on medication for the same for past one month. His medication included usage of solset sunscreen gel to be applied twice a day at 8 am and 12 noon respectively, Brilanie serum and Capsule Lyos once a day for 30 days. There were relevant melasma spots on forehead and hands of the patient. Intraoral examination revealed a good oral hygiene.
**Figure 5: Melasma lesion on forehead with a V shaped appearance.**

**Discussion**

PG is a kind of inflammatory hyperplasia and also termed as granuloma pyogenicum. PG is a misnomer because the lesion does not contain pus and is not a granuloma also. PG is caused by a known stimulant such as calculus or foreign material in the gingival crevice resulting in a proliferation of connective tissue. In addition, one-third of the lesions occur after trauma.

Ainamo et al\(^7\) suggested that routine tooth brushing habit caused repeated trauma to gingival, resulting in these lesions. Furthermore, release of variety of endogenous substances and angiogenic factors, trauma to deciduous teeth, aberrant tooth development, occlusal interferences, drugs such as cyclosporin and selection of wrong healing cap for implants are some of the precipitating factors for PG whereas Neville\(^8\) stated that oral PGs occur in all age groups, children to older adults, but frequently seen in females in the second decade due to increased levels of hormones. It appears as an elevated sessile or pedunculated growth covered with red hemorrhagic and erythematous papules and show ulcerations and is covered by a fibrinous membrane. Clinically, the lesion can be slow-growing, asymptomatic and painless, but it may also grow rapidly sometimes.

Regezi JA et al\(^8\) stated that the treatment includes surgical excision of the lesion with the removal of irritants recommended for small painless lesions. Excision of gingival lesions up to periosteum with thorough scaling and root planning of adjacent teeth to remove all visible sources of irritation whereas Jafarzadeh H found other treatment modalities include Nd: Yttrium-aluminum-garnet lasers, carbon dioxide lasers, flash lamp, pulse dye laser, cryosurgery, sodium tetradecyl sulphate sclerotherapy and use of intralesional steroids have been proposed by clinicians.

He also stated that incomplete excisions, failure of removal of etiological factors contribute to the recurrence of these lesions. Taira JW\(^9\) found that a recurrence rate of 16% and also a case of multiple deep satellite lesions surrounding the original excised lesion in a case of Warner Wilson James syndrome have been reported. Velmann A\(^10\) said that there is a need for regular follow-up is also emphasized because of higher recurrence rate, especially in the gingiva.

Ortonne JP et al\(^11\) stated that sun exposure is known to be an important etiological factor in causing melasma, irrespective of sex. UV radiations increases proliferation and melanocyte activity, causing epidermal pigmentation, that occurs more intensely in melasmic areas with melasma than in unaffected skin.

Guinot C\(^12\) further substantiated by the findings that melasma usually improves during the winter and worsens during the summer months (or during other periods of intense sun exposure). Sarkar R et al\(^13\) found that prevalence is high in tropical regions and high elevation areas. Mahmoud BH\(^14\) recently reported infrared radiation and visible light have been found to cause melasma, although not as severely as UV radiation.

Sarkar R et al\(^13\) stated that according to the predominant localization of the lesions on the face, three patterns of facial melasma are recognized clinically: malar, centrofacial and mandibular. Centrofacial pattern type exhibits the forehead, upper lip, cheeks, nose and chin being affected, whereas the malar pattern distributes melasma on the cheeks and nose and the mandibular pattern covers the mandibular ramus. In this case report the patient presented with the centrofacial distribution of melasma.

According to Vázquez Me et al\(^15\) among men, the malar pattern is most common, representing 44.1 to 61 percent of male patients. The centrofacial variant is the second most common variant amongst men.

O’Brien TJ et al\(^16\) found that clinically, melasma is most commonly seen on the face, but melasma on other sun-exposed areas such as the arms, neck, sternal regions and back, have been seen in women. Extrafacial melasma affecting the upper body occurs mainly among elderly, menopausal women and might be associated with hormone replacement therapy.
Conclusion

This article seeks to report a PG in the maxillary gingiva with a skin disease (Melasma). Even though PG is a relatively common presentation, it is rare to find coinciding occurrence of pyogenic granuloma with melasma. Melasma has traditionally been considered to be a pigmentation disorder of the female sex, but the occurrence in men is not uncommon. Melasma has a multifactorial origin that is exacerbated by environmental factors such as sunlight, especially in those genetically predisposed to the condition. The etiopathogenesis of melasma in men is similar to that of women, except for hormonal factors, which are more prevalent in women.

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Conflicts of interest: There are no conflicts of interest.

Ethical Clearance: It is ethically approved by the ethical committee of Swami Vivekanand Subharti University.

References

Profile of Medico Legal Autopsies at Tezpur Medical College & Hospital, Tezpur, Assam: A One Year Retrospective Study

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Abstract: With the progress of human civilization there has been a marked development in every aspect of mankind which on the other hand has also resulted in increased number of deaths following unnatural causes. Medico legal autopsies thereby portray not only the causes of death but also reflect the socio economic and demographic profile of that particular region. The present study was conducted at Tezpur Medical College & Hospital, Tezpur, Assam to find out the various patterns of Medico legal autopsies during the period 1st January 2019 to 31st December 2019.

Keywords: Medico legal autopsies, deaths, unnatural, patterns.

Introduction

Autopsy/necropsy denotes examination of the dead body with a view to searching primarily for the cause of death. In 1302, a court in Bologna ordered the examination of one Azzolino, who had died under suspicious circumstances of alleged poisoning. [1] This procedure was carried out by two physicians and three surgeons, including Bartolomeo da Varignana. In the medico legal autopsy, the body belongs to the State for the protection of public interest until such time as a complete and thorough investigation into the circumstances attending the death has been completed. [2] Any or all portions of the body may be taken and kept for detailed examination as well as preserved for later trial purposes. [3] The increased numbers of unnatural deaths from road traffic incidents suggest an increase in the number of rash drivers without driving licenses, drinking and driving, lack of traffic rule knowledge, increased high speed vehicles and road conditions. Whereas deaths by suicide and homicide suggest that the mindset of the society is changing with increased intolerance, drug addiction, poverty and behavioral changes. [4,5] The present study is a retrospective study of the medico legal autopsies carried out at Tezpur Medical College & Hospital, Tezpur, Assam during the period 1st January 2019 to 31st December 2019 where a thread bare analysis was done as which age group, sex predominance, seasonal variation, socio economic condition, education, cause of death and nature of death the medico legal autopsies belong.

Material and Method

The study has been carried out in the Department of Forensic Medicine, TMCH, Tezpur from 1st January 2019 to 31st December 2019 by examination of the inquest report and dead body challan, personal interview of accompanying police, attendants of deceased, in case of hospitalized patients from hospital records and findings recorded in autopsy report of the various medico legal autopsies during that period. A total of 278 autopsies were carried out during 1st January 2019 to 31st December 2019.
Observation and Results

Incidence of male: female ratio. Out of the 278 cases 200 (71.94%) cases were of male and 78 (28.06%) were of female. Hence the male: female ratio was 2.6:1 which highlights a male preponderance.

Table No. 1: Age distribution of the cases.

<table>
<thead>
<tr>
<th>Age group</th>
<th>Number of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 10 years</td>
<td>9</td>
<td>3.2%</td>
</tr>
<tr>
<td>11 to 20 years</td>
<td>41</td>
<td>14.8%</td>
</tr>
<tr>
<td>21 to 40 years</td>
<td>121</td>
<td>43.5%</td>
</tr>
<tr>
<td>41 to 60 years</td>
<td>94</td>
<td>33.8%</td>
</tr>
<tr>
<td>More than 60 years</td>
<td>13</td>
<td>4.7%</td>
</tr>
<tr>
<td>Total</td>
<td>278</td>
<td>100%</td>
</tr>
</tbody>
</table>

From table 1 it is evident that most number of autopsies was done in the age group of 21 to 40 years followed by 41 to 60 years.

Table No. 2: Month wise distribution of the cases.

<table>
<thead>
<tr>
<th>Month</th>
<th>Number of cases</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>28</td>
<td>10.07</td>
</tr>
<tr>
<td>February</td>
<td>25</td>
<td>8.99</td>
</tr>
<tr>
<td>March</td>
<td>27</td>
<td>9.71</td>
</tr>
<tr>
<td>April</td>
<td>25</td>
<td>8.99</td>
</tr>
<tr>
<td>May</td>
<td>25</td>
<td>8.99</td>
</tr>
<tr>
<td>June</td>
<td>19</td>
<td>6.83</td>
</tr>
<tr>
<td>July</td>
<td>18</td>
<td>6.47</td>
</tr>
<tr>
<td>August</td>
<td>26</td>
<td>9.35</td>
</tr>
<tr>
<td>September</td>
<td>17</td>
<td>6.11</td>
</tr>
<tr>
<td>October</td>
<td>25</td>
<td>8.99</td>
</tr>
<tr>
<td>November</td>
<td>22</td>
<td>7.91</td>
</tr>
<tr>
<td>December</td>
<td>20</td>
<td>7.19</td>
</tr>
</tbody>
</table>

From table 2 it is found that most number of autopsies was conducted during the month of January and March.

Table No. 3: Educational qualification of the victims

<table>
<thead>
<tr>
<th>Educational qualification</th>
<th>Number of cases</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post graduate and above</td>
<td>21</td>
<td>7.55</td>
</tr>
<tr>
<td>Graduate</td>
<td>38</td>
<td>13.67</td>
</tr>
<tr>
<td>HS passed</td>
<td>47</td>
<td>16.91</td>
</tr>
<tr>
<td>Matriculate</td>
<td>45</td>
<td>16.19</td>
</tr>
<tr>
<td>Read up to class X</td>
<td>79</td>
<td>28.42</td>
</tr>
<tr>
<td>Illiterate</td>
<td>48</td>
<td>17.27</td>
</tr>
</tbody>
</table>

From table 3 it is found that most number of autopsies was conducted upon the victims who have read up to class X and illiterate.

Table No. 4: Cause of death

<table>
<thead>
<tr>
<th>Cause of death</th>
<th>Number of cases</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head injury</td>
<td>79</td>
<td>28.42</td>
</tr>
<tr>
<td>Burn injury</td>
<td>34</td>
<td>12.23</td>
</tr>
<tr>
<td>Hanging</td>
<td>45</td>
<td>16.19</td>
</tr>
<tr>
<td>Strangulation</td>
<td>03</td>
<td>1.08</td>
</tr>
<tr>
<td>Drowning</td>
<td>18</td>
<td>6.47</td>
</tr>
<tr>
<td>Electrocution</td>
<td>06</td>
<td>2.16</td>
</tr>
<tr>
<td>Natural cause</td>
<td>10</td>
<td>3.60</td>
</tr>
<tr>
<td>Hemorrhage and shock</td>
<td>35</td>
<td>12.59</td>
</tr>
<tr>
<td>Poisoning</td>
<td>46</td>
<td>16.55</td>
</tr>
<tr>
<td>Undetermined</td>
<td>02</td>
<td>0.72</td>
</tr>
</tbody>
</table>

From table 4 it is observed that 79 deaths were due to head injury followed by 46 deaths due to poisoning and 45 deaths due to hanging.

Table No. 5: Nature of death

<table>
<thead>
<tr>
<th>Nature of death</th>
<th>Number of cases</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accidental</td>
<td>136</td>
<td>48.92</td>
</tr>
<tr>
<td>Suicidal</td>
<td>103</td>
<td>37.05</td>
</tr>
<tr>
<td>Homicidal</td>
<td>24</td>
<td>8.63</td>
</tr>
<tr>
<td>Natural cause</td>
<td>10</td>
<td>3.60</td>
</tr>
<tr>
<td>Pending investigation</td>
<td>05</td>
<td>1.80</td>
</tr>
</tbody>
</table>

From table 5 it is observed that 136 deaths were accidental deaths followed by 103 deaths of suicidal origin.
Discussion

In our study out of the 278 autopsies 200 (71.94%) were of the male sex whereas 78 (28.06%) were of the female sex which is similar to the study carried out by Kishwar Naheed et al.\[6\]. The male preponderance of unnatural deaths may be attributed to the fact that males outnumber females in the general population in our state and also males lead a more stressful life than females carrying the responsibilities of the family and social lives and thereby make themselves more vulnerable.

From table 1 it is evident that most number of autopsies was done in the age group of 21 to 40 years followed by 41 to 60 years. The higher incidence of unnatural deaths in the young adult stage may be due to the fact that this is the period when they are by nature, trend to be more emotional, irrational and more aggressive and intolerant, thus making themselves more vulnerable to quarrels, commotion and instabilities of life.\[7,8\] Again, it is the time when man starts serious thinking to build oneself, one’s own family and society. So, when one does not get sufficient co-operation from the significant ones or if one faces repeated hurdles towards the goals, becomes frustrated which may result in the emotional outburst leading to quarrels, commission suicide, murder and accidental deaths.

From table 2 it is found that most number of autopsies was conducted during the month of January and March. The higher number of cases during the winter may be explained as most deaths were of accidental in origin due to low visibility during night time as a result of fog with indulgence in alcohol during driving.

From table 3 it is found that most number of autopsies was conducted upon the victims who have read up to class X and illiterate. The higher rate of people in this category may be attributed to the fact that most of them were leading a life style which requires much travelling to attend their work places which in turn makes them more vulnerable to accidents. More over lacking knowledge about road safety rules and indulgence in intoxicating substances are more common in this category which may be an important factor.

From table 4 it is observed that 79 deaths were due to head injury followed by 46 deaths due to poisoning and 45 deaths due to hanging. As head is most exposed vital region of the body it is more susceptible for injury and thereby death. Again as a result of advancement of the society and materialistic approach towards human life frustrations are likely to be present amongst the masses which may compel them to commit suicide.

From table 5 it is observed that 136 deaths were accidental deaths followed by 103 deaths of suicidal origin.\[7\] With the rapid process of human development machineries have become a part and parcel of our daily lives which may be either in the field of transport or industry thereby we are more susceptible to accidental deaths. Moreover due to increased level of stress and expectations in present day mankind suicidal deaths are also on an increasing trend.

Conclusion

The present study is an effort to evaluate the patterns of various medico legal autopsies from the view of Forensic Medicine personnel as to the cause, mode and nature of deaths and the socio demo graphic profile of the victims which in turn will be helpful in expediting methodologies for the policy makers and the society at large in prevention of unnatural deaths.

Ethical Clearance: Taken

Conflict of Interest: None declared

Source of Funding: None declared

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Abstract

Periodontal disease is a chronic inflammatory disease caused by colonization of bacteria that affects soft tissues and hard tissues that support the teeth. Inflammation and rejuvenation of alveolar bone are signs of periodontal disease. Fibroblasts also play a role in producing and maintaining extracellular matrix, cell proliferation and cell differentiation in response to prolonged tissue injury and chronic inflammation. The components of water hyacinth are very beneficial for health such as phenols, alkaloids, flavonoids, tannins. This study aimed to determine the concentration of EcengGondok leaf extract which can maintain the viability of human gingival fibroblast cells for 24 hours. The method human gingival primary cell culture was harvested, placed on a 96-well microplate. Each well on the microplate was given water hyacinth leaf extract with a concentration of 1 mg/ml, 0.5 mg/ml, 0.25 mg/ml, 0.125 mg/ml, 0.0625 mg/ml, 0.0312 mg/ml, 0.0156 mg/ml for 24 hours. MTT assay was carried out by adding MTT solution after 24 hours of incubation. Formazan optical density values are read by ELISA reader with a wavelength of 590 nm, viability is obtained by calculating the viability formula. Results are viability of human gingival fibroblast cells was good starting in the treatment group 0.125 mg/ml, 0.0625 mg/ml, 0.0312 mg/ml and 0.0156 mg/ml. Conclusion the highest viability of human gingival fibroblast cells in the treatment group of 0.0156 mg/ml was 75.98%.

Keywords: Water Hyacinth leaf extract, human gingival fibroblast cells, viability, MTT assay.

Introduction

Periodontal disease is a chronic inflammatory disease caused by colonization of bacteria that affects soft tissues and hard tissues that support the teeth. According to the results of the 2013 Basic Health Research (RISKESDAS), 25.9% of the population in Indonesia had problems with dental and oral health including periodontal disease, this number increased when compared to the results of Basic Health Research in 2007 which was 23.2%.\(^1\)

In the case of periodontitis bone reasorbition will be seen in the roastenology examination. One of the basic therapies that can be given in cases of periodontal disease is scaling and root planing, surgical intervention therapy and also given materials that can accelerate the regenerative process of cells that have been damaged.\(^2\)

Fibroblasts are the most common cells found in connective tissue throughout the body including the oral cavity and are the main source of extracellular matrix fibroblasts also play a role in producing and maintaining extracellular matrix. Fibroblasts play an important role in the wound healing process which is a response to injury and tissue.\(^3\)

In several studies, phytokomia of water hyacinth leaf

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extract has proven that there are components in water hyacinth which are very beneficial for health such as phenols, alkaloids, flavonoids, tannins and essential oils (squalene). These components can act as antimicrobial, antioxidant, anticancer, antitumor and for the wound healing process.

The use of plant extracts as an alternative in the health sector should have very minimal side effects, are not toxic, do not cause allergies, are not cynogenic and do not cause complications in the body. Therefore, the use of plant extracts must be tested first, one of which is by viability testing in accordance with the terms and material in the field of dentistry.

The viability test is a cell-based test that is often used for screening compounds to determine whether the test compound has an effect on cell proliferation or shows a direct cytotoxic effect that ultimately causes cell death.

Various tetrazolium compounds have been used to detect living cells. The commonly used compound is MTT (3-(4,5-dimethylthiazol-2-yl)-2,5 diphenyltetrazolium bromide). In this study human gingival fibroblast cells were used because fibroblast cells are the most important cells in human periodontal tissue. This study aimed to determine the concentration of EcengGondok leaf extract which can maintain the viability of human gingival fibroblast cells for 24 hours.

Material and Method

This type of research is a laboratory experiment with the design of The Post-Test Only control group design. This research was conducted in the Stem Cell Institution of Tropical Disease (ITD) and Laboratory of the Faculty of Pharmacy, Airlangga University.

The tools and materials used are microscopy micro light, multichannel pipette 25 µl, shacker with magnetic stirrer, ELISA reader, scales, test tubes and shelves, rotary evaporator, grinder, filter paper, glass gourd, auctoclave, measuring cup, incubator, centrifuge, Buchner funnel, laminar flow, BIOH-T Proline micropipette 20-200 µl, bottle Roux, conical tube ep. TIPS 200µl, 96-well Falcon 3072 plate, water hyacinth leaf extract (Eichornia Crassipes), human gingival cell lines, culture media containing Alfa Modified Eagles Medium (αMEM), dimethyl sulfoxide (DMSO), ready-to-use MTT liquid, phosphate buffer saline (PBS), 10% SDS in 0.1 NHCL, 70% ethanol, sterile distilled water, trypsin versene.

Making Hyacinth Leaf Extract: Water hyacinth leaves are aerated for about seven days until dry. After drying, then grinding is done using a grinder to get 40 mesh of water hyacinth powder granule, as much as 500 grams of water hyacinth leaves macerated with 1000 ml ethanol solvent, then stirred with a stirrer for 24 hours then filtered using whatmann paper No. 40 which is placed on a Buchner funnel and obtained by filtrate, then centrifuged at 9000 rpm at 4 oC for 15 minutes, the sediment obtained is then evaporated using a rotary evaporator at 60 oC, evaporation above the waterbath, evaporation results then evaporated again until there is no residual ethanol content.

Stage of Fibroblast Cell Management: Gingival tissue was taken from free gingiva in tooth P1 for extracted orthodontic treatment, gingival tissue was washed with physiological solution to clean from blood, then placed in a transport medium to be taken to the laboratory, gingival tissue washed 3 times with PBS containing penicillin and streptomycin antibiotics to avoid the possibility of bacterial contamination. The gingival tissue was cut to approximately 1mm3 and covered with deckglass, then collagenase was added for 30 minutes at 37oC, then the tissue was washed and centrifuge for 6 minutes, then the cells obtained were cultured with a growing and incubated medium in a 5% CO2 incubator with a temperature of 37oC for 3 days.

Stage of Fibroblast Cell Culture: Primary human gingival fibroblast cell culture in the Alpha Modified Eagle’s Medium (αMEM). Culture was added with 150 µg/ml Fetal Bovine Serum (FBS) 10%, 10 µg/ml Fungizone 0.5%, 100 µg/ml 2% Citrate, confluent cells then dipasase to be propagated, cell medium removed, then washed with PBS, the cell is released with a 2 ml trypsin enzyme, then incubated safely 5 minutes at 37oC and 5% CO2, after the cell is removed then added a stopper and resuspended, centrifuged 25000 rpm for 6 minutes, pellets are planted on a 10 cm plate with αMEM medium.

Harvesting Cells: The cell growth medium is washed with PBS 10% as much as 5 mL to remove protein in the medium, PBS is removed using an aspirator with a wash movement, 25% trypsin as much as 2 mL is inserted to detach cells from the surface of the plate, put in an incubator for 5 minutes with temperature of 37oC and 5% CO2, cell conditions were observed with a light microscope to see cell distribution, human gingival fibroblast cells were taken from CO2 incubators.
then cell conditions were observed (80% confluent cell cultures were used for harvesting), cells were harvested according to harvest protocols. Cells are seen using a microscope. The container is tapped so that the cell is floating.

**Results**

According to the results of reading OD (Optical Density), the average results of the research shown in table 1 are obtained.

**Table 1: Absorbance results in the treatment group extracts of water hyacinth leaves for 24 hours.**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media Control</td>
<td>6</td>
<td>0.087</td>
</tr>
<tr>
<td>Cells Control</td>
<td>6</td>
<td>0.647</td>
</tr>
<tr>
<td>Concentration 1 mg/ml</td>
<td>6</td>
<td>0.168</td>
</tr>
<tr>
<td>Concentration 0.5 mg/ml</td>
<td>6</td>
<td>0.318</td>
</tr>
<tr>
<td>Concentration 0.25 mg/ml</td>
<td>6</td>
<td>0.362</td>
</tr>
<tr>
<td>Concentration 0.125 mg/ml</td>
<td>6</td>
<td>0.428</td>
</tr>
<tr>
<td>Concentration 0.0625 mg/ml</td>
<td>6</td>
<td>0.441</td>
</tr>
<tr>
<td>Concentration 0.0312 mg/ml</td>
<td>6</td>
<td>0.463</td>
</tr>
<tr>
<td>Concentration 0.0156 mg/ml</td>
<td>6</td>
<td>0.513</td>
</tr>
</tbody>
</table>

Based on the results of the study it can be seen that the average value of the absorbance of the cell control group for 24 hours is 0.647. The lowest absorbance of the group of extracts of water hyacinth leaves at a concentration of 1 mg/ml of 0.168 and the average absorbance of the group of extracts of water hyacinth leaves was highest at a concentration of 0.0156 mg/ml of 0.513.

**Table 2 Persent as eselhidupkelompokperlakuanek-strakecenggondokselama 24 jam**

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Percentage of Live Cells (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mg/ml</td>
<td>14,395</td>
</tr>
<tr>
<td>0.5 mg/ml</td>
<td>41,094</td>
</tr>
<tr>
<td>0.25 mg/ml</td>
<td>49,012</td>
</tr>
<tr>
<td>0.125 mg/ml</td>
<td>60,858</td>
</tr>
<tr>
<td>0.0625 mg/ml</td>
<td>63,061</td>
</tr>
<tr>
<td>0.0312 mg/ml</td>
<td>67,050</td>
</tr>
<tr>
<td>0.00156 mg/ml</td>
<td>75,979</td>
</tr>
</tbody>
</table>

**Graphic 1: Percentage of Live Cells**

**Statistical Analysis:** The measurement results are tabulated according to each group sample, followed by testing the normal distribution using the Kolmogorov Smirnov Test with Sig>0.05. It can be concluded that the data are normally distributed, then homogeneity testing using Levene’s Test with Sig.<0.05 can be concluded that data is not homogeneous. After that, statistical tests were carried out using Kruskal Wallis at the significance level of Sig.<0.05 and significant differences were obtained, then continued by performing multiple comparisons using Mann-Whitney which concluded that all groups had significant differences except the concentration group 0.25 mg/ml against 0.125 mg/ml; 0.0625 mg/ml; 0.0312 mg/ml, concentration of 0.125 mg/ml against 0.0625 mg/ml; 0.0312 mg/ml, concentration of 0.0625 mg/ml against 0.0312 mg/ml.

**Discussion**

Water hyacinth is a plant that floats on the surface of the water (weeds) that can develop roots in the mud in shallow water which eventually becomes waste because it can grow wildly on the surface of the water so that it disturbs the growing ecosystem, according to some studies water hyacinth contains several substances that can help proliferation from the cell. Then in this study using fibroblast cell cultures from human gingiva where fibroblast cells play an important role in the wound healing process. Cell culture has several advantages,
namely high cell growth speed, cell integrity is maintained and cells are able to multiply in suspension.

Research on the viability test of water hyacinth leaf extract was carried out to determine the viability of water hyacinth leaf extract on human fibroblast cells, because in the field of dentistry it requires a healing process so that each material used must meet several requirements, one of which is not having a detrimental or toxic effect on the biological environment both local and systemic. Therefore the viability test is conducted to see the level of biocompatibility of a material, one of the method is by enzymatic testing with MTT reagent (3-(4,5-dimethythiazol-2-yl)-2,5-di-phenyl-tetrazolium bromide).10

This tetrazolium salt dissolves in water and produces a yellow solution, living cells can reduce MTT, while dead cells cannot reduce MTT because the enzymes in the cell no longer function 11. The basic principle is the work of mitochondrial enzymes in active cells that metabolize tetrazolium salts, so that the tetrazolium ring is broken by the dehydrogenase enzyme which causes the tetrazolium to turn into insoluble and purple formazan. Color changes are caused by tetrazolium salts being reduced by the metabolic activity of cells that form NADH or NADPH. This purple color will be measured by its absorbance, absorbance is the ratio of the intensity of light absorbed to the intensity of light that comes using a certain wavelength. The absorbance value can be said to be directly proportional to the concentration of substances contained in it, namely the more levels of substances contained in a sample, the more molecules that absorb light, the greater the absorbance value.12

Based on the results of the research in table 1, the absorbance results of the treatment group of water hyacinth extract for 24 hours and cell control and media control for comparison were obtained, the average value of the absorbance of the treatment group. Absorbance value is used to determine percent cell viability, if the absorbance value observed is smaller than the absorbance value of the control group, then the cell undergoes reduction or in other words the cell’s ability to proliferate is low. Conversely, when the absorptive value is higher than the control, the ability of cells to proliferate is high, if the level of proliferation is too high it can cause death from cells because of the possibility of changes in cell morphology.13

A material cannot be said to be toxic if the percentage of living cells after exposure to the sample is more than 50% which is in accordance with CD50. Statistically, the comparison of the control group with the treatment group 1 mg/ml, 0.5 mg/ml, 0.25 mg/ml, 0.125 mg/ml, 0.0625 mg/ml, 0.0312 mg/ml, 0.0156 mg/ml had a significant difference. From the results of the percentage of live cells it can be seen that the optimum dose of the treatment group extract of water hyacinth leaves for 24 hours is 0.0156 mg/ml.12

Based on phytochemical tests and several scientific studies regarding extracts of water hyacinth leaves contain several substances, namely flavonoids, alkaloids and tannins. Where alkaloids play a role in increasing regulation of various types of cytokines, namely TGFβ1, CTGF, PDGF, where the three cytokines function to control cell proliferation including fibroblast cells during the wound healing process. TGFβ1 is responsible for inducing fibrosis by encouraging HSCs to differentiate into miofibroblasts and increasing TIMPs. CTGF is produced by macrophages which will produce a profibrotic signal which causes stimulation of the proliferation of collagen which will produce HSCs.14

Flavonoids that act as antioxidants that inhibit the increase of oxidative stress on body cells, when flavonoids are absorbed usually there will be an increase in several biological functions including protein synthesis, cell differentiation and cell proliferation and angiogenesis. Then there is tannin which neutralizes proteolytic enzymes with the help of TGFβ1 which will cause an increase in TIMPs which will inhibit degradation of the extracellular matrix and directly support the occurrence of fibrillar collagen interstitial synthesis. Which will later facilitate cell growth by preparing the environment of cells that will regenerate.15,16

**Conclusion**

Viable hyacinth leaf extract against fibroblast cells, treatment with a concentration of 0.0156% with a percentage above 75.98%.

**Conflict of Interest:** There is no conflict of interest.

**Source of Funding:** This study is self funded

**Ethical Clearance:** This study was approved by Ethical Comission of Health Research faculty of Dentistry, University of Airlangga.
References


15. Budi HS, Kriswandini IL, Sudjarwo SA. Ambonese banana stem sap (Musa paradisiaca var. sapientum) effect on PDGF-BB expressions and fibroblast proliferation in socket wound healing. Int J Chemtech Res. 2016;9(12):558–64.

The Relation of Mixed Marketing with Patient Loyalty in Syekh Yusuf Gowa General Hospital

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It is important for hospitals to have the right marketing strategy, with marketing programs conducted can improve the quality of service, with good service quality, it will be able to satisfy customers so that customers will be loyal. This study aims to determine the relationship between the mixed marketing with patient loyalty in the Syekh Yusuf Gowa Regional Hospital. This type of research is an observational study with a cross sectional study approach. The population in this study were all inpatients who used services at the SyekhGowa Regional General Hospital in a month. The sampling method was done by accidental sampling, which is 114 respondents. Data analysis in this research was carried out by testing hypotheses through the correlation test method. Bivariate analysis with correlation test shows that there is a relationship between the mixed promotion (P = 0.000), mixed service provider (P = 0.000), mixed physical facility (P = 0.012) and patient loyalty, but there is no relationship between the mixed process (P = 0.064) with patient loyalty. So, there is a relationship between the mixed marketing of promotion, mixed marketing of service presenters, mixed marketing of physical facilities and patient loyalty.

Keyword: Relation, mixed, marketing, patient, loyalty.

Introduction

The mixed marketing is a company’s tool to obtained the desired response from the target market, but more importantly is how to understand the mixed marketing from the customer’s perspective or perception\[1\]. If consumer perceptions of the quality of services provided are good, it will be able to increase customer or patient satisfaction. The impact of customer satisfaction is customer loyalty\[2\]. Customer loyalty is a loyalty that is shown by regular buying behavior in the long run through a series of customer decisions. Increased customer loyalty can lead to higher profitability and a more stable financial base\[3\].

Previous studies on the effect of patient perceptions and quality of doctor services on patient loyalty in Semarang showed that patients’ perceptions of doctors were not good and patient loyalty was lacking\[4\].

Based on the data on the number of inpatient visits to Syekh Yusuf Gowa Hospital in 2011, the number of patient visits decreased significantly by 12,398 patients\[5\]. By looking at these conditions, it is important for hospitals to have an appropriate marketing strategy, the marketing programs are efforts to improve the service quality. Therefore, the study wanted to find out the relation between mixed marketing and patient loyalty at Inpatient Hospital Syekh Yusuf Gowa.

Materials and Method

This type of research is an observational study with a cross sectional study approach. This research was conducted at Syekh Yusuf Regional General Hospital on February 14 - March 14, 2012. The population in this study were all inpatients who used services at Syekh Yusuf Gowa Regional General Hospital. The method of sampling with non-random sampling system is accidental sampling, which has 114 respondents.

Primary data were obtained by collecting questionnaires while secondary data were obtained through literature studies and related agencies. Data management using the SPSS program and presented in tabular form. Data analysis in this study was carried out through the Pearson correlation test using a p value of 5% or 0.05. If p value ≤ 0.05, then Ho is rejected, meaning that there is a significant relation between the independent variable and the dependent variable. If p value ≥ 0.05, then Ho is accepted, meaning that there is no significant relation between the independent variable and the dependent variable.
Results

Table 1: Distribution of Respondents

<table>
<thead>
<tr>
<th>No.</th>
<th>Respondents Characteristic</th>
<th>Category</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Gender</td>
<td>Men</td>
<td>46</td>
<td>40,4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Women</td>
<td>68</td>
<td>59,6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quantity</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>2.</td>
<td>Age Group</td>
<td>10-14</td>
<td>1</td>
<td>0,9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15-19</td>
<td>10</td>
<td>8,8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20-24</td>
<td>12</td>
<td>10,5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25-29</td>
<td>18</td>
<td>15,8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30-34</td>
<td>20</td>
<td>17,5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≥35</td>
<td>53</td>
<td>46,5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quantity</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>3.</td>
<td>Background Education</td>
<td>Elementary School</td>
<td>38</td>
<td>33,3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Junior High School</td>
<td>20</td>
<td>17,5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Senior High School</td>
<td>39</td>
<td>34,2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D1-D3 Diploma</td>
<td>6</td>
<td>5,3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D4-S1 Bachelor</td>
<td>11</td>
<td>9,6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quantity</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>4.</td>
<td>Occupation</td>
<td>Government employees/army/</td>
<td>9</td>
<td>7,9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>police</td>
<td>5</td>
<td>4,4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Private employee</td>
<td>14</td>
<td>12,3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Farmers/fisherman</td>
<td>61</td>
<td>53,5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Housewife</td>
<td>25</td>
<td>21,9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unemployed/Students</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quantity</td>
<td>114</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary Data

Table 1 shows that the majority of female respondents were 68 respondents (59.6%), aged >= 35 years as many as 53 respondents (46.5%), had a high school education of 39 respondents (34.2%) and worked as a Housewife as many as 61 respondents (53.5%).

Table 2: Variable Distribution

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Category</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Loyalty</td>
<td>Loyal</td>
<td>108</td>
<td>94,7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Less Loyal</td>
<td>6</td>
<td>5,3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quantity</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>2.</td>
<td>Promotion</td>
<td>Good</td>
<td>96</td>
<td>84,2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fair</td>
<td>18</td>
<td>15,8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quantity</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>3.</td>
<td>Service presenters</td>
<td>Good</td>
<td>111</td>
<td>97,4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fair</td>
<td>3</td>
<td>2,6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quantity</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>4.</td>
<td>Physical facilities</td>
<td>Good</td>
<td>104</td>
<td>91,2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fair</td>
<td>10</td>
<td>8,8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quantity</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>5.</td>
<td>Process</td>
<td>Good</td>
<td>107</td>
<td>93,9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fair</td>
<td>7</td>
<td>6,1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quantity</td>
<td>114</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary Data
Table 2 shows that loyal patients were 108 patients (94.7%), patients’ perceptions of good promotions were (84.2%), patients’ perceptions of good service providers were (97.4%), patients’ perceptions of good physical facilities (91.2%) and patient perceptions of good processes (93.9%).

Table 3: Pearson Correlation Test Relation between Mixed Marketing and Patient Loyalty

<table>
<thead>
<tr>
<th>No.</th>
<th>Mixed Marketing Variable</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Promotion</td>
<td>0.000</td>
</tr>
<tr>
<td>2.</td>
<td>Service Presenters</td>
<td>0.000</td>
</tr>
<tr>
<td>3.</td>
<td>Physical Facilities</td>
<td>0.012</td>
</tr>
<tr>
<td>4.</td>
<td>Process</td>
<td>0.064</td>
</tr>
</tbody>
</table>

Source: Primary Data

Table 3 shows that there is a relationship between the mixed promotion (P = 0.000), mixed service provider (P = 0.000), mixed physical facility (P = 0.012) and patient loyalty because it has a p value less than 0.05 while the mixed process (P = 0.064) does not have a relation with patient loyalty because it has a p value greater than 0.05.

Discussion

The results showed that respondents who had a good perception about the mixed promotion had a higher percentage of 96 respondents (84.2%) and the statistical test results showed a p value (0.00) ≤ 0.05 which meant that there was a relation between the mixed promotion and patient loyalty. The results of this study also showed that respondents who had a good perception of the mixed service presenters were higher, namely 111 respondents (97.4%) and the statistical test results showed a p value (0.00) ≤ 0.05, which means there was a relationship between the mixed service presenters with patient loyalty. For the mixed physical facility variable, this study shows that respondents who have a good perception about the mixed physical facility have a higher percentage of 104 respondents (91.2%) and the statistical test results show p (0.012) ≤ 0.05 which means there is a relation between the mixed physical facility with patient loyalty. For the mixed process variable, respondents who have a good perception of the mixed process percentage are higher namely 107 respondents (93.9%) where the statistical test shows p (0.064) ≥ 0.05 which means there is no relation between the mixed process and patient loyalty.

The elements of physical facilities assessed by customers include exterior attributes (such as parking...
lots, parks, directions) and interior attributes (such as decoration, equipment, lay out)\[^{10}\]. The primary data obtained shows that one of the toilets in the hospital was clean and smells well, this is in accordance with the opinions of respondents who mostly agreed. Besides that, one of the secondary evidences at Syekh Yusuf Regional Hospital is quite good and complete with the availability of supporting facilities such as ATMs and canteens so that patients are interested in coming back. This illustrates that there is a relation between the mixed physical facilities and the patient loyalty in hospitalization. The results of this study are in line with previous studies in Makassar which state that there is a relation between physical facilities and patient loyalty. Customers often see physical evidence to evaluate services obtained before and after consuming the services\[^{7}\]. This research is also in line with the theory of Rambat Lupiyoadi, who concluded that the physical environment where services are created directly interacts with the customer and is interconnected. Based on this description, the management should pay attention to the facilities needed by patients in order to be added value.

The process includes the service process, including the stages through and the room lay out. The same service results can be different in value if the process is different\[^{11}\]. The primary data above stated generally well in the mixed process of 107 people (93.9%) but the correlation value ie p value indicates that there was no relation. The results of this study are not in line with previous studies conducted by Sari in 2009 which stated that the service process influences loyalty because it relates to how the service is provided to patients, although most of the patients’ perceptions are good but there are still many patients who complain of the long waiting time at the clinic, this condition can encourage patients to try services in other hospitals so that loyalty will decrease\[^{12}\].

**Conclusion and Recommendation**

The conclusion of this study is the relation between the mixed marketing promotion, mixed marketing service providers, mixed marketing physical facilities with patient loyalty in Inpatient Hospital Syekh Yusuf Gowa. However, there is no relation between the mixed process and the loyalty of patients in the Syekh Yusuf Gowa Regional Hospital.

Suggestions for management to improve the quality of services in Inpatient, especially for the process of focusing on patient satisfaction and establishing good communication with patients so as to increase patient loyalty to Syekh Yusuf Hospital. In addition, the Regional General Hospital of Syekh Yusuf is expected to further improve the service process that satisfies patients, such as improving service procedures and improving all activities in hospital. In further research, it is necessary to discuss other mixing variables which is not examined in this study. In addition, research efforts on the relation between mixed marketing and patient loyalty need to be increased.

**Source of Funding:** Author

**Conflict of Interest:** No

**Ethical Clearance:** Yes

**Reference**


Cardiac Ventricle Laceration in a Battered Child: A Case Report

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Abstract

Cardiac laceration in child abuse cases is uncommon. Very few case studies are available illustrating the left ventricular rupture following blunt chest injuries. This article presents a case of sudden death of a two and a half year-old female child brought with history of fall on level ground while playing. The autopsy revealed multiple types of injuries over the whole body with duration varying from less than a day to more than 6 months old. Left ventricular rupture and liver laceration were the primary injuries contributing to death. Child abuse cases should never be examined with a preconception of finding the classical features of intracranial hematomas.

Keywords: Child abuse, left ventricular rupture, heart rupture, cardiac tamponade, autopsy, shaken baby syndrome, blunt cardio-thoracic injury.

Introduction

Ever since the first case of ‘Battered baby syndrome’ was described, child abuse cases are increasingly reported in clinical practice. Newer ways of violence against the child are often encountered. The classical description of ‘Battered baby syndrome’ i.e. due to shaking being the commonest¹,² to less common causes like beaten to death by parents or caregivers³, homicidal methanol poisoning⁴, homicidal snake bite⁵, intestinal perforations⁶, hypodermic needle insertion at various body parts of the child⁷. Very few articles are available depicting the use of less common method of child exploitation with an unusual outcome. The present case discusses the cardiac complications of blunt thoracoabdominal trauma in a child abuse victim.

Case Report:

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A two and half year old girl child was brought for autopsy at our institution (Fig.1). History provided by the investigating officer was similar to the history narrated by the mother of child. As per the alleged history, child was playing inside her home along with her two elder brothers, suddenly fell on the ground and became unconscious. The mother tried to wake up the child by shaking off and by splashing water on face but child was unresponsive. Father was a truck driver by profession and was out of station for work. The child was brought to a nearby hospital within 1 hour of the incident. The primary care physician after complete examination declared the child brought dead on arrival. Police were intimated and forensic medicine opinion was sought regarding the case. As per the hospital papers provided with the inquest reports, there was no documentation of attempted cardio-pulmonary resuscitation or any external injury over the exposed parts of the body. Mother gave negative history of any congenital or acquired disease or previous hospitalization. But she admitted to history of frequent falls of child while playing sustaining recent swelling over the forehead and few old scratches over the limbs. As per mother, child was playful, social and never had a similar incident in the past.

The sudden death of an apparently healthy, playful child within 1 hour of incident and negative history of any disease was sufficient for suspicion of child abuse. An autopsy was performed including external examination, internal examination, toxicological analysis of blood and full-body x-ray.

External examination revealed sunken eyes, prominent bony margins, loss of subcutaneous fat and improper pigmentation. There were a total of 43 injuries over the front and back of the body which was of different types, sizes and ages. Out of all, 18 injuries were under 12 hours of duration prior to death and included bruises over the forehead, chest, back, and laceration on the inner surface of the lower lip. Multiple, comparatively large, bruises were present over the sternal area of the chest which were individually and/or collectively responsible for the cause of death (Fig.2). Multiple reddish tram-track bruises were present over the entire back and thighs, suggestive of being caused by a long, slender object.

Six equal-sized circular injuries of duration more than 1-week old were present at different parts of the body, suggestive of being caused by the burning end of cigarette or bidi or with material alike. Few old injuries were also present in the perineal region. The rest of the injuries were old scar marks and their duration varied from 2 weeks to more than 6-month.

Internal examination revealed contusion over the anterior half of the scalp without skull fracture. Thin patches of subarachnoid haemorrhages were present all over the brain. The brain was pale and showing features of oedema. Antemortem fracture of 4th and 5th rib of right side was present 1 cm lateral to the costochondral junction. Multiple ecchymotic patches were present in the surrounding soft tissues of heart and pleural surface of both lungs. Pericardial cavity contained about 100ml of liquid and clotted blood (Fig.3a). A 4cm, full-thickness, antemortem lacerated wound was present on the posterior wall of left ventricle (Fig.3b). Ecchymotic patches were present over the anterior surface of heart, root of aorta and near right auricle. Even though the body was emaciated but abdomen was distended. The incision revealed profuse flow of liquid and clotted blood which was approximately 500ml in volume. The Source of blood was searched for, which revealed contusion over the posterior surface of right lobe of liver along with two lacerations near caudate lobe (Fig.3c). Peri-nephric area of right side was contused along with reduced fat deposit.

Blood sample was collected and sent to forensic science laboratory for toxicological analysis whose report is still awaited, although stomach content did not reveal any unusual finding. X-ray did not show any recent or healing fracture of skull or long bones.
Discussion

In our present case, most of the findings are more in favor of blunt thoracoabdominal trauma. Various literature search guides us that the following cause could be attributed to the death of this child, commotio cordis\(^8\), right atrium rupture\(^9\), left ventricular rupture\(^10\), traumatic ventricular septal defect\(^11\), trauma-induced intra-cardiac thrombus\(^12\) and trauma-induced transection of abdominal aorta or spinal injuries\(^13\).

Since external examination revealed multiple bruises over the sternal area along with fracture of right side ribs and no injuries over the abdomen, death of the child could be ascribed more to chest injury rather than abdominal. Among the above-mentioned causes, right atrial rupture was less likely because the most accepted mechanism causing it is increased hydrostatic pressure subsequent to abdominal trauma. Trauma to abdomen transmits the hydrostatic force to right atrium through inferior vena cava. When the hydrostatic force exceeds the stretchability of right atrium, it results in rupture. However, liver laceration can occur either from a blow over the chest or abdominal\(^9\). Cardiopulmonary resuscitation (CPR)\(^14\) could be a valid reason for bruises over the sternal area. Since the child was brought dead to hospital and hospital records also did not mention any attempt of CPR so this aspect was ruled out. A high-quality CPR usually causes fracture of left side ribs but in the present case, ribs were fractured on the right side again disproving the concept of CPR attempt.

A similar case of child abuse has been reported\(^10\) describing life-threatening left ventricular rupture after blunt chest injury. The autopsy noted multiple bruises all over the body including genitals. Full-thickness laceration was present at the left ventricular apex with 150ml of blood in the pericardial cavity. Multiple fractures of both sided ribs and laceration of right liver lobe were present. The author opined that the resultant cardiac injury could be due to thoracoabdominal injury. The possibility of abdominal trauma was disregarded because there was no associated injury to inferior vena cava or right side of the heart, caused due to increased hydrostatic
pressure. The likelihood of thoracic trauma was also less convincing because two contradictory opinions were present regarding the same. A severe blow to the chest during end-diastolic phase of cardiac cycle, when the ventricles are full and atria empty, could cause the rupture of ventricles by raising the hydrostatic pressure to an extreme degree. But at the same time outflow tract of ventricles with one-way valve mechanism also reduces this pressure lowering the chance of tear. Furthermore, the overlying sternal injuries were concomitant or due to previous trauma remained uncertain. Crushing of heart apex between sternum and vertebral column was the best-suited mechanism for ventricle rupture.

Although the mechanism described for left ventricle rupture in the above case was contradictory but it was arguable for our case. In the present case, several findings were appreciable which guided towards a thoracic blow rather than abdominal. Multiple fresh bruises over the sternal area, right side rib fractures, ecchymotic patches over the anterior surface of heart, root of aorta and right auricle, all suggested repeated trauma over the chest simultaneously obstructing the outflow tract of ventricles and intensely increasing the intra-ventricular hydrostatic pressure resulting in rupture of left ventricle and liver. Alternatively, rupture due to compression grinding of the left ventricle between sternum and vertebral column cannot be denied.

**Conclusion**

Child abuse cases should never be examined with a preconception of finding the classical features of intracranial hematomas. Cardiac lacerations are the newly described variant of blunt cardio-thoracic injuries in cases of child abuse which are less common than cardiac concussion injuries but nevertheless encountered in clinical practice.

**Conflict of Interest:** There is no conflict of interest to declare

**Source of Funding:** None

**References**


Biomarkers in Orthodontics: An Overview

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Abstract

A biomarker is a substance that is measured and evaluated objectively as an indicator of normal biologic processes, pathogenic processes, or pharmacologic responses to a therapeutic intervention. Tooth movement by orthodontic treatment is characterized by remodelling changes in the periodontal ligament, alveolar bone and gingiva. A reflection of these phenomena can be found in the gingival crevicular fluid (GCF) of moving teeth, with significant elevations in the concentrations of its components like, cytokines, neurotransmitters, growth factors and arachidonic acid metabolites. Knowledge of biomarkers present in the GCF may be of clinical use leading to proper choice of mechanical stress for better orthodontic treatment and lesser side effects.

Keywords: Biomarkers, orthodontic tooth movement, gingival crevicular fluid.

Introduction

Orthodontic treatment aims at the correction of dental irregularities and disharmony in jaw relations. Tooth movement induced by orthodontic force application is characterized by remodelling in the dental and periodontal tissues.¹ Orthodontic tooth movement (OTM) is characterized by abrupt creation of compression and tension in periodontal ligament (PDL) (Goutoudi, Diza et al. 2004). These force-induced strains alter the PDL vascularity and blood flow, resulting in local synthesis and release of various key molecules, such as neurotransmitters, cytokines, growth factors, colony-stimulating factors and arachidonic acid metabolites. These molecules can evoke many cellular responses by various cell types in and around teeth, providing a favourable micro-environment for tissue deposition or resorption (Simonet, Lacey et al. 1997; Cetin, Buduneli et al. 2004). Gingival crevicular fluid (GCF) contains inflammatory products, bacterial products and products of tissue break down. Noninvasive procedures to determine the changes in salivary constituents are used to diagnose several diseases in clinical medicine. Thus, examination of GCF is an ideal method of evaluating the tissue destruction during orthodontic treatment. GCF arises at the gingival margin and can be described as a transudate or an exudate. Clinically GCF can be easily collected using platinum loops, filter paper strips, gingival washings and micropipettes. A number of GCF biomarkers are involved in bone remodeling during OTM. The data suggest that knowledge of the biomarkers present in the GCF may be of clinical use leading to proper choice of mechanical stress to improve and to shorten treatment time and avoid side effects.

Gingival crevicular fluid: Gingival crevicular fluid (GCF) is an exudate that can be harvested from the gingival sulcus, which offers a great potential as a source of factors associated with changes sand destruction in the underlying periodontium due to orthodontic force application. The early phase of orthodontic tooth movement involves an acute inflammatory response, characterized by periodontal vasodilation and migration of leukocytes out of periodontal ligament capillaries. The mechanism of bone resorption might also be related to the release of inflammatory mediators that can be detected in gingival crevicular fluid.

Biomechanism of orthodontic tooth movement: Two interrelated processes involved in OTM are bone bending and remodelling of the periodontal tissues, including the dental pulp, periodontal ligament, alveolar bone and gingiva. The applied force causes the compression of the alveolar bone and the PDL on one side (pressure), while on the opposite side the PDL is stretched (tension).[2] Orthodontic forces change
periodontal tissue vascularity leading to the synthesis of various signalling molecules and metabolites. The released molecules generate cellular responses around the teeth, providing a favourable microbiological environment for tissue deposition or resorption.

The pressure-tension theory proposed by Schwartz in 1932 is the simplest theory describing tooth movement on mechanical loading. On the pressure side, the biological events are as follows: disturbance of blood flow in the compressed PDL, cell death in the compressed area of the PDL (hyalinization), resorption of the hyalinized tissue by macrophages and undermining bone resorption by osteoclasts beside the hyalinized tissue, which ultimately results in tooth movement. On the tension side, blood flow is activated where the PDL is stretched, which promote osteoblastic activity and osteoid deposition, which later mineralizes. The fluid flow hypothesis, describing a mechanism by which osteocytes respond to mechanical forces, states that locally evoked strain derived from the displacement of fluid in the canaliculi is very important. When loading occurs, interstitial fluid is squeezed through the thin layer of the non-mineralized matrix surrounding the cell bodies and cell processes, resulting in local strain at the cell membrane and activation of the affected osteocytes.

The sequence of events following orthodontic tooth movement can be characterized using suitable biomarkers. Proinflammatory cytokines: Interleukin-1 (IL-1), Interleukin-6 (IL-6), Interleukin-8 (IL-8), tumornecrosisfactor-ɑ (TNF-ɑ) and prostaglandin E (PGE). The analysis of the association between alkaline phosphatase (ALP) and bone metabolism, under healthy gingival conditions, is a suggestive indicator of histological and biochemical changes in bone turnover and therefore of the amount of tooth movement. Finally, specific properties of GCF ALP activity render this enzyme an interesting diagnostic tool in orthodontics.

**Biomarkers of orthodontic tooth movement:** A biomarker is a substance that is measured and evaluated objectively as an indicator of normal biologic processes, pathogenic processes, or pharmacologic responses to a therapeutic intervention. A good biomarker should be specific and sensitive and have the ability to inform about the biological condition in terms of periodontal tissue changes and their relationships with the particular phase of OTM.

Table Showing Biomarkers of Orthodontic Tooth Movement:

<table>
<thead>
<tr>
<th>Metabolic products of para dental remodeling</th>
<th>Inflammatory mediators</th>
<th>Enzymes and enzyme inhibitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycosaminoglycans</td>
<td>Prostaglandin E</td>
<td>Cathepsin B</td>
</tr>
<tr>
<td>Pyridinium derivatives</td>
<td>Neuropeptides (Calcitonin related gene peptide and substance P)</td>
<td>Acid phosphatase and alkaline phosphatase</td>
</tr>
<tr>
<td>Pantraxin 3</td>
<td>Transforming growth factor 1</td>
<td>Glucuronidase</td>
</tr>
<tr>
<td>N-telopeptide type 1 and osteocalcin</td>
<td>Epidermal growth factor</td>
<td>Aspartate aminotransferase</td>
</tr>
<tr>
<td>Matrix metalloproteins 1 &amp; 8</td>
<td>α2 microglobulin and insulin like growth factor 1</td>
<td>Lactate dehydrogenase</td>
</tr>
<tr>
<td></td>
<td>IL1 receptor antagonist 1α,2,6,8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tumor necrosis factor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Macrophage-CSF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RANK/RANKL/osteoprotegerin system</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Myeloperoxidase</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Markers of root resorption</td>
<td></td>
</tr>
</tbody>
</table>

**Metabolic products of para dental remodeling:** Glycosaminoglycans (GAG) were investigated in the flow of GCF at three stages of orthodontic treatment viz. before orthodontic treatment, during canine retraction and in retention, to relate them to tooth movement. Studies concluded that the increase in GCF volume during OTM and the decrease during retention were only partly due to changes in the severity of gingival
inflammation (Pender et al). The pyridinium derivatives, pyridinoline (Pyr) and deoxypyridinoline (dPyr), are structural elements that bind together collagen chains. Pyr is abundant in skeletal tissues, whereas dPyr is a minor component found predominantly in bone and dentin. These two molecules are used as markers to evaluate bone resorption in such cases as Paget’s disease and primary hyperparathyroidism. Pentraxin3 (PTX3), also known as tumor necrosis factor (TNF) stimulated gene 14 (TSG14), is a 45kDa glycoprotein with a 202 amino acids Surlin et al.[12] measured the levels of PTX3 in GCF in orthodontic young and adult patients in the first 2 weeks after the orthodontic appliance showing an increased GCF levels of PTX3 suggesting PTX3 involvement in periodontal orthodontic remodeling and the aseptic inflammation induced by the orthodontic forces. N-telopeptide (NTx) is a specific marker of bone resorption because of its crosslinked a2 (I) NTx. When multiple biochemical markers of bone turnover were compared, NTx was found to be a more sensitive measure of bone resorption. Hence, NTx might be an important marker of active periodontal bone loss and could be useful for analyzing site specific responses to periodontal therapy. Osteocalcin is a noncollagenous matrix protein of calcifying and calcified tissue. It is produced by osteoblasts and has been described as the most specific marker of osteoblast function. Matrix metalloproteins (MMPs) are chemokines may contribute to differential bone remodeling in response to orthodontic forces through the establishment of distinct microenvironments in the sites of both compression and tension. MMPs are enzymes that play a central role in PDL remodeling, both in physiological and in pathological conditions.

Inflammatory Mediators: Prostaglandin E (PGE2), specially, is able to mediate inflammatory responses and induce bone resorption by activating osteoclastic cells. Prostaglandins (PGs) are a group of chemical messengers and are derivatives of arachidonic acid. It has been found that PGs have an important role in promoting bone resorption. Although the exact role of PGs in bone resorption is not clear, it is thought to do so by stimulating cells to produce cyclic adenosine monophosphate, which is an important chemical messenger for bone resorption. Research proved that the application of orthodontic force increased the synthesis of PGs, which in turn stimulated osteoclastic bone resorption. The peripheral sensory nervous system contributes to the development of acute and chronic inflammatory processes through the local release of neuropeptides. With the application of physiologic orthodontic force, SP increases production of proinflammatory cytokines and formation of osteoclasts in dental pulp fibroblasts in patients with severe orthodontic root resorption. Transforming growth factor is a family of polypeptides produced by cells within the periodontium involved in many biologic activities, including cell growth, differentiation and apoptosis, as well as in developmental processes and bone remodeling. Epidermal growth factor (EGF) is another cytokine possibly associated with bone remodeling. Fibroblasts and stromal cells produce it. Uematsuet al. in a study reported a transient elevation of EGF levels in GCF after application of mechanical stress of an experimental tooth. Alfa-2 microglobulin (α2MG) enhances the biologic action of insulinlike growth factor I (IGF). They are a family of peptides that promote cell proliferation and differentiation and have insulin like metabolic effects. They have been associated with stimulation of the osteoblasts and its functions.

Interleukin1 (IL1) are cytokines that affect bone metabolism and OTM, has 2 forms – α and α– that code different genes have similar actions. It was recently found that the concentration of leptin in GCF is decreased by orthodontic orthodontic tooth movement and this conclusively proved that leptin may have been one of the mediators responsible for orthodontic tooth movement. IL-17 has been found to be increased in patients with periodontitis, while it was barely detectable in sera from periodontally healthy individuals. Tumor necrosis factor-α, another proinflammatory cytokine, was shown to elicit acute or chronic inflammation and stimulate bone resorption. TNF-α is a pro-inflammatory cytokine that is often overexpressed in periodontitis and is responsible for alveolar bone resorption during periodontal breakdown. TNF-α plays a pivotal role in the bone resorption process, thus helping in orthodontic tooth movement. Colony stimulating factors are specific glycoproteins, which interact to regulate production, maturation and function of monocyte macrophages CSF (MCSF) as well as granulocytes CSF (GCSF). They might have implications in bone remodeling and thereby during tooth movement. An important implication in tooth movement is played by the MCSF through an increased early osteoclastic recruitment and differentiation. In the future, optimal dosages of MCSF already correlated with measurable changes in tooth movement and gene expression will provide a great potential in accelerating clinically the rate of tooth movement. The TNF related
ligand receptor activator of nuclear factor kappa ligand (RANKL) and its two receptors, receptor activator of nuclear factor kappa (RANK) and osteoprotegerin (OPG), are known for involvement in bone remodeling process. In the bone system, RANKL is expressed on osteoblast cell lineage and exerts its effect by binding the RANK receptor on osteoclast lineage cells. This binding leads to rapid differentiation of hematopoietic osteoclast precursors to mature osteoclasts. Osteoprotegerin is a decoy receptor produced by osteoblastic cells, which compete with RANK for RANKL binding. The biologic effects of OPG on bone cells include inhibition of terminal stages of osteoclast differentiation, suppression of the activation of matrix osteoclasts and induction of apoptosis. Myeloperoxidase (MPO) is an enzyme found in polymorphonuclear neutrophil (PMN) granules and can be used to estimate the number of PMN granules in the tissues. Mean MPO activity increased in both the GCF and saliva of orthodontic patients 2 h after appliance activation and they might be a good biomarker to assess inflammation in orthodontic movement.

**Enzymes and enzyme inhibitors:** Cathepsin B, an intracellular lysosomal enzyme is known to play an important role in the initiation and perpetuation of inflammatory processes. The accumulation of cathepsin B in GCF has been shown to increase with OTM. They were increased around osteoclasts and played a role in the decomposition of exposed collagen fibers and collagen degradation byproducts. Alkaline phosphatase and acid phosphatase have been examined as bone turnover markers in orthodontic tooth movement. Bone metabolism is associated with alkaline phosphatase (ALP) and acid phosphatase (ACP), expressed, respectively, by osteoblasts and osteoclasts. Alkaline phosphatase is a ubiquitous tetrameric enzyme, localized outside the cell membrane. A biomarker of primary granule release from polymorphonuclear leukocytes is the lysosomal enzyme β glucuronidase (β G). Increased levels of this enzyme have been found in the GCF of adolescents treated with the rapid maxillary expander. Moreover, β G, as other biochemical mediators like IL1β, responds to direct and indirect application of mechanical force to teeth, with an increased level that is higher than following stronger forces. Aspartate aminotransferase (AST) is a soluble enzyme that is normally confined to the cytoplasm of cells, but is released to the extra-cellular environment upon cell death. The activity levels of AST in the GCF are considered to be important in regulating alveolar bone resorption during orthodontic tooth movement. Aspartate aminotransferase (AST) and lactate dehydrogenase activities in GCF have been measured to confirm the biological activity, which occurs in the periodontium during orthodontic treatment. They are soluble enzymes normally confined to the cytoplasm of cells then released to the extracellular environment after cell necrosis. Lactate dehydrogenase, an enzyme normally limited to the cytoplasm of cells, signals an increase in LDH during orthodontic tooth movement due to changes in the periodontal ligament. Lactate dehydrogenase (LDH), an enzyme normally limited to the cytoplasm of cells, is only released extra cellularly after cell death.

**Conclusion**

The orthodontic displacement of a tooth is the result of a mechanical stimulus, generated by a force applied to the crown of a tooth, which results in an acute inflammatory response in periodontal tissues, which in turn may trigger the cascade of biological events associated with bone remodeling. Orthodontic force application could be based on individual tissue responses. The problem of relapse can be solved up to some extent by considering bone turnover rates around each experimental tooth, however a simple noninvasive method is required for achieving these possibilities. The gingival crevicular fluid alkaline phosphatase levels in can be used as a diagnostic biomarker to assess the health and pathology of the periodontium during orthodontic treatment. It can be used in early detection of changes in the periodontium and can assess the efficacy and prognosis of orthodontic treatment.

**Ethical Clearance:** Not needed

**Source of Funding:** self

**Conflict of Interest:** Nil

**References**


Policy Study and Stunting Prevention in Surabaya

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Abstract

Background: Nutritional Status Survey in 2017 showed prevalence of stunting toddlers in Indonesia was still high, which was 29.6% above the limitation determined by WHO (20%). Conducted study by Ricardo in Bhutta in 2013 stated that stunting toddler contributed against 1.5 million (15%) of toddler mortality in the world and caused 55 millions of children had lost their healthy life time every year. Result of Basic health research (Riskesdas) in 2013 stated that condition of consuming food for pregnant woman and toddlers in 2016-2017 showed in Indonesia, 1 from 5 pregnant women was malnutrition. Decrease of stunting rate only reached 4% in 1992 until 2013. Presidential Regulation number 42/2013 had determined National Movement of First Thousand Days of Life for increasing toddler’s nutritional status that was followed by development program, including its budget.

Method: This research was mix method research, which was a step in the research by combining two kinds of approaches, qualitative and quantitative. Besides, this research utilized gradual mix technique. Population in this research was Public Health Centers in Surabaya area. Meanwhile, the sample was all of policyholders in Surabaya, who were Head of Public Health Centers and midwives. This research utilized data analysis in gradual qualitative-quantitative. Not conflict of interest, source of funding self and ethical clearance taken from committee ethic. Hence, the analysis was conducted on qualitative data, then, it was followed by quantitative data.

Result and Analysis: Public Health Center of Pucang Surabaya still had the highest stunting rate among 10 Public Health Centers. Public Health Center of Tanah Kali Kedinding Surabaya had quite high increasing rate against stunting from 2017 until 2018. Almost all programs were appropriate with 1000 HPK (1000 first day of life) guidelines in area of Public Health Centers Surabaya that had been done by the midwives. According to FGD result, regulation and policies which were related to 1000 HPK, particularly for regulation of exclusive breast milk and PMBA which had been quite many either in was statute law, Government Regulation, Minister of Health Regulation, Decree of Minister of Health, or Regional Regulation. Handling stunting was done by synergy among central government, regional government, entrepreneur and community organization. High commitment from all health professions was much needed so that it could be able to hasten the decrease of stunting.

Conclusion and Suggestion: the implementation of 1000 HPK program had been conducted as an effort in reducing stunting rate. However, stunting problem still had not been solved. Therefore, it was needed cooperation mutually in cross sector for handling stunting problem, particularly in Surabaya City, East Java Province, Indonesia.

Keywords: Prevention Stunting, Policy Study, Surabaya.

Introduction

Nutritional Status Survey (PSG) 2017 showed prevalence of stunting toddlers in Indonesia was still high, which was 29.6% above the limitation determined by WHO (20%). Conducted research by Ricardo in Bhutta in 2013 stated that stunting toddlers contributed against 1.5 million (15%) of toddler mortality in the world and caused 55 millions of children had lost their healthy life time every year. Prevalence of stunting in Indonesia has quite stagnant rate from 2007 until
2013. WHO determined that limitation of nutrition problem was not more than 20%, thus, Indonesia was a country that had health problem for society. Moreover, this research aimed at studying the policy and gaps that could be solved through policy option which was through analyzing legal document and other literature and programs that had been developed. Then, it was conducted discussion form by involving experts in composing result as the policy option.

**Material and Method**

This research was mix method research, which was a step of research by combining two kinds of approaches, qualitative and quantitative. Population in this research was Public Health Centers in Surabaya. Meanwhile, the sample was all of policyholders in Surabaya area, who were Head of Public Health Center and midwives. This research utilized data analysis in gradual qualitative-quantitative. Hence, the analysis was conducted on qualitative data, then, it was followed by quantitative data.

**Findings:** Respondents in this research were midwives which the result of basic health research (Riskesdas) in 2018 showed that the decrease of stunting prevalence in National level was in 6,4% for 5 years period, from 37,2% (2013) to be 30,8% (2018). Meanwhile, for toddlers who had normal status increased from 48,6% (2013) to be 57,8% (2018). Meanwhile, the other toddlers suffered other nutrition problems.

**Description of Stunting in Surabaya:** Result of Nutritional Status Survey in 2017, stunting in Surabaya was 10,78 %, meanwhile, in 2018, it decreased to be 8,92 %. Research result for stunting data in 10 Public Health Centers in Surabaya in 2017 and 2018 as followed:

**Description of Stunting Survey based on 1000 HPK program in Public Health Center:** Surabaya is a city that implements 1000 HPK (1000 first day of life) program with good survey. In 10 Public Health Centers through midwives who had responsibility either in the inside or outside of the Public Health Center, it was obtained the result below:

<table>
<thead>
<tr>
<th>Intervention of Specific Nutrition on Pregnant Woman Group</th>
<th>Done</th>
<th>Undone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplementation of iron folate</td>
<td>78</td>
<td>12</td>
</tr>
<tr>
<td>Reducing cigarette consumption and air pollution in house</td>
<td>56</td>
<td>34</td>
</tr>
<tr>
<td>Giving additional food for pregnant woman who was chronic less energy</td>
<td>74</td>
<td>16</td>
</tr>
<tr>
<td>Overcoming pregnant woman who suffered from intestinal worm</td>
<td>68</td>
<td>22</td>
</tr>
<tr>
<td>Calcium supplementation for pregnant woman</td>
<td>78</td>
<td>12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intervention of specific nutrition on group of 0-6 months old Baby</th>
<th>Done</th>
<th>Undone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast feeding promotion (individual and group counseling)</td>
<td>74</td>
<td>16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intervention of specific nutrition on group of 7 – 23 months old Toddler</th>
<th>Done</th>
<th>Undone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast feeding promotion (individual and group counseling)</td>
<td>74</td>
<td>16</td>
</tr>
<tr>
<td>Communication of behavior changes for improving in giving complementary feeding</td>
<td>70</td>
<td>20</td>
</tr>
<tr>
<td>Zinc supplementation</td>
<td>72</td>
<td>18</td>
</tr>
<tr>
<td>Zinc for diarrhea management</td>
<td>69</td>
<td>21</td>
</tr>
<tr>
<td>Vitamin A supplementation</td>
<td>86</td>
<td>4</td>
</tr>
<tr>
<td>Giving iodine salt</td>
<td>75</td>
<td>15</td>
</tr>
<tr>
<td>Preventing acute malnutrition</td>
<td>68</td>
<td>22</td>
</tr>
<tr>
<td>Giving anthelmintic drug</td>
<td>86</td>
<td>4</td>
</tr>
<tr>
<td>Iron fortification and supplementation activity</td>
<td>80</td>
<td>10</td>
</tr>
</tbody>
</table>

**Table 1. Description of Stunting Survey based on 1000 HPK program in Public Health Center**
Almost all programs which were appropriate with 1000 HPK guideline in Public Health Centers in Surabaya had been conducted by the midwives.

**Description of Informant’s Characteristic:** Informant who participated in this research were 10 informants with varied characteristic. This research was conducted in Public Health Centers in Surabaya area and Public Health Office of Surabaya. This research was conducted in Public Health Center of Dupak, Public Health Center of Jagir, Public Health Center of Krembangan Selatan, Public Health Center of Tanah Kali Kedingding, Public Health Center of Mulyorejo, Public Health Center of Siwalan Kerto, Public Health Center of Gunung Anyar, Public Health Center of Sidotopo and Public Health Center of Sidotopo Wetan. Meanwhile, the informant was the policy maker and stunting program implementer in each agency.

**Result of Structured Interview Analysis:**

**Analysis of regional regulation system in Surabaya:** Every regulation that was conducted based on the policy, the regulation that was related to stunting was Government Regulation (PP) number 33/2012 about exclusive breast milk, Presidential Regulation number 42/2013 about national movement to accelerate nutrition improvement, planning guideline of national movement to accelerate nutrition for first thousand days of life or 1000 HPK movement had begun since 2013. Besides, it was also appropriate with planning of regional construction in chapter 260, chapter 261 and chapter 262 regarding stunting that was appropriate with planning of national construction, it was coordinated, synergized and harmonized by Regional Development Planning Agency (BAPPEDA) in Province level. It was also appropriate with 5 pillars of handling stunting, particularly in pillar 2 about national campaign and communication of behavior changes of communication strategy for behavior of stunting prevention and also there was a facility of stunting policy in regulation of minister of home affairs (permendagri) number 22/2018 about Regional Development Work Plan (RKPD) in 2019.

**Analysis of Fund Source in Stunting Prevention Program in Surabaya:** Analysis of fund source from central DIPA about technical orientation of neonatal maternal health, antenatal based on standards, SDIDTK, MTBS, SN-PKPR and Kespro catin etc., fund source from central DIPA about implementation of government matters that became regional authority which was funded by and at the expense of Regional development budget (APBD).

**Stunting Fund Allocation Policy:** Fund allocations of stunting prevention program were nutrition intervention, maternal and child health service, environment health, pregnant mother and 0-2 years old child, or household of 1.000 HPK. Effort in increasing the effectiveness from several initiative and program/activity through support from national leadership, priority decision and harmonization of this program needed coordination and technical support, high-level advocacy and cross-sectoral partnerships to accelerate target of nutrition improvement for society which was expected by focusing on nutrition improvement on first 1000 days.
of life. The policy maker and program implementer of cross sector had a power to improve the future through developing the intervention of sensitive nutrition that impacted on optimization of either individual nutrition or country. Furthermore, beginning to invest as soon as possible could result better human resource, break the poverty circle and increase economic development. However, the main goal was synergizing to break the cycle of nutrition problem for the improvement of future generation. Concerning with quite wide opportunity for effort in improving human resource against the impact of trans-generation, recently, Indonesia strengthened more the coordination from several sides.

Support for Allocation of Stunting Funds: Support for allocation of stunting funds facilitated regional government in internalizing SPM in regional development planning documents (RPJMD/RKPD), facilitated regional government in prioritizing SPM in budgeting documents (APBD), conducted a training and monitoring for implementation of government matters, facilitated the publication of Citizenship Registration Number (NIK) and newborn baby certificates.

Purpose of policy for special allocation funds (DAK) was in physique TA 2019 and as we knew that, DAK in physique was fund that was allocated in regional development budget (APBN) to certain region for donating physical certain activity which was regional matters and it was appropriate with national priority, such as providing basic public service infrastructure and facilities, both for fulfilling minimum service standard (SPM) and reaching either national priority or accelerating regional construction and region with certain characteristic for overcoming the differences in public services among regions.

Obstruction in Stunting Fund Allocation: Obstruction in stunting fund allocation was such as coordination in implementing intervention of either specific or sensitive nutrition, regulation that was related to handling stunting which had not been become as a general base for handling stunting, the access in implementing intervention of specific and sensitive nutrition still had not been integrated, it had not been optimal campaign of dissemination that was related to stunting. Besides, another obstruction was the regency/city was still late in fulfilling requirements for disbursement of funds. In addition, the requirements were making report of convergence of stunting prevention in regency level in previous fiscal year.

Regulation of Stunting Prevention Program against SPM: Regulation of stunting prevention program against SPM was managed by central policy of SPM PP number 2 in 2018 SPM, policy and regulation which were related to stunting was statute law (UU) number 36/2009 about health, UU number 18/2012 about food, RPJMN 2015-201. Moreover, it was needed synchronization of central and regional activities for regulation.

Related Policy with 1000 HPK: Related policy with 1000 HPK in Surabaya was conducted breast milk village program, companion donor “Towards Platinum City of Surabaya”, in English was “going toward the platinum generation of Surabaya” for prospective bride and groom class.

Legality Component Program: Legality component program, such as decree of work for Head of service, for Public Health Center had not been from the regency/city or from the Public Health Center itself, but there were the instruments in implementing program, such as SPM, regulation of minister of health (Permenkes) and Standard Operating Procedure (SOP) of Public Health Center, using Permenkes of 21 years in 2016 about the use of JKN Capitation Fund.

FGD Analysis: The implementation of Focus Group Discussion was conducted on Saturday, 7th September 2019 about policy study and stunting prevention in Surabaya and the respondents were 10 respondents. From the FGD analysis above, it was obtained policy study about policy of 1000 HPK which was there and it had been conducted, but the cooperation in cross society had not been occurred, synergy was between institute of central government and regional government and education institute. All of activities in society inserted with campaign for reducing stunting. After being conducted Focus Group Discussion (FGD) analysis, it was obtained policy recommendations:

- Synergy of program between Central Government and Regional Government in overcoming stunting.
- Monitoring about the implementation of 1000 HPK by society.
- Commitment of human resources for implementation in overcoming stunting in all sectors.

Discussion
Stunting was related to poverty. Concerning with
stunting toddlers was not only occurred on low/poor family, but also on middle/high family. Between poverty and stunting was like a vicious circle. 3

The poverty made nutritional adequacy in underprivileged families unfulfilled, thus, the malnourished pregnant mother would give birth the malnourished baby and stunting. Moreover, stunting toddlers who could not be intervened for first 1,000 days of life would grow up and have less productive and low quality of life. 4

Result of Nutritional Status Survey in 2017, stunting in Surabaya was 10.78 %, meanwhile in 2018, it was 8.92 %. 5 Policy of Presidential Regulation in 42/2013 about national movement to accelerate the nutritional improvement focused on rescuing first thousand days of life (1000 HPK) for stunting. In 2015, Surabaya selected to publish the policy of maternal and children safety. This research aimed at analyzing the rescue policy of 1000 HPK and decrease of stunting in Surabaya.

The success of nutrition improvement was a sequel from the success in food supply sector, behavior changes and the increase of knowledge, environment improvement and clean water facility supply, providing employment and the increase of income and also other various determinant factors. In line with it, handling nutrition problem could not only been conducted by government, but it also needed involvement and support from others, such as development partners, non-governmental organization, universities, professional organization and community organization. Hence, let’s cooperate to improve nutrition condition for Indonesian toddlers. We are in Ministry of People’s Welfare will do coordination to all activities which are done either by government or non-government in improving nutrition for society.

From quantitative data, it was seen that first sequence for stunting problem was seen in Public Health Center of Pucang (20.27 %) and this rate had been below national target, that was 28 %, which meant that it had been success to reduce stunting rate from cumulative percentage. However, if it was seen from the increase in previous year, it was known that in the average, it did not increase significantly. This was because most of Public Health Centers here had conducted the activity of 1000 HPK program.

More over, stunting was correlated with poverty. Nevertheless, case of stunting toddlers was not only occurred on low/poor family but also on middle/high family. In other word, it was like a vicious circle between poverty and stunting. The poverty made nutritional adequacy in underprivileged families unfulfilled, thus, the malnourished pregnant mother would give birth the malnourished baby and stunting. Moreover, stunting toddlers who could not be intervened for first 1,000 days of life would grow up and have less productive and low quality of life.

**Conclusion and Suggestion**

The implementation of 1000 HPK program had been conducted as an effort in reducing stunting rate. However, stunting problem still had not been solved. Therefore, it was needed cooperation mutually in cross sector for handling stunting problem, particularly in Surabaya City, East Java Province, Indonesia.

**Ethical Clearence:** Taken from Health Polytechnic Health Ministry Surabaya committee.

**Source of Funding:** Self

**Conflict of Interest:** Nil.

**References**


Estimation of Skin Radiation Dose from Common Radiographic Examinations: A Preliminary Study to Establish Diagnostic Reference Levels (DRLs)

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Abstract

The aim of this study was to estimate the skin radiation dose received by adults’ patients undergoing most common eight X-ray examinations. The study was conducted in three hospitals in three different Iraqi cities: Najaf, Babylon and Salah AL-Din. A minimum number of 10 patients were considered for each type of X-ray examination in each hospital. The skin radiation dose calculation was performed by mathematical equation using exposure factors, namely, X-ray tube voltage (kVp), tube loading (mAs) and source-skin distance (SSD). The skin radiation dose values were obtained for all patients involved in this study who undergoing skull (AP and Lat), cervical (Lat), chest (PA), abdomen (AP), lumbar (Lat), pelvis (AP) and knee (AP) examinations. The resulted data were analyzed and compared with international reference doses. The average skin radiation dose ± standard deviation (SD) for the three hospitals were 0.77±0.43mGy for skull (AP), 0.66±0.39mGy for skull (Lat), 0.63±0.34mGy for cervical (Lat), 0.28±0.25mGy for chest (PA), 4.36±2.92 mGy for abdomen (AP), 4.37±2.30mGy for lumbar (Lat), 1.65±1.09mGy for pelvis (AP) and 0.40±0.25 mGy for knee (AP) examinations. For majority of the considered radiographic examinations Balad general hospital recorded the highest skin radiation dose. Overall most of the recorded radiation doses were within the internationally acceptable dose levels with some variations amongst different hospitals.

Keywords: Dosimetry, mathematical calculation, general radiography, patient dose.

Introduction

Ionizing radiation (IR) is used in medicine in two main areas, diagnostic and therapeutic. In diagnosis, IR enable the explore of anatomical human body structures and determine their physiological abnormalities. The diagnostic imaging modalities include conventional X-ray procedures, fluoroscopic and computed tomography examinations. Nuclear medicine, which mainly use gamma rays, is another diagnostic procedure use IR. Diagnostic radiology and nuclear medicine have been reported as the largest radiation source of man-made exposures. Since 1980, the radiation exposure from medical procedures has increased by 600% in the US. This increment makes the medical imaging contribute up to 88% of artificial radiation sources to population in the US. Similarly, the medical imaging constitutes 96% of man-made radiation sources to the UK population. The global increase in medical radiation exposure is attributed to the tremendous increase in the number of radiographic examinations in many countries, particularly developing countries where radiographic examinations frequency is doubled or even tripled. The substantial increase in the frequency of CT examinations, which characterized by high radiation dose when compared to conventional
X-ray examinations, within the last few decades is another cause medical radiation exposure increment. Despite of this increase in medical radiation exposure, patients radiation dose from radiographic examinations are considered acceptable when compared to large benefits of these diagnostic procedures. Accordingly, any diagnostic procedure involve IR should be justified.

The concept of justification was recommended by the ICRP in their publication 103. According to justification principle, radiographers should not apply the IR to the patient unless the benefits of examination outweigh harms of radiation. The justification become an essential part of health professional duty in diagnostic radiography and nuclear medicine departments. Therefore, the quantification of radiation risk to patient from radiographic examination becomes very important.

From radiation protection view there is a main concern regarding justification. This concern is due to the variations of radiation dose to similar size patients subjected to same radiographic procedure by different facilities. This was firstly reported by the ICRP who documented that the dose variation factor ranged between 2 and 10. Accordingly, the ICRP introduced the concept of DRL within their publication 73 and developed it in their subsequent publications. DRL is a tool used in radiation protecting to optimize the radiation dose to patient from interventional and diagnostic procedures. In diagnostic imaging procedures involving IR, DRL is used to estimate whether the radiation dose from a specific procedure is extremely large or extremely small. For protection optimization purpose, DRL is insufficient and image quality should also be considered. Any radiological examination achieved with radiation dose less than DRL does not mean that the examination is optimized. Accordingly, the ICRP recommended the use of DRLs rather than the use of dose limits.

DRL is established for specific procedure using standard size, weigh 50-90kg, patients data. Phantoms are not recommended for the establishment of DRL. DRLs can be set locally for specific area of a country, nationally or regionally. In general DRL should be established for a reasonable number of facilities at least 10 machines with at least 20 patients for each procedure and the third quartile is the DRL. For local areas with 1-10 facilities median can be used as DRL value. The ICRP recommended the regular revision of DRL values every 3-5years. Accordingly, the assessment of radiation dose from radiographic procedures becomes of great interest by many researchers.

In Iraq there is no published DRLs yet and even there is limited number of published studies that consider the patient radiation dose from radiographic examinations. The aim of this study is to estimate the skin radiation dose from most common interventional X-ray examinations in three Iraqi Province as a preliminary step to establish local DRLs in each province which may be then developed to set national DRLs in Iraq.

**Material and Method**

This is a prospective study includes data for average size 240 adult patients collected from the main hospitals in three Iraqi provinces; Al-Sadder teaching (ST) hospital in Najaf, Al-Hillah teaching (HT) hospital in Babylon and Balad general (BG) hospital in Salah AL-Din. The radiographic examinations frequency data during the last 6 months in these hospitals was used to determine the most common eight examinations. These examinations include: skull (AP) and (Lat), cervical spine (Lat), chest(PA), abdomen(AP), lumbar spine (Lat), pelvis (AP) and knee joint (AP). Then for each radiographic examination, 10 patients data was collected from each hospital. For each patient the collected data include the X-ray tube potential (kVp), the product of X-ray tube current and exposure time (mAs) and the skin-source distance (SSD). Then these parameters were used for the assessment of skin radiation dose using the following equation:

\[
\text{Skin does (µGy)} = 418\text{(kVp)}^{1.74} \times \text{mAs/(SSD)}^2 \times (1/T+0.114)
\]

Where (T) is the total filtration of the X-ray beam which is constant (2.5mmAl) in this study because all the considered machines were from same manufacturer; SHIMADZU. The above equation was formulated into a simple programme using matlab to facilitate the process of mathematical calculations of patients skin radiation dose.

Since the patient identifying detail were not collected, the approval of the study protocol by the
local Ethics Committee in each hospital waived the requirement for obtaining informed consent.

**Results**

Tables (1-3) show exposure data along with calculated skin radiation dose for the considered radiographic examinations in terms of mean±standard deviation(SD).

The analyses on measurements throughout the three hospitals were performed demonstrating that the radiation doses presented in BG hospital (Table 1) tend to be the highest for most considered examinations when compared to the doses in the other two hospitals included in the study. The second highest radiation doses were reported at HT hospital (Table 2). However, the lowest radiation doses were recorded at ST hospital (Table 3). These variations in calculated radiation dose can be attributed to the relatively higher X-ray tube parameters used in BG hospital in addition to the smaller SSD. For all the included hospitals the radiation doses from abdomen (AP) and lumbar (Lat.) were the highest while the lowest recorded dose was from chest (PA) X-ray in HT and ST hospitals. The lowest radiation dose recorded at BG hospital was from skull lateral examination (Figure 1).

Figure (2) demonstrates the preliminary data of established DRLs for the eight considered radiographic examinations in the three hospitals. These data include the minimum, first quartile, median, third quartile and maximum skin radiation dose for each examination. According to the ICRP, the medians can be considered as DRLs due to the small sample size.

### Table (1): Exposure factors along with calculated skin radiation dose for the eight considered examinations in BG hospital.

<table>
<thead>
<tr>
<th>Examination</th>
<th>kVp Mean±SD</th>
<th>mAs Mean±SD</th>
<th>SSD (cm) Mean±SD</th>
<th>Dose (mGy) Mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skull (AP)</td>
<td>66.10±1.73</td>
<td>4.65±0.36</td>
<td>90.00±14.53</td>
<td>0.194±0.06</td>
</tr>
<tr>
<td>Skull (Lat.)</td>
<td>62.40±2.27</td>
<td>4.26±0.16</td>
<td>103.50±19.01</td>
<td>0.126±0.05</td>
</tr>
<tr>
<td>Cervical (Lat.)</td>
<td>70.30±3.80</td>
<td>20.70±3.33</td>
<td>90.50±15.36</td>
<td>0.938±0.30</td>
</tr>
<tr>
<td>Chest (PA)</td>
<td>74.80±1.55</td>
<td>23.20±2.86</td>
<td>121.90±4.36</td>
<td>0.616±0.11</td>
</tr>
<tr>
<td>Abdomen (AP)</td>
<td>83.60±2.76</td>
<td>51.60±2.07</td>
<td>55.30±3.80</td>
<td>8.112±1.17</td>
</tr>
<tr>
<td>Lumbar (Lat.)</td>
<td>83.30±2.11</td>
<td>58.00±6.99</td>
<td>62.50±8.36</td>
<td>7.200±1.45</td>
</tr>
<tr>
<td>Pelvis (AP)</td>
<td>69.80±3.46</td>
<td>6.89±0.53</td>
<td>95.60±19.84</td>
<td>0.290±0.10</td>
</tr>
<tr>
<td>Knee (AP)</td>
<td>63.10±6.72</td>
<td>11.30±5.25</td>
<td>72.00±11.11</td>
<td>0.635±0.30</td>
</tr>
</tbody>
</table>

### Table (2): Exposure factors along with calculated skin radiation dose for the eight considered examinations in HT hospital.

<table>
<thead>
<tr>
<th>Examination</th>
<th>kVp Mean±SD</th>
<th>mAs Mean±SD</th>
<th>SSD (cm) Mean±SD</th>
<th>Dose (mGy) Mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skull (AP)</td>
<td>84.00±2.11</td>
<td>15.20±0.92</td>
<td>79.70±1.57</td>
<td>1.147±0.09</td>
</tr>
<tr>
<td>Skull (Lat.)</td>
<td>80.00±3.33</td>
<td>15.20±0.92</td>
<td>85.00±0.00</td>
<td>0.928±0.10</td>
</tr>
<tr>
<td>Cervical (Lat.)</td>
<td>84.60±2.37</td>
<td>12.30±1.16</td>
<td>136.50±1.08</td>
<td>0.320±0.03</td>
</tr>
<tr>
<td>Chest (PA)</td>
<td>98.50±2.12</td>
<td>5.00±0.47</td>
<td>149.20±7.25</td>
<td>0.143±0.02</td>
</tr>
<tr>
<td>Abdomen (AP)</td>
<td>107.00±2.58</td>
<td>44.50±4.38</td>
<td>96.60±0.97</td>
<td>3.490±0.45</td>
</tr>
<tr>
<td>Lumbar (Lat.)</td>
<td>95.50±2.92</td>
<td>36.10±3.28</td>
<td>76.80±0.92</td>
<td>3.664±0.35</td>
</tr>
<tr>
<td>Pelvis (AP)</td>
<td>86.50±2.42</td>
<td>35.40±3.41</td>
<td>79.90±1.52</td>
<td>2.798±0.30</td>
</tr>
<tr>
<td>Knee (AP)</td>
<td>54.50±3.69</td>
<td>6.90±1.20</td>
<td>88.70±1.25</td>
<td>0.199±0.04</td>
</tr>
</tbody>
</table>
Table (3): Exposure factors along with calculated skin radiation dose for the eight considered examinations in ST hospital.

<table>
<thead>
<tr>
<th>Examination</th>
<th>kVp Mean (SD)</th>
<th>mAs Mean (SD)</th>
<th>SSD (cm) Mean (SD)</th>
<th>Dose (mGy) Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skull (AP)</td>
<td>80.00±4.08</td>
<td>14.40±1.58</td>
<td>80.70±1.16</td>
<td>0.973±0.12</td>
</tr>
<tr>
<td>Skull (Lat.)</td>
<td>81.00±3.94</td>
<td>14.80±1.40</td>
<td>84.70±1.25</td>
<td>0.928±0.11</td>
</tr>
<tr>
<td>Cervical (Lat.)</td>
<td>73.70±3.43</td>
<td>14.80±2.78</td>
<td>96.20±8.30</td>
<td>0.644±0.25</td>
</tr>
<tr>
<td>Chest (PA)</td>
<td>93.60±8.81</td>
<td>2.30±0.48</td>
<td>133.20±5.27</td>
<td>0.076±0.02</td>
</tr>
<tr>
<td>Abdomen (AP)</td>
<td>83.60±2.32</td>
<td>22.20±1.99</td>
<td>85.90±8.67</td>
<td>1.473±0.34</td>
</tr>
<tr>
<td>Lumbar (Lat.)</td>
<td>98.50±9.73</td>
<td>22.20±2.20</td>
<td>79.80±1.62</td>
<td>2.250±0.63</td>
</tr>
<tr>
<td>Pelvis (AP)</td>
<td>88.50±7.84</td>
<td>22.10±2.38</td>
<td>79.30±1.95</td>
<td>1.857±0.37</td>
</tr>
<tr>
<td>Knee (AP)</td>
<td>68.00±6.32</td>
<td>10.90±0.99</td>
<td>99.30±8.18</td>
<td>0.379±0.11</td>
</tr>
</tbody>
</table>

Figure (1): Radiation dose comparison amongst the three hospitals for the eight considered examinations.
Discussion

The comparison of skin radiation dose amongst the three hospitals demonstrated that the skin radiation doses from most radiographic examinations were different. In spite of these differences, all the calculated skin doses were within the acceptable dose levels recommended by the European Commission (EC).\(^{(16)}\)

For skull (AP) examination the highest radiation dose recorded in HT hospital (1.147±0.09mGy), while the lowest dose was from BG hospital (0.194±0.06mGy). This can be explained by the low exposure factors used in BG hospital for this examination (Table 1) in addition to the small SSD used in HT hospital (Table 2). The preliminary DRL data for this examination in the three hospital was 0.982mGy median and 1.093mGy third quartile. These radiation dose data for skull AP examination is consistent with previous studies wherein the maximum acceptable skin dose is 5mGy.\(^{(16,17)}\)

As reported by the EC\(^{(16)}\), the calculated skin radiation dose from skull lat. X-ray in this study is lower than that from skull AP in the all considered hospitals. The lowest dose was 0.126±0.05mGy in BG hospital (Table 1). Equal mean radiation dose was recorded in both HT and ST hospitals (0.928mGy) but with different SD in each hospital (Tables 2 and 3). These recorded radiation doses in the three hospitals were within the acceptable dose for this examination, which is ≤3mGy. For the three hospitals the median and third quartile of the skin radiation dose were 0.853mGy and 0.975mGy, respectively (Figure2).

Regarding Lat. X-ray of the cervical spine, the highest dose was recorded at BG hospital (0.938±0.30mGy), while the lowest dose was recorded at HT hospital (0.320±0.03mGy) (Figure 1). This difference in calculated skin dose between the hospitals may be attributed to the different exposure factors as
well as the different SSD used in the hospitals (Tables 1 and 2). In comparison to previously published work, the radiation dose from C-spine lat. X-ray in this study, which was 0.63mGy, tends to be comparable. For instance, Kim, Choi(14) reported that the skin dose from this examination is 0.48mGy. The overall median and third quartile at the three hospitals is 0.56 and 0.84mGy, respectively (Figure 2).

Since chest X-ray is the most frequent radiographic examination, a large number of studies considered the radiation dose from this radiographic examination.(1,2,18) The majority of these studies concluded that the chest X-ray radiation dose in many countries was within the acceptable dose limit published by EC(16); 0.3mGy. In this study the average dose from chest X-ray was 0.28mGy with some differences amongst the considered hospitals. BG hospital recorded the highest radiation dose (0.616±0.11mGy) which was higher than the acceptable range and this may be due to the short SSD used in this hospital. However, the other two hospitals showed lower radiation dose than the recommended level, 0.143±0.02 and 0.076±0.02mGy and this may be attributed to the use of post-processing manipulation of the image in these hospitals. Similarly large differences amongst hospitals has been reported in Iran by Paydar, Takavar(18); 0.53mGy at one hospital and 0.095mGy at the other. Regarding the DRL data the recorded median and third quartile of radiation dose, from chest X-ray, were 0.140mGy and 0.544mGy. The radiation dose median is within the acceptable international limits while the third quartile is higher than those limits. This is particularly due to the extremely high radiation dose recorded at BG hospital. Accordingly BG hospital needs to consider the radiation from chest X-ray achieved in its radiography department.

Similar to chest X-ray, the highest radiation dose from abdominal X-ray was at BG hospital. The doses at the three hospitals were 8.112±1.17, 3.490±0.45 and 1.473±0.34mGy, respectively. All this dose data are within the internationally accepted dose level for this examination, which is 10mGy, but higher than that recorded in Korea by Kim, Choi.(14)

Regarding the radiation dose from Lat. lumbar examination, the radiation dose recorded at the three hospitals (Tables 1-3) are consistent with the internationally recommended dose levels(16) as well as the previously published work by Kim, Choi.(14)

The lowest dose from pelvis AP X-ray radiation was recorded at BG hospital; 0.290±0.10mGy. This dose look very small when compared to EC data.(16) This may be attributed to the use of post-processing of the image and may be the patients’ size attended this hospital less than the standard body size. However, at the two other hospitals the dose data, 2.798±0.30 and 1.857±0.37mGy, is consistent with that published by Kim, Choi.(14); 2.44±1.06mGy.

Finally, the radiation dose from AP knee X-ray examination at the three considered hospitals is consistent with that published by Kim, Choi(14) with highest dose was recorded at BG hospital.

**Conclusion**

For the three considered hospitals, the average estimated skin radiation dose from most radiographic examinations tend to be within the internationally acceptable limits. However, the ESD data for each hospital separately demonstrated that for some examinations the radiation dose were higher than acceptable limit and this mainly due to the wide dynamic range of digital radiography.

**Ethical Clearance:** The study protocol is approved by the local ethics committee in each hospital.

**Source of Funding:** Self-funding.

**Conflict of Interest:** Nil.

**References**


Sex Determination from Lower End of Humerus Using Morphological Traits in Indian Population

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†Assistant Professor, Department of Forensic medicine & toxicology, VMCH Madurai

Abstract

One of the main objectives in forensic examination is identification. In case of skeletal remains examination, sex determination is one of the important parameters for identification. Here in this study, lower end of humerus is studied for sex determination by morphological method. As there is a difference in carrying angle between male and female, there should also be observable difference existing in lower end of humerus. Hence four morphological characteristic features of distal humerus including shape of olecranon fossa, angle of medial epicondyle, trochlear symmetry and trochlear constriction were assessed for sexual dimorphism and their accuracy in sex determination. When each of these features considered individually, the result was shape of olecranon fossa showed more accuracy (m:87%, f:69%) in sex determination and if any three of these features considered collectively accuracy in sex determination was (m:61%, f:72%).

Keywords: Sex determination, lower end of humerus, distal humerus, morphological traits.

Introduction

Identification is an important parameter in forensic examination of the dead and in case of skeletal remains, primary parameters of identification includes age, sex, stature and race.† Determination of age, stature, as well as race to an extent depends on the sex of the deceased. Sex determination is a simple task in fresh bodies, but in case of severely decomposed, commingled, dismembered or skeletonized bodies, sex determination is a challenging task.‡

In this study, an attempt is made to determine sex from the Humerus bone as it is one of the long bones possibly recovered in most of the forensic cases either complete or in a fragmented state. There are two methodological approaches for Sex determination from bones, morphological method and the metric method. Morphological method uses the physical visual differences expressed between males and females known as sexual dimorphism. Metric method uses differences in measurements of the traits between the sexes.§ Pelvis and skull show more accuracy in sex differentiation by morphology method than any other bones.¶ Commonly used method for sex determination in long bones is by metric method. The metric method for determining sex in humerus have been studied frequently and also yielded more accuracy results.‖ Morphology method of assessments are studied, but to a lesser extent. In this study, the lower end of humerus is chosen for sex determination as it in articulated state with ulna and radius show sexual dimorphism in carrying angle. The lateral deviation of the human forearm from the axis of the upper arm is more in females than in males (10–15 degrees in males, 20–25 degrees in females).‖ The differences in carrying angles between male and female imply that there may be also differences in morphology of distal end of humerus. Here in this study, morphological characteristics of distal end of humerus of south Indian population is assessed for any differences exist between male and female and whether can be used for sex determination.

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Materials and Method

The samples for study included dry human humerus bones collected from dept of forensic medicine and anatomy of a medical college hospital in Madurai South India. Total number of bones collected for the study included 100 bones out of which 71 were male bones and 29 were of female bones. Bones from both the sides were included in the study.

Inclusion criteria:

Only matured skeletal bones were considered

Only specimens that were healthy were chosen

Exclusion criteria: Specimens exhibiting pathology, trauma, or any type of post-mortem damage were excluded

Bones showing advanced degenerative conditions were excluded

Distal end of humerus were studied for any visual morphological variation exist in male and female bones

- Morphological features considered were
- Olecranon fossa for its variation in shape
- Medial epicondyle for its angulation
- Trochlea for its shape and symmetry
- Trochlea for its constriction

These morphological features were outlined by Rogers.11

Each morphological feature is assessed for its sexual dimorphism and if any distinct feature is observed, they are grouped either into male or female

If does not show distinct feature grouped into indeterminate or ambiguous

Thus Bones are categorised into distinctly male, distinctly female and indeterminate or ambiguous

Their percentage of accuracy is calculated for sex determination from each of these morphological feature or as collectively from these morphological features.

A second observer was utilised to visually asses the morphological features independently to rule out intra observer error

Observation: Considering olecranon fossa, the shape ranged from triangular (where upper half of olecranon fossa forming an apex either pointed or rounded) to oval (where upper half of fossa is curved arc like). Triangular shape was more common in male and oval shape was more common in female (fig.1)

Considering the angle of Medial epicondyle, posterior edge of medial epicondyle either remains flat (i.e., remains parallel with other features of distal humerus when placed posterior surface facing upwards on a table) or it may show raised angulation. Most of the female bones did show a raised angulation whereas most of male bones medial epicondyle was flat and did not show angulation (fig.2)

Trochlear symmetry- trochlea consist of medial and lateral rim with constriction inbetween these two. If the medial rim of trochlea extends markedly downwards, it is considered asymmetrical or if extension of medial rim is slightly inferior to level of capitulum it is considered symmetrical trochlea.

Asymmetrical trochlea is common in male and trochlear symmetry is more common in female (fig.3).

Trochlear constriction: The inferior border between two rims of trochlea may show a smooth curvature or a marked midline constriction. Smooth curvature is common in male bones and marked constriction is commonly seen in female bones. (fig.3)

Statistical analysis: To establish the accuracy in sex determination from these morphological features of distal humerus statistical analysis was conducted using chi square test from the observations made from the bones. Intra observer error was also assessed using chi square test.

Results

Four indicators for sex determination from lower end of humerus were considered

Shape of olecranon fossa: Out of 100 bones 69 were triangular in shape 21 were oval in shape 10 were not able to categorise into either of the two. Out of 100 humerus 71 were male bones. Out of which 62(87.32%) showed triangular shape 1 (1.4%) show oval shape and 8(11.26%) were not able to categorise into either of the two. Out of 29 female bones 20 (68.9%) showed oval shape 7 (24.13%) showed triangular and 2 (6.9%) were not able to categorise. The chi square value was 57.0557 which was statistically significant with p value <0.05.
Angle of medial epicondyle: Out of 100 bones, in 34 bones markedly raised angulation were made out, in 56 no anulation were made out and in 10 bones it was indeterminate (which neither did show marked angulation nor flat). Out of 71 male bones 50 (70.42%) showed no angulation and 13 (18.3%) showed markedly raised angulation and 8 (11.26 %) were indeterminate. Out of 29 female bones 21 (72.41%) showed no angulation and 6 (20.69%) showed markedly raised angulation and 2 (6.9%) were indeterminate. The chi square value was 27.2144 which was statistically significant with p value <0.05

Trochlear symmetry: Out of total 100 bones 25 bones showed trochlear symmetry 54 showed asymmetry and 21 were ambiguous. Out of 71 male bones 49(69.01%) showed asymmetry trochlea 8(11.26%) showed trochlear symmetry and 14 (19.7%) were ambiguous. Out of 29 female bones 5 (17.24%) showed asymmetry trochlea 17(58.62%) showed trochlear symmetry and 7(24.13%) were ambiguous. The chi square value was 28.8795 which was statistically significant with p value <0.05

When these morphological features are considered collectively for sex determination. The male bones satisfying all four features of male characteristics were 29 in number (41%). The female bones satisfying all four features of female characteristics were 16 in number (55%). But if any three of the features together is considered, in male bones out of 71 bones 44 (61%) were accurately identified as male and in female bones out of 29 bones 21 (72%) were accurately identified as female.

Table 1

<table>
<thead>
<tr>
<th>Morphological traits</th>
<th>Male (Total 71 bones)</th>
<th>Female (Total 29 bones)</th>
<th>Chi square value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olecranon fossa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oval</td>
<td>1 (1.40%)</td>
<td>20 (68.9%)</td>
<td></td>
</tr>
<tr>
<td>Ambiguous</td>
<td>8 (11.26%)</td>
<td>2 (6.9%)</td>
<td>57.0557</td>
</tr>
<tr>
<td>Triangular</td>
<td>62 (87.32%)</td>
<td>7 (24.13%)</td>
<td></td>
</tr>
<tr>
<td>Medial epicondyle angle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raised angle</td>
<td>13 (18.3%)</td>
<td>21 (72.41%)</td>
<td></td>
</tr>
<tr>
<td>Intermediate</td>
<td>8 (11.26%)</td>
<td>2 (6.9%)</td>
<td>27.2144</td>
</tr>
<tr>
<td>Flat</td>
<td>50 (70.42%)</td>
<td>6 (20.69%)</td>
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<tr>
<td>Trochlear symmetry</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Symmetrical</td>
<td>8 (11.26%)</td>
<td>17 (58.62%)</td>
<td></td>
</tr>
<tr>
<td>Ambiguous</td>
<td>14 (19.7%)</td>
<td>7 (24.13%)</td>
<td>28.8795</td>
</tr>
<tr>
<td>Asymmetry</td>
<td>49 (69.01%)</td>
<td>5 (17.24%)</td>
<td>p value &lt; 0.05</td>
</tr>
<tr>
<td>Trochlear constriction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constriction present</td>
<td>20 (28.16%)</td>
<td>23 (79.31%)</td>
<td></td>
</tr>
<tr>
<td>Ambiguous</td>
<td>8 (11.26%)</td>
<td>3 (10.34%)</td>
<td>23.8279</td>
</tr>
<tr>
<td>No constriction</td>
<td>43 (60.56%)</td>
<td>3 (10.34%)</td>
<td>p value &lt; 0.05</td>
</tr>
</tbody>
</table>

Table 2: Accuracy of sex determination using morphological features from lower end of Humerus

<table>
<thead>
<tr>
<th>Features</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olecranon fossa</td>
<td>87.32%</td>
<td>69%</td>
</tr>
<tr>
<td>Medial epicondyle angle</td>
<td>70.42%</td>
<td>72.41%</td>
</tr>
<tr>
<td>Trochlear symmetry</td>
<td>69.01%</td>
<td>58.62%</td>
</tr>
<tr>
<td>Features</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>Trochlear constriction</td>
<td>60.56%</td>
<td>79.31%</td>
</tr>
<tr>
<td>All 4 features collectively taken</td>
<td>41%</td>
<td>55%</td>
</tr>
<tr>
<td>Any 3 features combined</td>
<td>61%</td>
<td>72%</td>
</tr>
</tbody>
</table>

**Fig. 1:** Left Humerus bone is female with oval olecranon fossa and right is male with triangular shape

**Fig. 2:** Female humerus on left with raised medial epicondyle angle and on right male humerus with no angulation

**Fig. 3:** Left side 2 bones with trochlear asymmetry and without constriction, right side 2 bones with trochlear symmetry and constriction
Discussion

In this study sex determination from lower end of humerus was done using morphological method by assessing various characteristic features of lower end of humerus like shape of olecranon fossa, angulation of medial epicondyle, trochlear symmetry and constriction. As there is variation in carrying angle in male and female there should also be variation in anatomical features at the lower end of humerus. Hence variation in these morphological features were assessed for sexual dimorphism and also their accuracy in sex determination. When each of these morphological features were considered individually, on assessment of olecranon fossa shape, out of 71 male bones 62 showed triangular shape with 87.32% accuracy and in female bones out of 29 bones 20 showed oval shape with 68.9% accuracy. In medial epicondyle 50 out of 71 male bones showed no angulation with 70.42% accuracy and 21 out of 29 bones show marked raised angulation with 72.41% accuracy. Considering trochlear symmetry 49 out of 71 male bones showed asymmetry with 69% accuracy and 17 out of 29 female bones showed symmetry with 58.62% accuracy. Considering trochlear constriction 43 out of 71 bones showed no marked constriction with 60.56% accuracy and 23 out of 29 female bones showed marked constriction with 79.31% accuracy. All were statistically significant with p value <0.05. When all these morphological features considered collectively in combination for sex determination accuracy was only 41% in male bones and 55% in female bones. When any three of these morphological features were considered for sex determination accuracy was 61% for male bones and 72% for female bones. The results obtained demonstrate that the morphological features of the lower end of humerus can be used for sex determination. Considered individually olecranon fossa shape was more accurate in sex determination followed by medial epicondyle, trochlear symmetry and trochlear constriction was less accurate compared to others at least in male bones. But when all four features combined are taken into consideration for sex determination it becomes less accurate as in only 41% of male bones showed all male characteristics, this may be due to bones satisfying all male features or all female features were less, as in many male bones trochlear constriction was unreliable. But any three of the features are taken into consideration for sex determination it was 61% for males and 72% for female bones which are statistically significant and reliable for sex determination. In study conducted by Vance et al.,12 on south African population, when three morphological variants including olecranon fossa, medial epicondyle angle, trochlear symmetry and were used in conjunction all males were classified with a 74% accuracy rate, while all females were classified accurately 77% which is quite par with present study. Also their study showed the angle of the medial epicondyle was seen as the most accurate feature followed by olecranon fossa, but in present study it was olecranon fossa more accurate. In study conducted by Falys et al.,13 on the documented skeletal assemblage of St. Bride’s, London, showed when morphological variants considered individually

Fig. 4A, B, C: Different variations of capitulum and trochlea complex observed in this study.
olecranon fossa was more accurate with 86.4% for male and 76.6% for female bones followed by angle of medial epicondyle 72.3% for male and 77.8% for female. Again which is quite par with present study. When considered collectively all features combined showed 72.4% in male and 80.4% in female. This was quite par when any three features taken in combination for assessing sex. But Rogers\textsuperscript{11} study found 100% accuracy for females and 85.7% accuracy for males (average 88.6%) when using a combination of characteristics where present study is largely deviant from it.

There was also an other observation made in this study which include the shape of capitulum and trochlea complex, where in male bones they appeared in few different variations, like capitulum a large body gradually tapers and merge with trochlea where no distinction can be made out between capitulum and lateral rim of trochlea followed by marked constriction and medial rim of trochlea (fig. 4A), other variation include capitulum is large but can be distinguished separately from lateral rim of trochlea by a smooth slight ridge formation of lateral rim of trochlea followed by smooth arched constriction from medial rim of trochlea (fig. 4B). In female bones this capitulum and trochlea complex where a clear distinction can be made out between capitulum and trochlea by a prominent, sharper lateral trochlear rim followed by a sharp constriction and then medial rim (fig. 4C).

**Conclusion**

Sex determination using morphological variants have been done by different authors on different population but these are mainly done on western population mostly of European and African population. As there are no any data or study on Indian population, this study was conducted and the results obtained indicate that, this morphological method of assessment of various features from lower end of humerus were statistically significant and can be used in sex determination of humerus bones.

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**Source of Funding:** Self

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A Revolution in Health Care Sector Through Data Sciences

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Abstract

Healthcare industry is undergoing a digital transformation. There is lot of work which is happening that leverages the newer technologies in the healthcare industry. Technological advancements will be driver for change for future ready health care industry. Health care industry, now understands the role of digital technology platforms and has started embracing it to be future ready.

Digital transformation in health care industry shall be another milestone in patient care and hospital management. Changing mind-set of care givers and customers will be a challenge for all players to think differently. Emergence of disruptive technology in health care industry has potential scope to provide error free services worldwide. This is a qualitative study in which challenges and opportunities of Technology in Health Care Industry will cover.

Keywords: Health Care industry, digital transform, artificial intelligence and disruptive technology.

Introduction

Healthcare industry is undergoing a silent transformation using the newer technologies such as AI, deep learning, big data etc. The work which has been done so far has been very encouraging and is all set to change the paradigm of the healthcare industry. Today’s patients are understanding the importance of health care and they are budgeting for the same. For future persecutions such expenses shall be increase accordingly¹.

The old rules will be rewritten and the complexion of the industry will change completely with newer players entering and dominating the field. Healthcare industry and its various components such as pharmaceuticals, hospitals and medical devices etc.All are set to undergo major transformation in their business models. Emergence of the new technology platform like Artificial intelligence, big data are used by many industries and initial trends are helping them to define their pros and cons. Another aspect of health care is to provide a safest service to their customer’s transparency and disclosure with the help of technology is playing crucial role².

Use of these emerging technologies to run business is not new and many industries have had initial success. For instance, ecommerce industry uses AI extensively to do predictive analytics and based on users’ search pattern and past history, suggests various options for buyers to consider. Similarly, many other industries are using AI and machine learning³ to improve their productivity.

Technology in healthcare—will incumbents rule the new world or will there be new companies:

With respect to the healthcare industry, there are many applications which are under development. Healthcare industry can greatly benefit for newer technologies as it will make the healthcare delivery more affordable, accessible and reduce medication errors. Even Artificial intelligence will help medical fraternity⁴ in getting second opinion(Dr Amit Kumar Pandey, 2018).

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in this study, researchers will reveal various aspects of medical treatment pattern on the basis of big data and artificial intelligence.

All the major pharmaceutical companies are leveraging this and have established separate departments to uncover the potential. Novartis, Pfizer and several other major pharma companies are working on big data and artificial intelligence and have demonstrated that these new technologies are helpful. Digital therapeutics is another area of scope where software based solutions treat and support different kinds of diseases. Digital health care delivery system is the next frontier of curing chronic patients. It has been defined⁸ that (Sophie Park MPH., 2019) within the pharmaceutical industry there are many areas which are undergoing fundamental transformation. Drug discovery is being transformed with the use of new age technology. Bioinformatics, clinical trials are some of the key areas where maximum impact is being felt. Clinical trials have started using AI based apps and other features for cohort selection (patient selection) and patient monitoring. Big data is helping in identifying newer patterns in clinical trials and making it more predictive of the real world outcome.

Technology companies such as Google and Microsoft are providing platforms for various healthcare companies, so that they can build applications and improve healthcare outcomes. Microsoft is partnering with lot of companies in the healthcare segment and helping them improve their business processes and services. On one hand they are helping research based companies to understand disease patterns and make discovery more predictive while on the other hand, they also partnering with distribution and pharmacies to improve their supply chain and improve last mile connectivity for medicine delivery.

Microsoft has many services running on its cloud platform, Azure which is being used by various healthcare companies. Microsoft Genomics service, on Azure, enables scientists, data scientists and clinicians use cloud-based genomic processing services to manage the data-rich workloads. They have partnered with St. Jude Children’s Research Hospital to understand, treat and cure childhood cancer and other life-threatening diseases.

In India, Microsoft has partnered with Apollo hospitals to create an AI focused network for improving cardiovascular outcomes. Microsoft and Apollo have established National Clinical Coordination Committee (NCCC) to develop Cardiovascular Disease Risk Score using AI models. This committee consists of leading doctors from top notch medical institutes.

Google is another company which is betting big on healthcare. They are using their AI expertise and supporting healthcare companies in creating a new dimension for detection, diagnosis and treatment of diseases. Google is using its computer vision and predictive analytics to predict cardiovascular risk using patients eye scan. Normally, eye scan is used to check the signs for diabetic retinopathy. However, with advanced predictive analytics Google’s platform can not only predict the 5-year risk of patient developing retinopathy, it can also predict the cardiovascular risk. Based on past data, it has developed algorithm which has identified the relation between retinopathy and Cardiovascular disease and based on that it is able to predict.

These are just some of the examples and there is much deeper research being done now. Technology companies are primarily working as enablers and are set to transform the industry. It was a long awaited transformation and it will take more time to transform entire industry. Moreover, adaptation by the society shall be another hurdle, because changes is not a matter of overnight.

Radiology is another area which is being transformed by artificial intelligence. Due to AI’s power in reading and analyzing visual images, radiology is an area which will undergo significant disruption. Researchers at Stanford University have explored a model in which system driven diagnosis is used. To error is human and another study conducted on medical error (PAndey, 2018) where study concluded with the manmade error unintentionally. Medical care givers are always in precautionary mood to tackle the medical issues, but error take place anonymously. Burdened care givers may do mistakes while medical procedures but in the case of AI based services, rectifications of such issues are very easy. Work load of care givers reduce and chance of error is almost zero.

**Challenges before health care industry:** Future of technology in the healthcare looks bright, but it is not without its own sets of challenges. There are multiple challenges in the adoption of technology. Firstly, all the applications are still to be validated in real world settings. Secondly, healthcare is regulated industry guarded
heavily by the regulators. Any change in the existing
treatment or diagnostic patterns will need lot of data and
real world evidence before regulators make any change.
Additional challenge will be from incumbents, as many
of them will fear job losses for instance radiologists,
pathologists and many general physicians.

Though there are multiple challenges, however this
will also create newer jobs for data scientists and other
allied areas

**Measuring impact:** Though it is certain that
emerging technologies will impact the healthcare
ecosystem, however we will have to access the impact
and understand, if we are using technology only
because it is available or are we using it because it
really makes an impact. The impact has to be measured
on the core elements of healthcare delivery. Healthcare
delivery has several players ranging from hospitals to
physicians to pharmaceutical companies to pharmacy
chain to diagnostics. If we have to make an impact, then
we must create value which transcends all the elements
and eventually improves the life of the patient. Patient is
central and is the core theme for the healthcare industry to
effectively blend the two disciplines.

**Conclusion**

Data science and newer technologies are changing
the healthcare industry and are becoming an integral
part. Use of these technologies and tools will improve
the healthcare continuum and will make the care
more effective and predictive. Collaboration between
pharmaceutical companies and technology companies
will become the new normal and winners will be
the players who are effectively able to blend the two
disciplines.

While new technologies are likely to change the
narrative of the healthcare industry but the key outcome
should be measured by the impact it brings to patient’s
life. Any new technology should enhance patients
experience and must be measured by the impact it
creates on patient’s quality of life.

A technology based framework should be developed
by all stakeholders on which impact for each technology
should be measured. This framework should be the
guiding principal. Some of the key elements of this
framework are: does it improve the clinical outcome,
does it make the medicine more effective, does it help in
reducing the healthcare cost etc.?

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Differences of Gender in HIV- Risky Sexual Behavior among Adolescents and Parental Support in Luwuk City

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Abstract

The proportion of HIV AIDS prevalence currently continues to increase and disparate between women and men. Aim: to obtain an overview of HIV-risky sexual behavior among adolescents based on gender and parental support. This study was conducted using a cross-sectional study design on 385 adolescents (P = 50%) aged 15-18 years in high schools throughout Luwuk City selected through accidental sampling techniques. Adolescent sexual behavior and parental support were assessed using the Indonesia Global school-based student health survey (GSHS) Questionnaire. There were 26 adolescents (6.8%) had intercourse, men = 22 (85%) and women = 4 (15%). 9 adolescents (2.3%) had sex for the first time at age ≤ 11 years and 7 (1.9%) did it with four or more partners. 8 male adolescents (5.8%) and 1 female (0.4%) had intercourse with men and women (bisexual) and 48.8% of female adolescents did not know how to refuse an invitation to have sex. Parental support like communication is more frequent in females (39%) than males (33%). Better understand the problems of females (43.1%) than males (41.8%). There are still 10% of parents demeaning/dropping other males and 6% female. Most of the risky sexual behavior is found between male, while the support and attention of parents are mostly directed to female. There are needs to develop health education in elementary school to high school and counseling to parents.

Keywords: Sexual Behavior, Parental Support, Gender, Adolescent.

Introduction

Adolescence is a period of rapid growth and development both physically, psychologically and intellectually. The nature of adolescents has a great sense of curiosity, likes adventure, challenges and tends to dare to bear the risk of his actions without prior consideration.

Teenagers are residents in the age range of 10-19 years (WHO). The adolescent group accounts for 18% of the total population, which means that a fifth percent of the Indonesian population is adolescents and thus it becomes a threat regarding risky sexual behavior.1

The adolescent age group is one of the starting point phases of numerous health problems, including HIV and AIDS. As per the report of Risk and Protection: Youth and HIV/AIDS in Sub-Saharan Africa (2004), that adolescents and young adults who have sexually active are at greater risk than adults exposed to HIV, partly due to lack of knowledge and stimulation of sexual intercourse.3-6

Parental support is one pivotal factor in the formation of adolescent behavior.7 Several studies conducted in the adolescent age group have identified determinants of sexual behavior. Majority of this study that studied sexual behavior in Ethiopian teenagers already described potential contributors of adolescent sexual behavior such as awareness or attitude toward the risks of HIV and AIDS and communication of both parents and teenagers about health reproduction.8

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Numerous studies showed different proportions of HIV and AIDS prevalence between males and females. Consequently, there is a need to analyze the gender difference with respect to determinants and sexual behavior among adolescents to determine effective intervention strategies. Therefore, this present study aimed to describe adolescent’s sexual behaviors and parental support by gender.

### Method

This present study was a cross-sectional study design conducted in four high schools (SMAN) in Luwuk City in May-June 2018. The population of the study was all high school students of 1st, 2nd and 3rd grades. The number of samples was 385 students calculated using a proportion of 50% (P=0.5). Samples were selected through an accidental sampling technique. Adolescent sexual behaviors and parental supports were assessed using Indonesia’s Global school-based student health survey (GSHS) Questionnaire. As many as 20 enumerators were students at the Public Health Faculty of Tompotika University, Luwuk. Prior to the study, a training was given to enumerators as well as preparing survey instruments. Surveys were carried out at different times. Data collection for SMKN 1 Luwuk was completed on May 22, 2018. Data collection at SMAN1 Luwuk and SMAN 3 Luwuk was completed from May 30 to May 31, 2018. Meanwhile, data collection for SMAN 2 Luwuk was carried out on June 4, 2018.

### Results and Discussion

#### Table 1. Adolescent Characteristics in Luwuk City

<table>
<thead>
<tr>
<th>Variable</th>
<th>N (%) or Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>139 (36.1)</td>
</tr>
<tr>
<td>Females</td>
<td>246 (63.9)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>16.2 (0.9)</td>
</tr>
<tr>
<td><strong>Father's Occupation</strong></td>
<td></td>
</tr>
<tr>
<td>Civil Servant</td>
<td>15</td>
</tr>
<tr>
<td>Private sector worker</td>
<td>31</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>262</td>
</tr>
<tr>
<td>Farmer</td>
<td>64</td>
</tr>
<tr>
<td>Fisherman</td>
<td>8</td>
</tr>
<tr>
<td>Household Mothers</td>
<td>5</td>
</tr>
<tr>
<td><strong>Family Income</strong></td>
<td>2,181,000 (2,245,036)</td>
</tr>
</tbody>
</table>

Adolescence is a period of transition from childhood to adulthood. It is characterized by rapid physical changes, dramatic weight and height gains, changes in body shape and development of sexual characteristics such as enlargement of the breasts, development of the waist and mustache and depth of sound. This raises the interest of the opposite sex. In this development, the achievement of independence and identity is very prominent (increasingly logical, abstract and idealistic thinking) and more time is spent outside the family. 

The increasing prevalence of risky sexual behavior in Indonesia within a 5-year-period can be due to several factors including increasingly difficult life that requires both parents to work harder so they do not pay attention to their teenage children. In this study (Table 1) majority of the respondent’s father’s occupation are entrepreneurs such as salesmen, drivers, shipmen, building workers, etcetera. These types of working do not have fixed working time and tend to spend more time outside the home. Consequently, this also reduces the time to interact with the child. Under an economic perspective, the findings of this study indicate that the average family income is quite high (above the provincial minimum wage). Therefore, economic factors seem not to be a determinant in the formation of risky sexual behavior among adolescents.

Extramarital sex develops numerous negative impacts, such as unwanted pregnancy, decreased learning achievement, dropping out of school, depression and even increased suicide rates among adolescents the extramarital sex phenomenon among adolescents continues to increase. National data shows the greatest proportion of dating for the first time at the age of 15-17 years. At this age, concerns about not having life skills and appropriate knowledge are raised and thus adolescents are at great risk of engaging in unhealthy sexual behavior including extramarital sexual intercourse. In this present study, as many as 26 adolescents (6.8%) that are mostly males have had extramarital sex. Of those numbers, 9 adolescents (2.3%) had extramarital sex at the age of elementary school ((≤12 years old. Furthermore, 7 adolescents (1.9%) had sexual intercourse with ≥ 4 partners and 9 teenagers (2.3%) had sexual intercourse with both males and females (bisexual). Rates of condom use in adolescents who have premarital sex are also still relatively low. This will further increase the rate of transmission of sexually transmitted diseases. This study shows the rate of condom use in adolescents in the city of Luwuk is 3.9% (half of the proportion of adolescents who have premarital sex).
Table 2. HIV-Risky Sexual Behavior By Gender

<table>
<thead>
<tr>
<th>Variable</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Had sexual intercourse</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>22 (15.8)</td>
<td>4 (1.6)</td>
<td>26 (6.8)</td>
</tr>
<tr>
<td>No</td>
<td>117 (84.2)</td>
<td>242 (98.4)</td>
<td>359 (93.2)</td>
</tr>
<tr>
<td><strong>The first age of having sexual intercourse</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>117 (84.2)</td>
<td>242 (98.4)</td>
<td>359 (93.2)</td>
</tr>
<tr>
<td>≤ 12 years old</td>
<td>9 (6.4)</td>
<td>0 (0)</td>
<td>9 (2.3)</td>
</tr>
<tr>
<td>13-15 years old</td>
<td>9 (6.4)</td>
<td>2 (0.8)</td>
<td>11 (2.8)</td>
</tr>
<tr>
<td>16-18 years old</td>
<td>4 (2.9)</td>
<td>2 (0.8)</td>
<td>6 (1.7)</td>
</tr>
<tr>
<td><strong>Number of partners when having sexual intercourse</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>117 (84.2)</td>
<td>242 (98.4)</td>
<td>359 (93.2)</td>
</tr>
<tr>
<td>1</td>
<td>9 (6.5)</td>
<td>1 (0.4)</td>
<td>10 (2.6)</td>
</tr>
<tr>
<td>2</td>
<td>2 (1.4)</td>
<td>2 (0.8)</td>
<td>4 (1.0)</td>
</tr>
<tr>
<td>3</td>
<td>4 (2.9)</td>
<td>1 (0.4)</td>
<td>5 (1.3)</td>
</tr>
<tr>
<td>≥ 4</td>
<td>7 (5.0)</td>
<td>0 (0)</td>
<td>7 (1.9)</td>
</tr>
<tr>
<td><strong>The reason for delaying sexual intercourse</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have had sexual intercourse</td>
<td>22 (15.8)</td>
<td>4 (1.6)</td>
<td>26 (6.8)</td>
</tr>
<tr>
<td>Waiting for being old enough</td>
<td>8 (5.8)</td>
<td>5 (2.0)</td>
<td>13 (3.4)</td>
</tr>
<tr>
<td>Waiting for marriage first</td>
<td>58 (41.7)</td>
<td>141 (57.3)</td>
<td>199 (51.7)</td>
</tr>
<tr>
<td>At the risk of becoming pregnant</td>
<td>3 (2.2)</td>
<td>8 (3.3)</td>
<td>11 (2.9)</td>
</tr>
<tr>
<td>Risk of sexually transmitted diseases</td>
<td>(13 (9.4)</td>
<td>13 (5.3)</td>
<td>26 (6.8)</td>
</tr>
<tr>
<td>Have no chance</td>
<td>3 (2.2)</td>
<td>1 (0.4)</td>
<td>4 (1.0)</td>
</tr>
<tr>
<td>Breaking religious values</td>
<td>26 (18.7)</td>
<td>43 (17.5)</td>
<td>69 (17.9)</td>
</tr>
<tr>
<td>Other reasons</td>
<td>6 (4.3)</td>
<td>31 (12.0)</td>
<td>37 (9.5)</td>
</tr>
<tr>
<td><strong>Use of Condoms</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not have sexual intercourse</td>
<td>105 (75.5)</td>
<td>229 (93.1)</td>
<td>334 (86.8)</td>
</tr>
<tr>
<td>Used</td>
<td>13 (9.4)</td>
<td>2 (0.8)</td>
<td>15 (3.9)</td>
</tr>
<tr>
<td>Did not use</td>
<td>21 (15.1)</td>
<td>15 (6.1)</td>
<td>36 (9.4)</td>
</tr>
<tr>
<td><strong>Use of other contraception devices</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not have sexual intercourse</td>
<td>116 (83.4)</td>
<td>238 (96.7)</td>
<td>356 (92.0)</td>
</tr>
<tr>
<td>Used</td>
<td>6 (4.3)</td>
<td>3 (1.2)</td>
<td>9 (2.3)</td>
</tr>
<tr>
<td>Did not use</td>
<td>17 (12.2)</td>
<td>5 (2.0)</td>
<td>22 (5.7)</td>
</tr>
<tr>
<td><strong>Partners for having sexual intercourse</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>117 (84.2)</td>
<td>242 (98.4)</td>
<td>359 (93.2)</td>
</tr>
<tr>
<td>Only female</td>
<td>8 (5.8)</td>
<td>1 (0.4)</td>
<td>9 (2.4)</td>
</tr>
<tr>
<td>Only male</td>
<td>6 (4.3)</td>
<td>2 (0.8)</td>
<td>8 (2.0)</td>
</tr>
<tr>
<td>Both genders</td>
<td>8 (5.8)</td>
<td>1 (0.4)</td>
<td>9 (2.4)</td>
</tr>
<tr>
<td><strong>Having knowledge of how to reject sexual invitations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>54 (38.8)</td>
<td>126 (51.2)</td>
<td>180 (46.8)</td>
</tr>
<tr>
<td>No</td>
<td>85 (61.2)</td>
<td>120 (48.8)</td>
<td>205 (53.2)</td>
</tr>
</tbody>
</table>

Table 3. Parental Supports by Gender

<table>
<thead>
<tr>
<th>Variable</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parents check the child’s schoolwork</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>49 (35.3)</td>
<td>80 (32.5)</td>
<td>129 (33.5)</td>
</tr>
<tr>
<td>Almost never</td>
<td>10 (7.2)</td>
<td>21 (8.5)</td>
<td>31 (8.1)</td>
</tr>
<tr>
<td>Sometimes</td>
<td>39 (28.1)</td>
<td>96 (39.0)</td>
<td>135 (35.1)</td>
</tr>
<tr>
<td>Almost always</td>
<td>21 (15.1)</td>
<td>17 (6.9)</td>
<td>38 (9.9)</td>
</tr>
<tr>
<td>Always</td>
<td>20 (14.4)</td>
<td>32 (13.0)</td>
<td>52 (13.5)</td>
</tr>
</tbody>
</table>
Adolescents and young adults who actively have sexual intercourse are prone to a greater risk of HIV, partly because of low education level and sexual arousal. In this study, only 46.8% of adolescents knew how to reject a pre-marital sex invitation. Majority of them are (51.2%) and only 38.8% are males. The results of this study show that parents are likely to communicate with female adolescents (39%) than male adolescents (33%). This is in line with the tendency for adolescents who have sexual intercourse to be higher in men (15.8%) compared to women (1.6%). Furthermore, 5% of male adolescents have had sexual intercourse with ≥ 4 and no data recorded for females.

Parental supports positively affect safe sexual behavior among adolescents. The findings of this study show that only 36.9% of parents always communicate with their children, 23.4% always can understand child’s problem and only 39% of parents really know their child’s activities. The relationship quality between parents and adolescents corresponds to various sexual behaviors. For example, teenagers who reported that they have active relations with parents are unlikely to be sexually active. The results of this study also found that family involvement is associated with the sexual behavior of adolescents. Changes during the teenage period including change in sexual behavior have health consequences not only during adolescence but also during life. The unique characteristics and importance of adolescence require explicit and specific attention in determining health
programs and policies. Therefore, there are needs of supervision and assistance from various parties that play a role in the development phase of adolescents, including family support from parents, siblings and other family members, the neighborhood and the school environment.

Schools can develop activities that can engage parents to actively participate in child’s developments both cognitive, affective and psychomotor. These are related to adolescent’s perspectives on family involvement. The strategic purpose must be focused on the development of family involvement in adolescent’s daily life by encouraging parents to monitor their children’s whereabouts and provide personal and academic support.

Healthy premarital sexual behavior is directly affected by intention and indirectly by norms, attitudes, subjective norms, peer norms, education of mother and availabilities of health information (15). Previous studies about sex education and sexually transmitted disease which are curriculum-based programs show that these types of programs effectively delay the initiation of premarital sex, decrease the frequency of sex, or reduce the number of sexual partners (16,17,18,19). These programs are focused on cognitive developments namely knowledge; on sexual health issues, pregnancy, HIV and other sexually-transmitted diseases as well as preventive measures, perception; about risky pregnancy, HIV risk and other sexually-transmitted disease risks; individual values about sexuality and abstinence; Perceptions of peer norms and behavior about sex; Self-efficacy to reject sexual activity or decrease the number of sexual partners; Communication with parents or other adults about sexuality, condoms, or contraception.

**Conclusion**

Most of the risky sexual behavior is found in male adolescents, while the support and attention of parents are more directed at female adolescents. There are needs of health education starting from junior high school level; there is a counseling board targeted for parents of students; schools need to develop activities that engage parents to actively participate in affective and psychomotor development and can establish communication between parents and adolescents; strengthened health education through electronic media that contains persuasive advertisements to prevent health problems in adolescents.

**Ethical Clearance:** Our study was not directly applied on human, hence ethical clearance was not required.

**Source of Funding:** Self funding.

**Conflict of Interest:** The author declare that he has no conflict of interest.

**Reference**

1. Indonesian Ministry of Health. Adolescent reproductive health situation Info Datin. Ministry of Health Data and Information Center.
10. Shu et al. Association between age at first sexual


Effect of Marital Status on Completeness of Antenatal Care Visits among Childbearing Age Women in Rural Indonesia

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Abstract

Marital status has a special meaning for pregnant women in Indonesia. A woman who is pregnant without a husband is a disgrace. The purpose of this study was to analyze the effect of marital status on completeness of antenatal care (ANC) visits among childbearing age women in rural Indonesia. The research utilizes the 2017 Indonesian Demographic and Health Survey (IDHS) data. The unit of analysis for women aged 15-49 years old in rural Indonesia. The sample size of 7,783 women. The dependent variable was ANC visits. The independent variable was marital status, education level, parity, wealth status and health insurance. Analysis using Binary Logistic Regression for the final test. The results of the analysis found that married women have 1.834 times higher probability than no spouse women to make complete ANC visits. While women living with partners found no significant differences with no spouse women. Married women have a better chance of making complete ANC visits than no spouse women and women living with partners. Other variables that also affect the completeness of ANC visits are age, parity, wealth status and health insurance. It could be concluded that marital status influences the completeness of ANC visits among childbearing age women in rural Indonesia.

Keywords: Marital status, antenatal care, maternal health, rural.

Introduction

The main causes of death of pregnant women in Indonesia in 2017 are hypertension in pregnancy and postpartum hemorrhage. According to the Directorate General of Health Service, these two causes should be minimized if Antenatal Care (ANC) quality standards can be maintained properly¹.

Previous research found that the low ANC visit in Indonesia is influenced by the level of knowledge of pregnant women about the benefits of ANC visits. The study revealed that more pregnant women were negative. Apart from the low level of knowledge, it is also likely due to the lack of husband support. On the other hand, it was revealed the attitude of the midwife who was deemed unfriendly during the ANC visit². Community perspectives are known to influence people’s access to health services³. Another study found that the distance factor of a pregnant woman’s residence to the ANC also influenced the motivation of the pregnant woman to visit. Great distances make mothers think twice about visiting ANC⁴. Long distances and expensive service costs are known to be one of the barriers to the public access to health services⁵,⁶.

The maternal mortality rate (MMR) is an indicator of the quality of life of women. Indonesia has succeeded in reducing MMR from 390 to 334 per 100,000 live births in 1997. Then experienced success again in 2007 reducing MMR to 228 per 100,000 live births⁷. MMR
in Indonesia experienced a fairly high increase in 2015. According to the 2015 Intercesnal Population Survey (SUPAS) to 305 per 100,000 live births. This position is high among countries in ASEAN. Indonesia is lower than the MMR achieved by Laos, while compared to other ASEAN members, Indonesia is still the highest\(^8\).

Early marriage may be one of the factors triggering the high MMR in Indonesia. In 2018, around 1.2 million women will marry at the age of fewer than 18 years. Nationally, the percentage trend of women aged 20-24 years whose age at first marriage is less than 18 in 2018 has increased. Note this figure when compared with 2015-2017. When compared between rural and urban areas, early marriage is more common in rural areas\(^9\). The phenomenon of early marriage in Indonesia is also supported by cultural practices by ethnic groups in Indonesia\(^10\)–\(^12\).

Based on the background, this study was conducted to analyze the effect of marital status on completeness of ANC visits among childbearing age women in rural Indonesia. The results of the analysis in this study help policymakers to minimize the impact of marital status on the completeness of the ANC.

**Materials and Method**

**Data Source:** The study utilizes the 2017 Indonesian Demographic Data Survey (IDHS) data. The unit of analysis was women aged 15-49 years old who had given birth in the last 5 years in rural Indonesia. Taking the 2017 IDHS sample using stratification and multistage random sampling method, to obtain a sample size of 7,783 women.

**Procedure:** The 2017 IDHS has obtained ethical clearance from the National Ethics Committee. The respondents’ identities have all been deleted from the dataset. Respondents have provided written approval for their involvement in the study. The author has obtained permission to use the data for this study through the website: https://dhsprogram.com/data/new-user-registration.cfm.

**Data Analysis:** The Ministry of Health of the Republic of Indonesia recommends that the ANC during pregnancy be done at least 4 times, namely in the first trimester 1 time, in the second trimester 1 time and in the third trimester 2 times. Based on this information, ANC visits are divided into 2 categories, namely incomplete ANC visits (<4 times) and complete ANC visits (≥ 4 times)\(^13\).

Marital status was divided into 3 categories, namely no spouse, married and living with partners. Other independent variables were age, education level, parity, wealth status and health insurance. Education level consists of 4 categories, namely no education, primary, secondary and higher. Parity consists of 3 categories, namely primiparous (<2), multiparous (2-4) and grande multiparous (> 4). Wealth status consists of 5 categories, namely the poorest, poorer, middle, richer and richest. Health insurance consists of 2 categories, namely not having health insurance and having health insurance.

At the initial stage, the Chi-square test was used for categorical variables and the T-test for continuous variables (age). Because of the nature of the dependent variable, Binary Logistic Regression was used for the final test to determine disparity. SPSS 22 software was used for all stages of statistical analysis.

**Findings:** Table 1 shows the cross-tabulation between marital status and other related variables. Based on ANC visits, all marital status categories are dominated by women of childbearing age who have complete ANC visits (≥4 times). By age, married women have a slightly older average age.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Marital Status</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Spouse</td>
<td>Married</td>
</tr>
<tr>
<td>ANC visits</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>&lt;4 (ref.)</td>
<td>66</td>
<td>25.5%</td>
</tr>
<tr>
<td>≥4</td>
<td>193</td>
<td>74.5%</td>
</tr>
</tbody>
</table>

\(***<0.001\)
Variables | Marital Status | P
|----------------|----------------|---
| | No Spouse | Married | Living with Partner |
| Age (mean) | 259 | 7350 | 174 | 26.44 | ***<0.001 |
| Education Level | 0.121 |
| • No education | 7 | 156 | 9 | 2.7% | 2.1% | 5.2% |
| • Primary | 80 | 2449 | 53 | 30.9% | 33.3% | 30.5% |
| • Secondary | 142 | 3778 | 93 | 54.8% | 51.4% | 53.4% |
| • Higher | 30 | 967 | 19 | 11.6% | 13.2% | 10.9% |
| Parity | ***<0.001 |
| • Primiparous | 126 | 2141 | 89 | 48.6% | 29.1% | 51.1% |
| • Multiparous | 114 | 4476 | 78 | 44.0% | 60.9% | 44.8% |
| • Grande multiparous | 19 | 733 | 7 | 7.3% | 10.0% | 4.0% |
| Wealth status | ***<0.001 |
| • Poorest | 143 | 3086 | 156 | 55.2% | 42.0% | 89.7% |
| • Poorer | 50 | 1775 | 11 | 19.3% | 24.1% | 6.3% |
| • Mide | 40 | 1236 | 6 | 15.4% | 16.8% | 3.4% |
| • Richer | 17 | 819 | 1 | 6.6% | 11.1% | 0.6% |
| • Richest | 9 | 434 | 0 | 3.5% | 5.9% | 0.0% |
| Health insurance | **0.002 |
| • No | 129 | 3025 | 87 | 49.8% | 41.2% | 50.0% |
| • Yes | 130 | 4325 | 87 | 50.2% | 58.8% | 50.0% |

Note: *p <0.05; **p <0.01; ***p <0.001.

Based on education level, all marital status categories are dominated by women with secondary education. Based on parity, no spouse women and women living with partners are dominated by primiparous women, while married women are dominated by multiparous women.

Table 1 shows that based on wealth status, all marital status categories are dominated by women who have wealth status in the poorest category. Based on health insurance ownership, all marital status categories are dominated by women who have health insurance.

Table 2 is the result of the binary logistic regression test. Table 2 informs that married women are 1.834 times more likely than no spouse women to make complete ANC visits (OR 1.834; 95% CI 1.360-2.474). While women living with partners found no significant differences with no spouse women.

Table 2. Result of Binary Logistic Regression of Completeness of Antenatal Care Visits among Childbearing Age Women in Rural Indonesia(n=7,783)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>≥4 ANC visits</th>
<th>P</th>
<th>OR</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital status: No spouse</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Marital status: Married</td>
<td>***&lt;0.001</td>
<td>1.834</td>
<td>1.360</td>
<td>2.474</td>
<td></td>
</tr>
<tr>
<td>Marital status: Living with partner</td>
<td>0.082</td>
<td>1.505</td>
<td>.950</td>
<td>2.385</td>
<td></td>
</tr>
</tbody>
</table>
In the Indonesian context, women who become pregnant without a partner are disgrace\textsuperscript{14}. Women who are pregnant outside of marriage do not dare to go out and socialize with the community. This condition encourages not to make ANC visits. So it can be understood if the utilization of ANC is low.

Table 2 shows that age is one of the determinants of complete ANC visits. Table 2 informs that multiparous women are 0.685 times more likely than primiparous women to make complete ANC visits (OR 0.685; 95% CI 0.575-0.815). Grande multiparous women are 0.238 times more likely than primiparous women to make complete ANC visits (OR 0.238; 95% CI 0.181-0.313). This information shows that the higher the parity, the lower the possibility of making complete ANC visits. The effect of parity on the completeness of ANC visits was also found in several previous studies in China, Afghanistan, Guatemala, India, Kenya, Pakistan and Zambia\textsuperscript{15–17}.

Table 2 shows that women with wealth status in the poorer category are 2.073 times more likely than the poorest women to have complete ANC visits (OR 2.073; 95% CI 1.754-2.451). Women with wealth status in the middle category are 2.607 times more likely than primiparous women to make complete ANC visits (OR 2.607; 95% CI 2.113-3.217). Grande multiparous women are 0.238 times more likely than primiparous women to make complete ANC visits (OR 0.238; 95% CI 0.181-0.313). This information shows that the higher the parity, the lower the possibility of making complete ANC visits. The effect of parity on the completeness of ANC visits was also found in several previous studies in China, Afghanistan, Guatemala, India, Kenya, Pakistan and Zambia\textsuperscript{15–17}.

Table 2 shows that women who have health insurance are 1.464 times more likely than women who do not have insurance to make complete ANC visits (OR 1.464; 95% CI 1.286-1.666). This information shows that having health insurance is a supporting factor for a complete ANC visit. Information on the results of this study is consistent with the objectives of the National Health Insurance (NHI), which was initiated by the government since 2014. The NHI is intended to increase public access to health care facilities\textsuperscript{23}. The results of the analysis of this study indicate that NHI is on the right path.

### Conclusions

Based on the results of the study it could be concluded that marital status influences the completeness of ANC among childbearing age women in rural Indonesia. Married women have a better chance of making complete ANC visits than no spouse women. Other variables that also affect the completeness of ANC visits were age, parity, wealth status and health insurance.
Acknowledgments: The author would like to thank the ICF International, who has agreed to allow the 2017 IDHS data to be analyzed in this article.

Source of Funding: Self-funding

Conflict of Interests: The authors declared no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

References


Retrospective Analysis of Pattern of Injuries in Road Traffic Accidents: An Autopsy Based Study

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Abstract

Accidents are a counter product of modernization and hasty life and are considered as a modern day epidemic. A study was undertaken in Department of Forensic Medicine, G.M.C.H. to study of the pattern of injuries in the victims of road traffic accidents. An autopsy-based, purposive random sampling technique was applied to select the study sample of 150 post-mortem examination cases of road traffic accidents. The data collected during the study period was thoroughly analysed. Results showed that almost 90% (89.33%) of the victims were male. At least 44 (29.33%) victims were of 21-30 years which was the most common age group involved. Early detection of the injury and prompt treatment are necessary in saving the lives of many of these victims. So, it is clear that multidisciplinary approach is required to prevent deaths resulting from vehicular accidents.

Keywords: Road traffic accidents, pattern, injury, fatal, prevent.

Introduction

Worldwide the number of people killed in road traffic crashes each year spastically estimated to be around 1.2 million, while the number of injured could be as high as 50 million.¹ It has been predicted that by 2020, Road traffic accident will rank as high as third among causes of disability adjusted life years lost.² 90% of the world’s fatalities on the roads occur in low- and middle-income countries, even though these countries have approximately 54% of the world’s vehicles. Road traffic accidents are the major cause of unnatural deaths among people aged between 15 and 29 years.

Estimates suggest that in India rate of death per 1000 vehicles is 1.3. According to the National Crime Records Bureau (NCRB)³ of India, the number of accidental deaths in Assam stood at 2384 in the year 2015, While Arunachal Pradesh and Sikkim reported 177 and 75 respectively in the same year. As per bibliometric analysis, our country contributed only 0.7% research papers and articles on road traffic injuries and had less than one article on road traffic injuries per 1,000 road traffic related deaths. Accidents hence have to be studied in terms of an epidemiological model (agent, host and environmental factors) and analyzed in respect to time, place and person distribution.

Material and Method

An autopsy-based observational, cross-sectional study was conducted at the Gauhati Medical College and Hospital, Guwahati from 1st July 2017 to the 30th June, 2018. A purposive random sampling technique was applied to select the study sample of 150 post-mortem examination cases of road traffic accidents subjected to medico-legal autopsy at the department of Forensic Medicine, Gauhati Medical College & Hospital. A pre-tested proforma was used by the investigator for interviewing the police personnels and relatives of RTA victim
Decomposed bodies and have been exempted from the study:

Cases with no definitive history have also been excluded from the study: Data about vehicular accidents were obtained regarding age and gender of the victims, time and place of accident, type of vehicle involved in the accident, the type of injuries sustained, type of road users (pedestrians, riders, or pillions), the outcome of the accident, etc., in a self-designed pro forma (questionnaire). Data collected for each parameter were tabulated and entered into the computer using the Microsoft Excel software for further analysis.

Results

Sex and Age of Victims: The age of the victims ranged from 5 years to 78 years. The victims were divided according to their age into 7 groups. The peak incidence was observed in the age group of 21-30 years comprising of 64 cases (27.24%) followed by 31-40 years age group with 57 cases (24.26%). The age wise distribution of cases is shown in the figure 1.

![AGE DISTRIBUTION OF VICTIMS](image)

**Fig. 1: Age distribution of victims**

It is observed that among the 150 cases studied, 134 were male comprising 89.33% and 16 were females comprising 10.66%. The male to female ratio in the present study is 8.37:1.

Time of Incident:

<table>
<thead>
<tr>
<th>Part of the day</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 midnight to 6 AM</td>
<td>19</td>
<td>12.66</td>
</tr>
<tr>
<td>6 AM to 12 noon</td>
<td>26</td>
<td>17.33</td>
</tr>
<tr>
<td>12 noon to 6 PM</td>
<td>51</td>
<td>34</td>
</tr>
<tr>
<td>6 PM to 12 midnight</td>
<td>54</td>
<td>36</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>100%</td>
</tr>
</tbody>
</table>

Highest number of incidents of the present study occurred in between 6 PM to 12 midnight (36%) followed by almost equal number of cases in between 12 noon to 6 PM (34%).

Period of survival: A huge number of victims died instantaneously or on the spot (31.33%). 11.33% victims died within 1 hour and 23.33% died in between 1 hour to 6 hour.

Type of Victims and Vehicles involved: It is evident from figure 2 that a huge proportion of cases were pedestrians, 55 (36.66%) followed by 2-wheeler rider and occupant.
In the present study trucks and cars are the mostly involved vehicle, 37(24.66%) in case of trucks and 33(22%) in case of cars, followed by bus and motorcycle, each in 23(15.33%) cases. In 5 cases vehicle was not known.

**Pattern of injuries:** The numbers of cases with injuries in different sites of the body are shown in the table no. 2.

**Table 2: Site of injury of the victims**

<table>
<thead>
<tr>
<th>Place of injury</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest+Head</td>
<td>8</td>
<td>5.33</td>
</tr>
<tr>
<td>Chest+Abdomen</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Chest+Limbs</td>
<td>4</td>
<td>2.66</td>
</tr>
<tr>
<td>Chest+Head+Abdomen</td>
<td>2</td>
<td>1.33</td>
</tr>
<tr>
<td>Chest+Head+Limbs</td>
<td>52</td>
<td>34.66</td>
</tr>
<tr>
<td>Chest+Abdomen+Limbs</td>
<td>19</td>
<td>12.66</td>
</tr>
<tr>
<td>All regions</td>
<td>65</td>
<td>43.33</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>100</td>
</tr>
</tbody>
</table>

In the present study most of the victims (65 or 43.33%) had injury on all regions of the body, followed by Chest+Head+Limbs (52 or 34.66%). None of the victims had injury only on chest. Along with other regions limbs are involved in most of the cases (140 or 93.33%).

Abrasion on the body was found in total 103 cases. Out of these, associated contusion was present in 80 cases and associated laceration was found in 33 cases. In 3 cases no external injuries were found as depicted in figure no. 3.

Lungs were injured in 77 cases (51.34%) among the total 150 cases. It was observed that heart was injured in a total number of 8 cases (5.34%). Liver was involved in 55 cases (74.32%) of total cases with intra abdomino-pelvic injuries. Lacerations were present on 48 cases (64.86%), Contusion on 3 cases (4.05%) and crush injuries over 4 cases (5.4%).
Spleen was involved in 29 cases: In 14 cases injuries were detected over kidney. Out of 14 cases, in 3 cases it was present over right kidney and in 7 cases injuries were present over left kidney while in 4 cases it was bilaterally present.

Cause of death: Coma without haemorrhage and shock is the most common cause of death (41.24%) followed by haemorrhage and shock without coma (32.67%). Death was instantaneous in 13.95% cases.

Table 3: Causes of death among the victims

<table>
<thead>
<tr>
<th>Cause of death</th>
<th>No. of victims due to vehicular accidents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coma</td>
<td>476</td>
<td>41.24%</td>
</tr>
<tr>
<td>Haemorrhage and shock</td>
<td>377</td>
<td>32.67%</td>
</tr>
<tr>
<td>Coma + haemorrhage and shock</td>
<td>107</td>
<td>9.27%</td>
</tr>
<tr>
<td>Instantaneous</td>
<td>161</td>
<td>13.95%</td>
</tr>
<tr>
<td>Exhaustion</td>
<td>7</td>
<td>0.61%</td>
</tr>
<tr>
<td>Spinal shock</td>
<td>19</td>
<td>1.64%</td>
</tr>
<tr>
<td>Syncope</td>
<td>7</td>
<td>0.61%</td>
</tr>
<tr>
<td>Total</td>
<td>1154</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Discussion

In the present study, peak incidence was observed in the age group of 21-30 years comprising of 44 (29.33%) cases. This is closely followed by age group 31-40 years with 37 (24.66%) cases and 41-50 years with 25 (16.66%) cases. This means that 106 (70.67 % of total) people lost their in prime of their life. Age groups 0-10 years (7 cases), 51-60 years (11 cases) and >61 years (9 cases) have less number of cases. These findings are consistent with Goyal A. et al.(2014)⁴, Reddy N. B. (2014)⁵, Shrivastava S. R. (2014)⁶, Seid M. et al. (2015)⁷, Sharma S. M. (2016)⁸, Singh S.K. (2017)⁹, Smith et al. (2017)¹⁰.
In the present study males comprises a majority (89.33%) compared to female who were only 11%. Male to female ratio is 8.37:1 which is congruent with Goyal A. et al.(2014)\(^4\), Reddy N. B. (2014)\(^5\), Shrivastava S. R. (2014)\(^6\), Seid M. et al. (2015)\(^7\), Sharma S. M. (2016)\(^8\) and Singh S.K. (2017)\(^9\).

The reason for the male majority is the patriarchal setup of our society where men are exposed to outdoor activities to earn bread and other work, travelling between the home and place of work, while women mostly remain indoors at the home involved in household work.

Highest number of cases died in accidents that took place in between 6 PM to 12 midnight (36%) followed by almost equal number of cases in between 12 noon to 6 PM (34%). So total of 70% accidents are found to occur between 12 noon to 12 midnight.

These findings are consistent with NCRB (2015)\(^3\). This can be due to the people returning from place of work and activity at that time leading to traffic rush, fatigue of the people nearing the end of day, improper driving condition in the dark and people visiting commercial places more at that time of the day.

In this study a huge proportion of cases were pedestrians (36.67%) followed by two wheeler rider (32.67%). These findings are consistent with Sharma S.M. (2016)\(^8\).

High incidence of pedestrians (36.67%) among the victims (most common age group 30-41 years) may primarily be due to increasing number of people on the road, ignorance of the people about traffic rules and discipline, lack of proper walking lanes in the streets. Next are the riders of 2-wheeler majority of which comprises of students and young professionals (most common age group 21-30 years) whose enthusiasm for speed and adventure make them prone to such accidents. Poorly maintained roads and lack of balance of the vehicle itself are important factors.

In the present study trucks and cars are the mostly involved vehicle, 37 cases (24.67%) and 33 cases (22%) respectively, followed by bus and motorcycle, each in 23 cases (15.34%). Among these four wheelers are most common. These findings are consistent with, Goyal A. et al.(2014)\(^4\) and Sharma S.M. (2017)\(^8\).

Guwahati city is a huge business and education centre of North East India. So, lots of people travel to and from the city for all sorts of purposes like business and educational purposes. City has increasingly high number of 4 and 2 wheelers with same narrow lane roads. Parking facilities are inadequate, so vehicles are parked on already stressed roads. National highway passes through the outskirts of the city with lots of heavy vehicles. Construction activities are on rise due to economic growth.

In this study majority of victims died within 1 hour of accident including those who died instantaneously (total 42.66%). 35 victims (23.34%) died within 1 hour to 6 hour. Total 115 victims (76.67%) died within 24 hours following accident which is the most crucial period in management.

These findings are consistent with Reddy N.B. (2014)\(^5\).

These findings highlight the importance of the Golden Hour in the management of trauma and emergency. The first hour after any accident is the most crucial and survival increases if care and treatment is provided to victims on the spot and on the way to hospitals.

In this study, incidence of thoraco-abdominal injury among all cases of vehicular accident is 48.7%. In all the cases (150 cases) chest injury is associated with one or more other region injury. In majority of cases (43.33%) all regions of the body are involved. Head injury is associated with total 84.65% cases.

External injuries were found in 150 cases of the study. Among all the cases 4 (2.67%) victims have internal injury without external injury and 35 (23.34%) victims have external injury without internal injury. Abrasion is present in 18 victims and contusion is present in 43 victims. From the above observation it can be said that from external examination of a victim it is difficult to judge the extent of internal injury in a significant number of cases.

Laceration of lung is more common than contusion and bilateral involvement is more common than unilateral injury. Right side involvement is more common than left side. In three case lungs are crushed. Again lung involvement is most common in pedestrians.

Heart was injured in a total number of 8 cases (5.34%), on the basis of naked eye examination and histopathological examination. Laceration is more
common than contusion. In one case heart is found to sustained crush injury. Among the different types of victims, heart is most commonly involved in pillion rider (16.67%). These finding are almost consistent with Reddy et al. (2014)\textsuperscript{5} and El-Menyar (2016)\textsuperscript{11}.

In the present series, liver injuries were observed in 55 cases comprising the highest number of cases. Majority of the cases had involvement of right lobe of the liver and anterior surface of the liver. Similar findings have been described by Gushinge and Kadu (2017)\textsuperscript{12}. In the present study pedestrians have been found to be involved in 14 cases.

There were 29 cases of spleen injuries in almost all circumstances the spleen was lacerated (26 cases). Spleen is the next solid organ after liver to be injured most. Spleen injuries associated with rib fractures have also been reported by Reddy et al (2014)\textsuperscript{5}.

In the present study, kidney was involved in 14 cases (18.91%). Of these 14 cases, 2 cases were lacerated, 9 cases were contused and 1 was crushed. High incidence of kidney injuries was involved in the study of Gushinge and Kadu (2017)\textsuperscript{12}. In the present series majority was lacerated due to blunt force impact resulting from vehicular accidents.

In this study coma without haemorrhage and shock is the most common cause of death (41.24%) followed by haemorrhage and shock without coma (32.67%). Death was instantaneous in 13.95% cases.

**Conclusion and Recommendations**

Vehicular accidents continue to be a growing menace, incurring heavy loss of valuable man-power and human resources, along with a corresponding drain of potential economic growth. Primarily three factors comprise road safety - infrastructure (roadways), vehicle design and human behaviour. So, we suggest following strategies to prevent road traffic incidents -

- Enforcement of traffic laws especially to control speed, use of safety belts and road worthy vehicles should be enhanced.
- Safe crossings and sidewalks or separate paths and lanes for pedestrian and cyclists should be built.
- First aid at the scene of crash and appropriate medical care in emergency rooms is a must to save life of the victim.

Hospitals with trauma units should be built along major highways for quick access for post crash victims.

In modern days of busy life with stress and strains many people are fraught with worries and anxieties. This has a deleterious effect on the power of mental concentration which is very much essential in driving. Another important factor in incidents of road traffic accidents is that people talk on their mobile phone while driving which reduces concentration on vehicle by the driver. So banning of mobile phone while driving which is to be strictly implemented. Another detrimental factor in incidents of vehicular accidents is the influence of alcohol and drugs on the drivers. The use of alcohol measuring gadgets may solve this factor. Value of seat belt and crash helmets is very much important in preventing fatal injuries.

So, it is clear that multidisciplinary approach is required to prevent deaths resulting from vehicular accidents.

**Funding:** None

**Conflict of Interest:** There are no conflicts of interest

**Ethical Clearance:** Obtained

**References**

5. Reddy NB, Hanumantha null, Madithati P, Reddy NN, Reddy CS. An epidemiological study on pattern of thoraco-abdominal injuries sustained in fatal road traffic accidents of Bangalore: Autopsy-


The Correlation between Bacteria and Parasite Patterns on Flies with Prevalence of Fly Vector-Borne Disease at the Market and the Landfill in Jember District, Indonesia

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Abstract

Fly vector-borne diseases are the potential disease that can trigger an outbreak. The fly lives in a dirty place with poor sanitation, such as the market and the landfill. Some pathogens that can be transmitted by flies mechanically were bacteria such as Escherichia coli, Shigella, Salmonella, Vibrio cholera and parasites such as Balantidium coli, Entamoeba histolytica and Giardia lamblia. This study aimed to analyze the correlation between bacteria and parasite patterns on flies and the prevalence of fly vector-borne diseases. This research was conducted from May 2019 to March 2020. The flies samples were collected randomly at each research location, i.e., Tanjung Market and the Pakusari landfill. The bacteria and parasites identifications were carried out at the Microbiology and Parasitology Laboratory, Faculty of Medicine, University of Jember. The data of disease prevalence was collected in a cohort from the health centers around research locations. This study found three bacteria in market samples, 18 cases of fly vector-borne diseases and four bacteria in the landfill samples and 10 cases of fly vector-borne disease. The study indicated a significant correlation between bacteria and parasite patterns on flies with the prevalence of fly vector-borne diseases in the market, but no correlation in the landfill.

Keywords: Bacteria, Fly, Parasite, Vector-borne Disease.

Introduction

Fly vector-borne diseases are the potential disease that can trigger several extraordinary infectious diseases such as diarrhea, typhoid fever, dysentery and cholera. Flies are a type of vector that can carry germs on their bodies. They live close to humans and are often associated with sanitation problems. Environments with poor sanitation tend to attract flies as breeding place and feed them, they including the market and landfill. Those areas are suspected related to the incidence and spread of infectious diseases where pathogens originate from these places.

Fly can transmit the disease to humans mechanically by carrying microorganisms attached to their bodies to such media. Studies reported the pathogens that are transmitted mechanically by flies are Escherichia coli, Shigella, Salmonella, Vibrio cholera and parasites such as Balantidium coli, Entamoeba histolytica, Giardia lamblia. A species of fly, Musca domestica can transmit pathogens such as Campylobacter, E.coli, Salmonella sp., and Shigella sp16. Previous studies on the detection of fly vector-borne diseases found the occurrence of diarrhea, dysentery, typhus and cholera in Jember District 20196. The epidemiological study of vector-borne diseases showed the interconnection of three factors, i.e., human host, infectious agent (parasite, bacteria in

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the fly’s body) and the environment where the place of the fly vector life. This study analyzed the role of flies in transmitting vector-borne diseases in Jember Regency, especially in an environment where the flies can breed and live easily, i.e., the market and the landfill.

**Method**

The research was conducted at the Tanjung market and the Pakusari landfill in May 2019 to March 2020. This research has received ethical clearance from the Ethical Committee of Health Research of Faculty of Dentistry, the University of Jember, with the reference number.632/UN25.8/KEPK/DL/2019. The sampling technique was carried out randomly at each location in November 2019. Researchers set a fly trap that was equipped with jackfruit bait with a strong aroma to catch flies. The caught flies were put into a sterile tube containing NaCl30ml and marking each location and divided into two parts. The sample was analyzed at the Laboratory of Microbiology and Parasitology, Faculty of Medicine, the University of Jember. The bacterial identification was performed by selective media culture and several biochemical tests. The identification of parasites was made by microscopical examination. The prevalence data of fly vector-borne diseases was provided in a cohort method from the health service around each research location. It was collected in the period of November-December 2019.

**Research Findings:** Bacterial identification of samples from the Tanjung Market found three types of bacterial patterns that are considered as *Escherichia coli*, *Salmonella* sp and *Shigella* sp. Meanwhile, the samples from the Pakusari landfill showed four types of bacterial patterns, which were suspected as *Escherichia coli*, *Salmonella* sp, *Shigella* sp. and *Vibrio cholerae*, as shown in Table 1 and Table 2.

<table>
<thead>
<tr>
<th>Sample Location</th>
<th>Bacteria</th>
<th>Biochemical Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>KIA</strong></td>
</tr>
<tr>
<td>Market</td>
<td>E.coli</td>
<td>S = Alk</td>
</tr>
<tr>
<td></td>
<td>Salmonella</td>
<td>S = Alk</td>
</tr>
<tr>
<td></td>
<td>Shigella</td>
<td>S = Alk</td>
</tr>
<tr>
<td></td>
<td>Vibrio cholera</td>
<td>S = Alk</td>
</tr>
<tr>
<td>Landfill</td>
<td>E.coli</td>
<td>S = Alk</td>
</tr>
<tr>
<td></td>
<td>Salmonella</td>
<td>S = Alk</td>
</tr>
</tbody>
</table>
### Table 2. The Patterns of Bacteria and Parasites on Flies through Selective Media Culture Method and Microscopic Observations from Each Location

<table>
<thead>
<tr>
<th>Bacteria/Parasite</th>
<th>Agar Media</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Market</td>
<td>Landfill</td>
</tr>
<tr>
<td>Esherichia coli</td>
<td>EMB</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Shigella</td>
<td>SS</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Salmonella</td>
<td>SS</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Vibrio cholera</td>
<td>TCBS</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Entamoeba histolytica</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Balantidium coli</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Giardia lamblia</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Explanation:** EMB = Eosin Methylene Blue; SS = Salmonella-Shigella; TCBS = Thiosulfate-Citrate-Bile-Sucrose

Table 3 showed that the prevalence of fly vector-borne disease around the market place was 18 cases, while from the landfill was 10 cases of fly vector-borne disease.

### Table 3. The Prevalence of Fly vector-borne Disease around research Location During November – December 2019

<table>
<thead>
<tr>
<th>Location</th>
<th>Prevalence of Fly vector-borne Disease</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Diarrhea</td>
<td>Typhoid</td>
</tr>
<tr>
<td>Market</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Landfill</td>
<td>8</td>
<td>2</td>
</tr>
</tbody>
</table>

### Table 4. The Data Analysis on the Correlation of Bacterial and Parasite Patterns and the Prevalence of Fly Vector-borne diseases around research Location

<table>
<thead>
<tr>
<th>Location</th>
<th>Bacterial Pattern x Disease Prevalence</th>
<th>Statistical analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market</td>
<td>3*79</td>
<td>value = 21,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Asymp. Sig = 0,013</td>
</tr>
<tr>
<td>Landfill</td>
<td>4*165</td>
<td>value = 14,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Asymp. Sig = 0,082</td>
</tr>
</tbody>
</table>

**Explanation:** value = crosstab value; Asymp. sig = significance value
This study found three patterns of bacteria but no parasite around the market place. The prevalence of fly vector-borne diseases around the market was 18 cases. The statistical analysis using Chi-Square resulted value of 21,000 and a significance value of 0.013, which was fewer than $\alpha$ (0.05), indicated its correlation, as shown in Table 4. Furthermore, this research found four patterns of bacteria and no parasite around the landfill. The prevalence of fly vector-borne disease around the landfill was 10 cases. The statistical test by Chi-Square showed a value of 14,000 and a significance value of 0.082, which was higher than $\alpha$ (0.05), implicated no correlation.

**Discussion**

The method to analyze the pathogen can be performed by microscopic, selective media culture, as well as serological examination. In this research, a selective media culture examination was performed to identify bacteria. The Eosin Methylene Blue (EMB) identified Escherichia coli, the Salmonella-Shigella Agar (SSA) identified Salmonella sp and Shigella sp and the Thiosulfate-Citrate-Bile-Sucrose (TCBS) selected for Vibrio cholerae. For each media (EMB, SSA, TBCS), we conducted several biochemical tests such as Kligler Iron Agar (KIA), Indole test, Methyl Red (MR) test, Voges Proskauer (VP) test, MIO test and citrate test on each sample location. The KIA test on each agar media (EMB, SS, TBCS) measured the ability to produce slope (S), base (B), hydrogen sulfide (H$_2$S) and damp as the basis to identify a particular pattern of bacteria and its growth on each media$^5$. For the identification of the parasite on Giardia lamblia, Entamoeba hitalystica and Balantidium coli was done through the microscopical examination by 1000x magnification.

The sample from the market showed three types of bacteria, i.e., Escherichia coli, Salmonella sp., and Shigella sp, but no parasites. The result is in accordance with the research done by Safitri$^{16}$, which has found the dominant pattern of Escherichia coli, Salmonella sp., Shigella sp, and Staphylococcus bacteria within the fly around markets in Surabaya. Moreover, Escherichia coli bacteria was a group of Coliform bacteria that could stay in the human and cattle digestive tract. In a certain amount, Coliform bacteria could cause indigestion problems like diarrhea. According to Lima et al$^{12}$, E.coli was a pathogen that can cause diarrhea and transmitted to the human through fly mechanically. Escherichia coli, Shigella spp., Salmonella spp. bacteria around the Tanjung Market were found and derived from contaminated foodstuff, fruit and vegetable because of dust and soil exposure.

This research found 18 cases of fly vector-borne disease from around the market. The occurrence of fly vector-borne disease was affected by several aspects as personal and environmental hygiene and environmental sanitation. The dirty environment turns any kind of pathogens to grow and attract fly. The average flight distance of some flies was about 6-9 km from the breeding place$^5$. The population in that area has a high risk of infecting fly vector-borne diseases because bacteria can contaminate the foods and groceries. To keep the cleanliness of foodstuff, they needed to wash them with detergent to reduce the risk of pathogens such as E. coli, Shigella sp., Salmonella sp, to grow, which can be transmitted by the fly. The population who have a good hygiene practice would be prevented from the diseases. Furthermore, the individual with vulnerable conditions and had poor hygiene would be at risk of diseases.

The bacteria found on the flies around the landfill were Escherichia coli, Salmonella spp., Shigella sp. and Vibrio Cholera bacteria, but no parasites. This result was in line with the previous study by Yunita$^{18}$, which has found the Salmonella sp, Providencia, Escherichia and Vibrio in the fly body around the Sukawintan landfill. The typhoid disease occurs due to Salmonella sp infection in the intestinal tract$^{18}$. Salmonella sp in the landfill’s flies was suspected because of the stack of organic and inorganic trash that produced leachate, which can be a suitable medium for the microorganism such as bacteria and parasite to grow. A previous study by Yunita$^{18}$ has found fecal coliform bacteria such as Salmonella sp., Vibrio comma and Shigella in leachate. The pungent smell of leachate attracted flies to come close because they like to pungent smell and dirty place$^{5}$. The fly, which alighted in leachate or waste in landfills, directly carried pathogen bacteria on their bodies. The flies could fly up to 6-9 km$^{12}$. The long flight distance of fly enabled them from the landfill to fly and alight in residential areas around the landfill. The fly which carried pathogen might contaminate food and water, which further can cause diseases such as typhoid fever if consumed by human.

The statistical analysis showed no significant correlation between bacteria and parasites patterns and the prevalence of fly vector-borne disease at the landfill.
The reported vector-borne disease cases from the health care centers around the landfill in specific periods showed that the population around this landfill was avoided from dysentery and cholera. The occurrence of the disease is affected by the interaction between host, agent and environment. Cholera is caused by *Vibrio cholerae*, which is transmitted through contaminated foods and drinks by the fly as a vector. However, the dead *Vibrio cholerae* can not infect and cause disease on humans. However, the bacteria live at an optimum temperature of 18-37°C(10). *Vibrio cholerae* was assumed to be dead before it reached the host, so it would not cause disease around the landfill area. The other presumption was hygiene practice that has been implemented by the population around the landfill. The hygiene practice and healthy life behavior could prevent the individual from many kinds of infectious and transmissible diseases like diarrhea, dysentery, cholera(8).

This research also detected *Shigella sp.* from the landfill sample, but there was no dysentery case reported. The dysentery is an infectious disease caused by *Shigella sp*(4), which can be transmitted by contaminated food and water(16). When the *Shigella sp.* reaches the human digestive tract, the bacteria grow within colon epithelial cells, infect colonic mucosa and spread laterally into the surrounding cells. The infection occurs with a broad range of symptoms from asymptomatic, mild symptoms like watery diarrhea to severe symptoms like stomach cramps, nausea and vomiting, fever, anorexia and bloody feces with mucus(17). Dysentery usually occurred in a dirty environment and poor sanitation area. The residential areas around the landfill have enough distance and space among houses, reducing the risk of fly vector-borne disease transmission in the population. It was assumed that *Shigella sp.* bacteria, which transmitted by a fly vector, did not reach the host. Thus, the population around the landfill was avoided from dysentery.

According to Isma'il(9), the mechanism of disease transmission occurs in several ways, i.e., the way the agent leaves the reservoir, the transmission route to reach host and the port de entry to the host. The fly vector carried pathogen (agent) after leaving the location (reservoir) and went to the residential area would be the risk to cause disease. However, as long as the pathogen carried by fly did not reach to the host or get into the human body, the interaction of disease would not exist. The prevention of infection due to bacteria could be exerted by improving personal hygiene and maintenance of clean food and drink without contamination of pathogens carried by the fly(14). The vector control was also an aspect that was put into a serious concern to prevent the occurrence and transmission of fly vector-borne disease(2).

**Conclusion**

This research found three patterns of bacteria around the market and the landfill in Jember District during November–December 2019, i.e., *Escherichia coli*, *Salmonella sp.*, and *Shigella sp.* The most prevalent cases around the location were diarrhea and typhoid. There was a correlation between the bacterial pattern on the fly and the fly vector-borne disease. The fly was the potential mechanical vector for several vector-borne diseases. We suggested collaborating with the local government or healthcare service with aimed to plan the fly vector control program and fly vector-borne disease prevention, particularly in the area with a high prevalence of the fly vector-borne disease.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** This research has undergone ethical test in ethics commission of health research of Faculty of Dentistry, University of Jember in this following registration number 632/UN25.8/KEPK/DL/2019.

**References**


Effect of Malaria Parasite on Haematological Parameters: 
An Institutional Experience

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Pinki Pandey2, Savita Agarwal1, Jasvinder Singh3

1Associate Professor, Department of Pathology, 2Professor and Head, Department of Pathology, 
3Post Graduate 2nd Year, Department of Pathology, Uttar Pradesh University of Medical Sciences, Saifai, Etawah

Abstract

Objectives: Hematological changes are among the most common complications encountered in malaria. This study analyzes and statistically evaluates the hematological changes as a diagnostic test for malaria in patient with acute febrile illness.

Method: Hundred samples were diagnosed positive by the Leishman’s stained thick blood film. The data were collected from the central lab, Uttar Pradesh University of Medical Sciences, Saifai, Etawah during May 2017 to August, 2019. Laboratory records of people suspected with malaria infection such as fever other signs and symptoms as medical doctor recommended were reviewed.

Results: The finding showed that 100 patients were diagnosed to have malaria by positive smear report by microscopy. Of these were 4 caused by P. falciparum, whereas 96 were caused by P. vivax. No patient with co-infection of P. falciparum and P. vivax were found. The following parameters were significantly lower in malaria-infected patients; red blood cells (RBCs) count, hemoglobin (Hb), platelets count, white blood cells (WBCs) counts, neutrophil, monocyte, lymphocyte and eosinophil counts, while Mean corpuscular volume, Mean corpuscular hemoglobin, Mean corpuscular hemoglobin concentration, neutrophil-lymphocyte ratio (NLR) and monocyte-lymphocyte ratio (MLR) were higher in comparison to non-malaria infected patients. Thrombocytopenia was present in 91% of malaria infected patients.

Conclusion: Patients infected with malaria exhibited important changes in most of hematological parameters with low hemoglobin, platelets, WBCs and lymphocyte counts being the most important predictors of malaria infection.

Keywords: Malaria, hematological parameters, anemia, thrombocytopenia.

Introduction

Since malaria parasites are able to attach to receptors on the red blood cell surfaces, it is expected that malaria parasite have effect on haematological parameters. Changes in blood cell parameters are already a well known feature of malarial infections. Malaria is a major cause of death in the tropical area of the world. Two hundred and nineteen million cases were reported worldwide in 2010[1]. Haematological changes are some of the most common complications in malaria and they play a major role in malaria pathogenesis. These changes involve the major cell types such RBC’S, leucocytes and thrombocytes[2-8]. Malaria infected patients tend to have significantly lower platelets, TLCs, RBCs and Hb level[2-4,6-8].

Fever and other signs and symptoms are known to be sensitive measures of malaria infection but they lack
specificity an positive values especially in areas where malaria is less prevalent \cite{3,9} and it may be difficult to distinguish the signs and symptoms of diseases from other viral or bacterial infections \cite{10}. Typically, microscopic slide examination of peripheral blood remains the most widely used test and is the gold standard for detecting malaria infection \cite{11}.

**Aim:** The objective of this study was to demonstrate the impact of plasmodium *falciparum* and plasmodium *vivax* infections as well as different parasite on blood cell parameters. The haematological parameters (Red blood cells, Leukocytes, Platelets, Haemoglobin level (Hb), Mean corpuscular volume (MCV), Mean corpuscular Haemoglobin (MCH), differential leucocyte count, lymphocyte-neutrophil ratio and monocyte-lymphocyte ratio of patients infected with malaria were investigated.

**Materials and Method**

Hundred samples were diagnosed positive by the Leishman’s stained thick blood film. The data were collected from the central lab, UPUMS, Saifai during May to August, 2017-2019. Laboratory records of people suspected with malaria infection such as fever other signs and symptoms as medical doctor recommended were reviewed.

About 2ml of whole blood was collected from patients via the anticubital vein with sterile syringes and needles, after disinfecting the puncture site with methylated spirit. Few drops of the blood from the syringe were used to make smears (both thick and thin on two different slides respectively) for the diagnosis of malaria parasites and differential white blood cell count. The Leishman staining method was used to stain the thick blood film and the thin film after it was fixed in absolute methanol for two minutes.

The slides were examined microscopically to confirm malaria parasitemia. The rest of the blood sample was emptied into ethylene diamine tetra acetic acid (EDTA) containing 4mg of the K2 EDTA salt. The sample container was inverted several times to ensure proper mixing of the anticoagulant and the blood, for determination of the complete blood count. Blood counts were performed using Sysmex XT-1800i.

The Analyzer provided data on WBCs, RBCs, Hb level, platelet count, MCV, MCH, RDW and five other differentials.

**Result**

The finding showed that 100 patients were diagnosed to have malaria by positive smear report by microscopy. Of these were 4 were caused by *P.falciparum*, whereas 96 were caused by *P.vivax*. No patient with co-infection of *P.falciparum* and *P.vivax* were found, maximum number of cases were seen in the 20-40 years age group. A leishman stained peripheral smear shows many red cells infected with trophozoites [Figure 1(i)], Schizonts and ring forms of *P.Vivax* [figure 1(ii) & 1(iii)]. Higher degree of parasitemia and RBC infected with *P. Falciparum* were seen [figure 2(i) & 2(ii)].
Mean values of RBC’s, WBC, Platelets and all absolute leucocyte components were significantly lower in patients with falciparum malaria compared to those with Vivax malaria and non- Malaria infected groups. Conversely, mean values of MCV, MCH, NL ratio and ML ratio were significantly higher in falciparum malaria than those with vivax malaria and non- malaria infected groups. A mean value of Hb was lower in patients with falciparum malaria than those with vivax and non-malaria infected groups.

**Leukocyte, RBC and Platelet Counts of Patients with P.falciparum and P.vivax:** Leukocyte counts were not significantly different in patients with P.falciparum malaria compared to those with P.vivax infection, for differential leukocyte counts neutrophil count was significantly higher in patients with P.falciparum compared to those with P.vivax infection. For RBC parameters, RBC count was significantly lower in patients with P.falciparum compared to those with P.vivax infection. In addition, other RBC parameters including MCV and MCH were significantly higher in patients with P.falciparum compared to those with P.vivax infection. Platelet count was significantly lower in patients with P.falciparum compared to those with P.vivax.
Table 1: Hematological values in study population

<table>
<thead>
<tr>
<th>Parameters</th>
<th>With Malaria Mean</th>
<th>Non-Malaria Mean (reference range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemoglobin (g/dl)</td>
<td>11.1</td>
<td>12.8 (13-18)</td>
</tr>
<tr>
<td>Total leukocyte count (TLC) (10^3/cumm)</td>
<td>4.1</td>
<td>8.2 (4-11)</td>
</tr>
<tr>
<td>Differential Leukocyte Count (DLC)(%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neutrophil</td>
<td>68</td>
<td>62 (40-75)</td>
</tr>
<tr>
<td>Lymphocyte</td>
<td>22.4</td>
<td>33 (20-40)</td>
</tr>
<tr>
<td>Monocyte</td>
<td>6.7</td>
<td>5.2 (2-8)</td>
</tr>
<tr>
<td>Neutrophil-lymphocyte ratio</td>
<td>3.03</td>
<td>2.1 (1.2-3.8)</td>
</tr>
<tr>
<td>Monocyte-lymphocyte ratio</td>
<td>0.3</td>
<td>0.24 (0.17-0.34)</td>
</tr>
<tr>
<td>RBC Count (million/cumm)</td>
<td>3.76</td>
<td>4.42 (4.2-6.5)</td>
</tr>
<tr>
<td>Hematocrit (PCV)(%)</td>
<td>34.2</td>
<td>43.8 (40-54)</td>
</tr>
<tr>
<td>Red Cell Indices</td>
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<tr>
<td>MCV (fl)</td>
<td>94.7</td>
<td>86.2 (82-98)</td>
</tr>
<tr>
<td>MCH (Pg)</td>
<td>33.9</td>
<td>29.6 (27-33)</td>
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<tr>
<td>Platelet count (10^3/cumm)</td>
<td>78.6</td>
<td>172 (150-400)</td>
</tr>
<tr>
<td>RDW%</td>
<td>16.4</td>
<td>13.8 (12-15)</td>
</tr>
</tbody>
</table>

Discussion

This study confirms that haematological abnormalities in malaria infection are common. The findings in this study showed that during malarial infection there were peripheral blood changes such as anaemia, leucopenia and thrombocytopenia. Leucopenia was frequently seen in the malaria infected patients which was confirmed by other studies that have demonstrated leucopenia\[6,11\] and contrast with other study that had demonstrate leucocytosis\[3\].

Anaemia is one of the most common complications in malaria infection especially in younger children and pregnant women\[12\]. The pathogenesis of anemia during malaria infection is not clearly understood. However it thought to result from the parasite’s primary target on the red blood cell resulting in RBCs destruction, accelerated removal of both parasitized and non-parasitized\[13\], bone marrow dysfunction\[14\] and the level of parasitemia. This study reported a significant reduction of haemoglobin and RBC count whereas MCV, MCH level in patients infected with malaria were higher.

In addition to anemia, a reduction of platelet is another one of the well-known haematological changes observed in patients with malaria. In this study platelet count were significantly reduced in malaria infected patients. Thrombocytopenia occurred in 91% of malaria infected patients. These observations may imply that thrombocytopenia may be a marker of plasmodium infection, patients with thrombocytopenia were also likely to have anemia.

Thrombocytopenia seem to occur through peripheral destruction\[15\], excessive removal of platelet by spleen pooling\[16,17\] as well as platelet consumption by the process of disseminated intravascular coagulopathy (DIC)\[18\]. Immune mediated destruction of circulating platelets has been postulated as a cause of thrombopenia seen in malaria infection. Platelets have also been shown to mediate clumping of P.falciparum infected erythrocyte\[19\]. This could lead to pseudo thrombopenia, malaria infected patients have elevated levels of specific immunoglobulin G(IgG) in the blood which binds to platelet-bound malaria antigens possibly leading to accelerated destruction of platelets\[20\]. Platelet aggregation which is the platelet clumps are falsely counted as single platelets by the analyzer thus causing pseudo-thrombocytopenia\[21\]. Additionally during malaria infection, endothelial activation was activated.
and may contribute to loss of barrier function of the endothelium and organ dysfunction. This process may use platelets and their released proteins as an important regulator of endothelial permeability resulting in thrombocytopenia.\textsuperscript{19}

**Conclusion**

This study can concludes that patients infected with different malarial parasites exhibit important changes and differences in many haematological parameters. The most commonly changed parameters were platelet count, Hb, RBC, MCV, MCH, WBC, neutrophil and lymphocyte counts. Haematological investigation is relatively inexpensive and less technically sophisticated way for malaria parasite detection.

The present study has demonstrated that the haematological parameters are reliable and competent measures to diagnose severity of malaria infection, even at the early stages.

**Ethical Clearance:** Taken from ethical committee.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**

17. Skudowitz RB, Katz J, Lurie A, Levin J, Metz J.


Biofilm Bacteria and Cholesteatoma on Chronic Suppurative Otitis Media

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Abstract

Background: Chronic suppurative otitis media (CSOM) possibility to cause morbidity and mortality. Germ infections were a major factor in the long-standing inflammation of CSOM. Cholesteatoma is an epithelial cyst that containing keratin desquamation. The cholesteatoma present in CSOM patients is a kind of acquisita with several theories that have been believed to be the basis of its formation.

Objective: To explain the correlation between bacterial biofilms and cholesteatoma in CSOM.

Method: We performed the prospective collection of tissue during mastoidectomy surgery from CSOM patient. The tissue samples divided into two groups, cholesteatoma and non-cholesteatoma. All tissues group processed for scanning electron microscopy (SEM) analysis. The SEM results will be categorized into positive and negative bacterial biofilms.

Result: Statistical analysis using logistic regression test had p = 0.027 and risk ratio = 5.55. That means there was a significant correlation between bacterial biofilm and cholesteatoma in CSOM patients (p <0.05). CSOM with cholesteatoma has obtained the risk of bacterial biofilm by 5.55 times compared to CSOM without cholesteatoma.

Conclusion: There was a correlation between bacterial biofilms and cholesteatoma in CSOM patients. A quarter of cholesteatoma showed positive biofilms. CSOM with cholesteatoma has a risk of positive bacterial biofilm.

Keyword: Chronic Suppurative Otitis Media, Cholesteatoma, Bacterial Biofilm.

Introduction

Chronic suppurative otitis media (CSOM) possibility to cause morbidity and mortality that remains a major health problem in worldwide. Morbidity and mortality are caused by cholesteatoma in patients with CSOM. Cholesteatoma in CSOM is a decent media for biofilm bacteria. Biofilm bacteria in cholesteatoma are resistant to antibiotic administration resulting in persistent otorrhea that makes a wider damage and even more severe complications. This makes more complicates of the healing process CSOM patients with cholesteatoma.

The incidence of CSOM in Indonesia (1994-996) was to be about 8.36 million people and the prevalence of CSOM is generally about 3.8%. Research at the Regional General Hospital of Dr. Soetomo in 007-2008 got 61 cases of danger CSOM type that contains cholesteatoma and performed mastoidectomy surgery.

Cholesteatoma is an epithelial cyst that containing...
keratin desquamation. The cholesteatoma present in CSOM patients is a kind of acquisita with several theories that have been believed to be the basis of its formation. Cholesteatoma with infection is a synergy. Cholesteatoma, when formed are will continue to expand and absorb the water, therefore it is moist and invites infection. Debris cholesteatoma is a good culture medium for bacteria.

Germ infection is a major factor in the long-standing inflammation of CSOM. Some bacteria could be attached to the interface area, doing adhesions, aggregate and secrete the polysaccharide exopolymers that will form the glycocalyx matrix into biofilms. Germ infection is a major factor in the long-standing inflammation of CSOM. Some bacteria could be attached to the interface area, doing adhesions, aggregate and secrete the polysaccharide exopolymers that will form the glycocalyx matrix into biofilms. Biofilm bacteria get enough nutrition and have the ability to survive from unfavorable environments such as the body’s natural response. Biofilm bacterial resistance to antibiotic administration is suspected through several mechanisms, namely: failure of penetration, decreased growth rate, metabolic activity and new phenotypic variations. The growth of biofilm bacteria will lead to chronic infection characterized by inflammation and persistent tissue damage. These chronic infections persist despite antibiotic therapy and inflammatory responses and immunity from patients.

Research of biofilm bacteria on cholesteatoma of CSOM patients directly using electron scanning electron microscopy (SEM) that until now has not been done yet in Surabaya. From the above description researchers intend to conduct a study whether there was a correlation between bacterial biofilm and cholesteatoma in patients with CSOM who performed mastoidectomy surgery.

Method

This research was an observational analytic research. This type of analytical research was used to observe the association between biofilm bacteria and cholesteatoma in CSOM. This study used a cross-sectional design that the data collection of biofilm bacteria and cholesteatoma in CSOM was performed simultaneously. The research was conducted in November 2013 to June 2014 at Lotus Room of Surgical Installation Center Dr. Soetomo Teaching Hospital, Surabaya and Technical Service Unit of Electron Microscopy Faculty of Medicine Universitas Airlangga.

The sample (N=33) of this research was CSOM patient which treated in Outpatient unit of otorlaryngology Dr. Soetomo Teaching Hospital that planned a surgery mastoidectomy in invasive blood pressure (IBP) Dr. Soetomo Teaching Hospital. Tools for taking specimens (examination material) during mastoidectomy surgery was curettage & forceps. Biofilm bacteria examination tool was SEM JEOL brand and JSM-T100 Scanning Microscope that made in Japan. The specimen drying apparatus was a Critical Point Drying (CPD) and coating device with Vacuum Evaporator. The required material was 2% Glutaraldehyde fixation solution, buffer phosphate, osmic acid and alcohol of various concentrations. Amyl acetate was a preservative and pure gold as a coating.

During mastoidectomy surgery at Dr. Soetomo Teaching Hospital, the operator takes a pathological tissue in the form of granulation tissue or cholesteatoma then inserted in 2% of glutaraldehyde fixation solution and stored in a cooler temperature of 4°C for less than 2 hours. All the data collected were tabular and statistically, that processed using SPSS (SPSS. Inc. Chicago IL). It was conducted an inferential analysis to determine the correlation between bacterial biofilm and cholesteatoma in CSOM patients. The data obtained was nominal that will be analyzed statistically with logistic regression technique (α = 0.05).

Results

Characteristics of Research Subject: In this study obtained the youngest age was 8 years and the oldest 61 years, while the mean age was 25.78 years (SD = 13.90). The most age group was 11-20 years with 15 (45.45%) patients. The distribution based on sex was obtained by compared them, male: female = 1.1: 1. Most of the age group was the male with 17 (51.50%) patients. Clinical characteristics of CSOM patients in this study was include type of perforation, audiometry results, mastoid photo and complications. Clinical characteristics of patients with CSOM-save type has obtained the result that central perforation (50%) as the most perforated type. Hearing loss conduction type (58.34%) was the most number. Results of the most widely obtained mastoid image were the sclerotic type (75%) (Table 1). Clinical characteristics of patients with CSOM danger-type the total perforation was obtained in 11 (52.38%) patients. Results of mastoid images in the form of cavities were obtained 9(42.86%) patients and four patients not performed mastoid photos but computed tomograph (CT) scan. Fistel retro-auricular was the most common complication (Table 1).
### Table 1. Characteristics of Research Subject

<table>
<thead>
<tr>
<th>Characteristics of Research Subject</th>
<th>Amount</th>
<th>%</th>
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<td><strong>Age (y/o)</strong></td>
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<tr>
<td>&lt;10</td>
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<tr>
<td>11–20</td>
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<td>21–30</td>
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<td>27.27</td>
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<tr>
<td>31–40</td>
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<td>6.06</td>
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<tr>
<td>&gt;40</td>
<td>5</td>
<td>15.16</td>
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<tr>
<td>Female</td>
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<td>48.50</td>
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<td><strong>Type of perforation</strong></td>
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<td>Sclerotic</td>
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<td>Fistel retroaurikula</td>
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</table>

Table 2. Types of mastoidectomy surgery & pathological tissue

<table>
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<th>Type of mastoidectomy surgery</th>
<th>Tissue types</th>
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<td></td>
<td>Cholesteatoma</td>
<td>Non-cholesteatoma</td>
</tr>
<tr>
<td>Canal wall down</td>
<td>16 (48.48%)</td>
<td>5 (15.16%)</td>
</tr>
<tr>
<td>Canal wall up</td>
<td>0</td>
<td>12 (36.36%)</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>17</td>
</tr>
</tbody>
</table>

Table 3. Biofilm bacteria examination results from cholesteatoma and non-cholesteatoma tissue in patients with CSOM

<table>
<thead>
<tr>
<th>Tissue types</th>
<th>Bacterial Biofilm</th>
<th>Total</th>
<th>Regression</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>(+)</td>
<td>(-)</td>
<td>Logistic</td>
</tr>
<tr>
<td>Cholesteatoma</td>
<td>12 (75.0%)</td>
<td>4 (25.0%)</td>
<td>p = 0.027</td>
</tr>
<tr>
<td>Non-cholesteatoma</td>
<td>6 (35.3%)</td>
<td>11 (64.7%)</td>
<td>rr = 5.55</td>
</tr>
<tr>
<td>Total</td>
<td>18 (54.5%)</td>
<td>15 (45.5%)</td>
<td></td>
</tr>
</tbody>
</table>

The types of canal wall down mastoidectomy surgery was performed on 21 (63.64%) patients and mastoidectomy surgery canal wall up performed on 12 (36.36%) patients. Non-cholesteatoma tissue (granulation) was obtained in 17 (51.52%) patients and total cholesteatoma tissue was obtained in 16 (48.48%) patients (Table 2). The result of examination of 33 operational tissues was obtained biofilm (+) on 18 (54.54%) tissue and biofilm (-) at 15 (45.46%) network (Table 3).

Correlation Results of Bacterial Biofilm Analysis and Cholesteatoma in CSOM: The results of bacterial biofilm examination on cholesteatoma and non-cholesteatoma tissue. The examination was performed on 33 tissue mastoidectomy that resulting 16 cholesteatoma tissue and 17 non-cholesteatoma tissues. The results of the cholesteatoma tissue examination were obtained by biofilm bacteria (+) by 12 (75%) tissues and bacteria biofilm (-) by 4 (25%) tissue. The results of non-cholesteatoma tissue examination were obtained 6 (35.35%) biofilm bacteria (tissue) and biofilm bacteria (-) of 11 (67.9%) tissues. The statistical test with logistic regression was obtained p = 0.027 and risk ratio = 5.55. It means that there was a correlation between bacterial biofilm and cholesteatoma and without cholesteatoma with bacteria biofilm on the mastoid mucosa. The study also showed higher biofilm bacteria incidence in CSOM with cholesteatoma than CSOM without cholesteatoma. The difference between the two groups of CSOM on the presence of biofilm bacteria was statistically significant.

The results of this study support the theory that biofilm bacteria that have an important role in the aggressiveness of cholesteatoma in CSOM. Biofilm bacteria were obtained more in the cholesteatoma group than in the group without cholesteatoma with a risk ratio value of 5.55. This suggests that cholesteatoma in CSOM was a risk factor for the formation of biofilm bacteria.

The results of this study obtained bacteria biofilm (-) on 4 (25%) tissue cholesteatoma. Based on previous research bacteria biofilm is often found in cholesteatoma and there was a statistically significant relationship, however, biofilm bacteria was not a typical structure in cholesteatoma. Other causes of bacteria were not obtained in the form of biofilm because bacteria separate themselves from colonies into planktonic forms. This possibility occurs in mature biofilms and favorable environmental conditions.

This research has obtained a bacteria biofilm (+) on 6 (35.3%) of non-cholesteatoma tissue. This result was not a new discovery because it was also found in previous studies with a percentage of 14% - 54.5%. This due to the humid and warm conditions in the middle...
ear, ear canal and mastoid cavity in CSOM. CSOM without active-phase cholesteatoma was a good medium for bacteria to attach to the interface area. The type of bacteria that infects could also affect the formation of biofilms. Although the number was small its needed to be watched by otolaryngology specialists.

The characteristics of age were in accordance with WHO (2004) data which states that the prevalence of CSOM based on surveys in some countries that obtained in many school-age children. The incidence of CSOM with cholesteatoma in the United States of children aged 10-19 was found in 9.2 cases in 100,000 population. Similarly, in Israel, there was the incidence of CSOM with cholesteatoma in children aged 1-15 years by 39 cases in every 100,000 population.

Central perforation was including the safe type of CSOM because it is present a pars tensa and all edges of the perforation still have the rest of the tympanic membrane. Group of dangerous CSOM types are 3 patients who do not do audiometric examination because of patients with intracranial complications that do not meet the requirements of audiometric examination. Hearing loss in this study was similar to some previous studies. Rambe (2002) reported a type of hearing loss from 94 ears of CSOM patients who were conductive deafness was 75 (79.8%) of the ear, deafness was 16 (17%) ear and nerve deaf was 3 (3.2%) ear.

Results of the mastoid photo on most dangerous-type of CSOM was the form of a cavity. The shape of the cavity in the mastoid photo was due to the process of bone destruction as a result of the interaction between cholesteatoma and various inflammatory mediators. The results of radiological evaluation of this study were in accordance with previous research in patients with dangerous-type of CSOM that has obtained the description of destruction by 51 patients, sclerotic in 8 patients, while 9 patients performed CT scan. Fistel retroauricular were almost always due to cholesteatomas that not adequately treated.

The number of complications in this study was more than the research in the same place that shows patients of dangerous-type of CSOM by 39% that experienced complications. The study reported a cerebral abscess as the highest number of 28% followed by fistel retroauricular and subperiosteal abscess respectively 24%. There was no definite factor to explain the occurrence of the different complications experienced by each patient. However, this possibility due to the immune system between different individuals, the delay that came to the doctor, inadequate therapy and the possibility of genetic involvement.

Operation mastoidectomy canal wall down was breaking down meatus acusticus externus (MAE) posterior wall that separates the tympanic cavity with the mastoid cavity. Mastoidectomy operation of canal wall up trying to maintain MAE posterior wall. This complication might be due to the role of inflammatory mediators that could stimulate proteolytic enzymes resulting in bone destruction around granulation. In addition, complications could occur hematogen.

Cholesteatoma that associated with CSOM was a type of acquisition. Cholesteatoma causes erosion of the affected bone through the effects of suppression by keratin debris accumulation as well as the mediation of osteoclast-mediated enzyme-mediated by inflammatory mediators. Bone resorption possibility causes the destruction of the mastoid trabeculae, oleic erosion, labyrinth fistula, Nervus VII (N VII) exposure, duramater and lateral sinuses.

In this study, the tissue with a positive biofilm found the form of coccus bacteria clustered and surrounded by the formation of amorphous materials in the form of glycocalyx. While on the network with negative biofilm found the formation of bacteria coccus but not clustered or shaped sesil and not glycocalyx formation. This study was in accordance with previous studies conducted on the middle ear tissue of CSOM patients performed tympanomastoid surgery.

Conclusion

There was a correlation between bacteria biofilm and cholesteatoma in patients with CSOM. A quarter of cholesteatoma showed positive biofilms. Also, cholesteatoma was a risk factor for the formation of biofilm bacteria.

Ethical Clearance: This research involves participants in the process using a questionnaire that was accordant with the ethical research principle based on the regulation of research ethic regulation. The present study was carried out in accordance with the research principles. This study implemented the basic principle ethics of respect, beneficence, non-maleficence and justice.
Conflict of Interest: The authors have not found any conflict of interest related to this research so far.

Source of Funding: All of the cost and fees related with this research are paid by the authors only with no sponsorship nor external funds.

References

Impact of Health Care Sector on Indian Economic Growth and Challenges: A Socio-Legal Analysis

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Abstract

A large quantity of India’s population is reduced to destitution because of high coverage health-care expenses and also suffering from antagonistic consequences of poor health care services. India has accomplished several gains in the field of Health since the new millennium, such as, life expectancy at birth has increased, the infant mortality and maternal mortality ratio has fell down and the spread of contagious diseases such as HIV/AIDS has been controlled etc. Again WHO, recently officially declared India free from maternal and neonatal tetanus and also polio free. But at the same time, among the five BRICS Nations, namely (Russia, Brazil, South Africa, China and India), India is considered as the poorest performer on the health indicators. India has failed to sufficiently protect its citizens against poor quality of health care as well as financial risks associated with health expenditure.

Health Care Industries of a Country can play crucial roles not only in providing quality care and improving access to medicines for the citizens, but also in developing economic growth of the Country. Again, as it is universally accepted that Health is magnificent and efficacious investment for the economic growth of a Nation, this paper will analyze several major challenges that India need to be addressed, most notably the poor and ineffective regulation of the country, the rapid growth of commercialization of health care services, inadequate public expenditure along with very low level of public expenditure. Here the approach of Judiciary towards the various challenges surrounding the health care services in India will also be discussed.

Keywords: Health, Drugs, rules & regulations, Public Expenditure, Judicial approach

Introduction

The Union Government of India has reported numerous strategy activities, for example, The National Health Policy, 2017 (NHP, 2017) seeks to reach everyone in a comprehensive integrated way to move towards wellness. It aims at achieving universal health coverage and delivering quality health care services to all at affordable cost. India has recorded a few gains in human services part since the new thousand years. For instance, life expectancy at birth has ascended from 62.5 years (in 2000) to 66 years in 2013²; maternal death rate tumbled to 167 for each 100000 livebirths from 301 for every 100000 livebirths in the middle of 2001 and 2013³; the spread of HIV/AIDS has been controlled. WHO authoritatively pronounced India polio free in 2014 and in 2015 announced India free of maternal and neonatal tetanus.

Be that as it may, then again, because of various instances of hardships in health care administrations, individuals in India are confronting challenges for example catastrophe of sterilization death (Chhattisgarh),
incurred visual deficiency because of cataract operation (Punjab), demise of 100 people groups from utilization of illegal alcohol (Mumbai), expanding number of dengue cases all through the nation etc.4,5 India represents 27% of all the neonatal death and 21% of all the child deaths (younger than 5 years) in the world.6 Furthermore, over 6% of ladies are seriously undernourished which is among the most astounding in low-income and middle-income countries.7 The normal age of an individual having their first heart attack is 50 years, in any event 10 years sooner than in developed countries8. Among the five BRICS Nations, to be specific (Russia, Brazil, South Africa, China and India), India is considered as the poorest performer on health indicator.9 Despite a higher salary for every head and two decades of supported monetary development, the nation has fallen behind Bangladesh and Nepal on numerous health indicators. India has neglected to sufficiently ensure its residents against money related dangers related with health care expenses and keep on driving millions into poverty.10

As Health is eminent and effective venture for the financial development of a Nation, there are a few noteworthy difficulties that India should be tended to:

Expanding expenses of medications and unreasonable utilization of innovation: The Indian Pharmaceutical retail market, dissimilar to developed markets like Europe and US, is commanded by brandedgeneric items. At the point when the market is pegged at Rs. 87000 crore every year, the vast majority of the items accessible in the market are branded items sold by the private firms.11 The Government of India spending just around 0.1% of GDP on Government supported medications. So as to enable the client to purchase a less expensive however quality item, the Jan Aushadhi Campaign was propelled by the Government in 2008. The point was to give 361 medications in their exhaustive structure at sensible procedure through Government-run-pharmacies.12 The Government additionally embraces the solution of conventional medications in the public health facilities and furthermore gives the monetary allowance to get fundamental drug that ought to be conveyed at public health facilities free of expense through the National Rural Health Mission.13 The Department of Pharmaceuticals has drafted another pharmaceutical policy in 2012, that proposes to adjust the requirement for value command over prescription. The Drugs (Prices Control) Order of 2013 tries to authorize the costs of imperative prescriptions and controlled mass medications and details to ensure their accessibility in the Country.14 However, legitimate execution of these activities has been conflicting and shifted in State to State. The arrangement to build up in excess of 600 conventional medication drug stores by 2012, however against it just 170 drug stores had been opened in chosen States, of which 99 drug stores were workable, in October 2014. As of late, under Pradhan Mantri Jan Aushadhi Yojana (PMJAY), so as to make quality medications accessible at sensible costs to individuals, it has been chosen to open 3000 Jan Aushadhi Stores the nation over before the finish of 2017.15

Again Indian Medical Device Industry is likewise muddled. About 99% of medical devices in India are not controlled, for example, glucometers, ultrasound machines, endoscopes and ventilators and so on. Under the Medical Devices Rules, 2017, just around 20 devices, (for example, stents, orthopedic inserts, visual focal points and so forth) were covered among around 5000 sorts of medical devices in the market.16

Weak governance, accountability and ineffective regulation of the Country: The composers of the Constitution of India, referenced that among the three lists under Seventh Schedule, ‘health’ enrolled under the State list, with the goal that it is the prime duty of the State Governments to convey appropriate and viable health care services to the general population. Be that as it may, both the Central and State Governments need to work connected at the hip to guarantee effective health care delivery services, as right around 33% of subsidizing for medicinal services originates from the Central Government. One most significant obstruction of the wellbeing administration of our nation is that there is an insufficient combination between different offices inside the Ministry of Health further more, Family Welfare that manage wellbeing administrations, medicinal training, family welfare and different services identified with wellbeing, for example, services the individuals who manage water and sanitation. The Government of India, in the previous 6 years, presented a few new Laws and guidelines to strengthen administration of the social insurance framework in the nation, yet these laws and guidelines are not appropriately executed. For instance, the Clinical Establishment Act, 2010, which accommodates enrollment and guideline of clinical foundations and endorses least measures of offices and administrations to be given by them, has been authorized by just 9 of 29 States and the greater part of the Union Territories of India. The Mental Health Care Bill-2013 includes extraordinary measures to be embraced by
the Government guaranteeing everybody appropriate to get to emotional wellness care and treatment from government run or supported administrations. This progressive enactment was presented in Rajya Sabha and till date sitting tight for enactment. Responding to a Supreme Court of India’s order, The Central Government of India, in 2013, presented new principles for clinical preliminaries to affirm the security when testing new medications. Anyway the extent of these guidelines isn’t clear and explicit. As of late, the amended Medical Devices Rules are required to have sweeping effect on the therapeutic devices industry as this is the primary enactment in India managing medicinal devices. For this, the players engaged with the assembling, bundling, testing, dissemination, deal and import of medicinal gadgets must need to get acquainted with the new guidelines and need to actualize the significant arrangements to their business.

Low Public Expenditure on Health: The total expenditure on health per head in India tumbled from 4.5% of GDP in 2004-2005 to 4.0% of GDP in 2013-2014. However during this equivalent period, genuine open use per head expanded by 40%-a lot of this development was accomplished by 2009-10, with virtual stagnation since 2010-2011. In spite of this expansion, public health expenditure use as an extent of GDP stays low, at simply 1.28%of the Nation’s GDP in 2013-2014.

Public Health Expenditure is added to by both the Central and State Governments, leaving monetarily more fragile States increasingly powerless to low general wellbeing ventures. In spite of the fact that the Twelfth Five Year plan (2012-17) had required a change in perspective and suggested the Central Plan consumption (the Central Government’s help to State Governments for their yearly plans) to increment by about 34% consistently, use by the focal government has expanded by under 1% every year between 2008-09 and 2012-13. Then again, the genuine State consumption on wellbeing, for example in the wake of considering, has expanded by 7% per year. As an outcome, the focal government’s offer in general wellbeing use has stayed under 30% since 2010 and has decreased continuously. Spending discharges from the focal government are frequently said to be founded on the reserve absorptive limits of the states and in light of the fact that many state governments in India neglect to utilize dispensed assets inside the monetary year, genuine discharged spending plans are regularly a lot littler than promised. Although now and then outfitted as purposes behind diminishing budgetary allotments, these low absorptive limits may essentially reflect basic shortcomings in the health services framework that should be tended to with more resources and an alternate way to deal with arrangement and delivery of care.

India’s current foundation is sufficiently not to take into account the developing interest. While the private segment rules human services conveyance the nation over, a greater part of the populace living beneath the destitution line are dismissed in some way or another. They can spend Rs 47 every day in urban zones, Rs 32 every day in provincial territories and these individuals keep on depending on the less financed and less staffed open area for its human services needs, because of which their medicinal services needs remain neglected. Additionally, most of medicinal services experts happen to be focused around urban territories where purchasers have higher paying force, leaving country regions underserved, as the table beneath uncovers. India clings to the world normal in number of doctors, still 74% of India’s specialists take into account 33% of the urban populace, or close to 440 million individuals inside a nation with populace of in excess of a billion.

Judicial Approach towards ‘Health care’ in India: Health is regularly considered as a scientific discipline that requires ability, information and expertise of medication limited to the medicinal experts and researchers however it incorporates financial and political determinants just as characterized by the WHO. Right to health has been regularly constrained to right to health care that has frequently kept to the evenhanded discipline that requires ability, information and expertise of medication limited to the medicinal experts and researchers however it incorporates financial and political determinants just as characterized by the WHO. Right to health has been regularly constrained to right to health care that has frequently kept to the evenhanded discipline that requires ability, information and expertise of medication limited to the medicinal experts and researchers however it incorporates financial and political determinants just as characterized by the WHO. Right to health has been regularly constrained to right to health care that has frequently kept to the evenhanded discipline that requires ability, information and expertise of medication limited to the medicinal experts and researchers however it incorporates financial and political determinants just as characterized by the WHO. Right to health has been regularly constrained to right to health care that has frequently kept to the evenhanded discipline that requires ability, information and expertise of medication limited to the medicinal experts and researchers however it incorporates financial and political determinants just as characterized by the WHO. Right to health has been regularly constrained to right to health care that has frequently kept to the evenhanded discipline that requires ability, information and expertise of medication limited to the medicinal experts and researchers however it incorporates financial and political determinants just as characterized by the WHO. Right to health has been regularly constrained to right to health care that has frequently kept to the evenhanded discipline that requires ability, information and expertise of medication limited to the medicinal experts and researchers however it incorporates financial and political determinants just as characterized by the WHO. Right to health has been regularly constrained to right to health care that has frequently kept to the evenhanded discipline that requires ability, information and expertise of medication limited to the medicinal experts and researchers however it incorporates financial and political determinants just as characterized by the WHO. Right to health has been regularly constrained to right to health care that has frequently kept to the evenhanded discipline that requires ability, information and expertise of medication limited to the medicinal experts and researchers however it incorporates financial and political determinants just as characterized by the WHO. Right to health has been regularly constrained to right to health care that has frequently kept to the evenhanded discipline that requires ability, information and expertise of medication limited to the medicinal experts and researchers however it incorporates financial and political determinants just as characterized by the WHO. Right to health has been regularly constrained to right to health care that has frequently kept to the evenhanded discipline that requires ability, information and expertise of medication limited to the medicinal experts and researchers however it incorporates financial and political determinants just as characterized by the WHO. Right to health has been regularly constrained to right to health care that has frequently kept to the evenhanded discipline that requires ability, information and expertise of medication limited to the medicinal experts and researchers however it incorporates financial and political determinants just as characterized by the WHO. Right to health has been regularly constrained to right to health care that has frequently kept to the evenhanded discipline that requires ability, information and expertise of medication limited to the medicinal experts and researchers however it incorporates financial and political determinants just as characterized by the WHO. Right to health has been regularly constrained to right to health care that has frequently kept to the evenhanded
broaden restorative help for safeguarding human life. Disappointment with respect to an administration emergency clinic to give auspicious medicinal treatment to an individual needing such treatment, results infringing upon his right to life ensured under Article 21.

In State of Punjab v. Slam Lubhaya Bagga, [(1988) 4 se c 117] Hence, the right of a citizen to live under Article 21 throws on commitment on the State. So it is for the State to tie down health to its resident under Article 47. The Court additionally held that the State can neither inclination nor state that it has no commitment to give medicinal facilities. In the event that that were so it would be the infringement of Article 21. No State or nation can have boundless assets to spend on any of its undertakings. That is the reason it just favors extends that seem attainable. Similar remains constant for giving medical facilities to its residents. Arrangement of facilities can’t be boundless. It must be to the degree that funds license. In the event that no scale or rate is fixed, at that point on the off chance that private centers or medical clinics increment their rate to extreme scales, the state would be undoubtedly repay the equivalent. The guideline of fixing of rate and scale under such an approach is legitimized and can’t be held to damage Article 21 or Article 47 of the Constitution.

**Conclusion**

India is a land loaded with open doors for players in the medical device industry. India’s health care services industry is one of the quickest developing parts and in the coming 10 years it is relied upon to reach $275 billion. The nation has likewise turned out to be one of the main goals for top of the line demonstrative administrations with colossal capital venture for cutting edge indicative offices, in this way obliging a more noteworthy extent of populace. In addition, Indian health care consumers have turned out to be increasingly cognizant towards their health care services upkeep. Indian medical services area is tremendously enhanced and is loaded with circumstances in each section which incorporates suppliers, payers and therapeutic innovation. With the expansion in the challenge, organizations are hoping to investigate for the most recent elements and patterns which will have positive effect on their business.24

The Central government ought to contribute towards reinforcing the state health care framework system, give specialized help and money related impetuses, specifically to failing to meet expectations states and boost conspires that are adaptable in their application to oblige the extraordinary varieties between states. In the meantime, the states must take advantage of the expanded portion of expense incomes and work towards expanding the general wellbeing consumption. Networks must be effectively enabled to connect with this extreme vision of medicinal services. Conveying on its guarantee of guaranteeing a healthy India ought to be the highest need of the Indian Government. We trust that, when India achieves the achievement of 75 years of autonomy in 2022, no Indian ought to be denied their fundamental right to great quality health care services because of lack of administrations or facilities and no Indian should confront impoverishment because of health care.

**Conflict of Interest:** Nill

**Source of Funding:** Self

**Ethical Clearance:** NA

**Reference**

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Effect of Trunk Extensor Muscle Fatigue on Postural Stability in Women Undergone Lower Segment Cesarean Section

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Abstract

Background: Cesarean delivery involves thorough disruption of the anterior abdominal wall and is related with greater reports of postpartum pain and slower more painful recovery than vaginal birth. An increase in the inter-recti distance puts postural stability in hazard. It also weakens the abdominal muscles and influence their functions. This can result in an altered trunk mechanics, impaired pelvic stability and postural change, that leaves the lumbar spine and pelvis more susceptible to injury. Low endurance of back and hip muscles has been reported in women after delivery which can result into pelvic girdle pain and lumbar pain. There is lack of research on this topic, indeed this made us to study the effect of trunk extensor muscle fatigue on postural stability in women undergone lower segment cesarean section.

Objectives: To find the effect of trunk extensor muscle fatigue on postural stability in women undergone lower segment cesarean section.

Method: In this observational study, 37 women undergone cesarean section in age group 22 to 35 years were included. One- Leg Standing Balance Test and Functional Reach Test were the major outcome measures to assess postural stability in three conditions: No fatigue, Fatigue and Recovery Condition. Borg 6-20 scale was used to check the exertion level after inducing fatigue in women. Later, data was collected and analysis was done.

Result: Both One- Leg Standing Balance Test and Functional Reach Test showed a decrease from No fatigue condition to Fatigue condition. The results indicate that postural stability was significantly reduced in the Fatigue condition as compared to the No fatigue condition.

Conclusion: Trunk extensor muscle fatigue significantly reduces the postural stability in women undergone lower segment cesarean section.

Keywords: Cesarean Section, Postural stability, Muscle fatigue, One-leg standing balance test, Functional reach test.

Introduction

Postural control is a complicated task which requires the integration of visual, vestibular and somatosensory inputs from all over the body to determine the position and motion of the body in pace and also the ability to generate forces to control body position¹.

Muscle fatigue is an acute and activity- induced decline in the muscle force or muscle power². Muscle
fatigue is an important condition which comprises of sensorimotor integration and hence, postural control. Postural muscle fatigue such as trunk extensors may occur in many labour conditions demanding high tension in the muscle group. Such tension represents an important accommodating factor of the spinal alignment and stability produced lumbar discomfort or pain.

As there is an occurrence of changes in a pregnant women, static stability may get affected due to gestational weight gain and its asymmetrical distribution in the anterior abdominal region, adaptive postural changes necessary for the antero posterior center of gravity (COG) location readjustment, as well as the increased joint laxity, also there is a change in the transient stability in the postpartum period due to increased connective tissue laxity and altered posture. Along with the pregnant women, postpartum women’s postural stability may also get affected due to inadequate sleep and sleep deprivation. There are many other factors that may affect the abdominal muscle function after pregnancy, including the mode of delivery and physical activity levels. Cesarean delivery involves thorough disruption of the anterior abdominal wall and is related with greater reports of postpartum pain and slowers more painful recovery than vaginal birth.

There are several physiological processes occurring during pregnancy that has an impact on the mother’s musculoskeletal system. There is a substantial stretch of the abdominal muscles and common occurrence of increase in the inter-recti distance. Throughout the mother’s body hormones act on connective tissue, which result in joint laxity, particularly in pelvis. There is an increase in the importance and role of muscular stabilization, which is provided by the core muscles including, abdominal muscles.

After pregnancy many women experience an increase in the inter-recti abdominal muscle distance as a result of stretching and thinning of the linea alba. A widening of >2.7 cm at the level of umbilicus is considered as a pathological diastasis of therectus abdominis muscle (DRAM). Hormonal elastic changes of the connective tissue, mechanical stresses placed on the abdominal wall by the growing fetus and the displacement of abdominal organs can lead to occurrence of DRAM. It is very common and it can have negative health consequences for women after pregnancy. The abdominal wall plays an important role in maintaining posture, trunk and pelvic stability, respiration, trunk movement and abdominal viscera support. An increase in the inter-recti distance puts this function in hazard. It also weakens the abdominal muscles and influence their functions. This can result in an altered trunk mechanics, impaired pelvic stability and postural change, that leaves the lumbar spine and pelvis more susceptible to injury.

DRAM is quite common and is associated with the risk factors such as multiparity, maternal age and childcare responsibilities. There is an opposing evidence linking DRAM with weight gain and high body mass index (BMI).

Laxity in the supporting tissue is the source of muscle strain during actual birth. During Cesarean delivery, the lower back muscles are used, along with pelvic muscles and abdominals. Low endurance of back and hip muscles has been reported in women after delivery which can result into pelvic girdle pain and lumbar pain. Consequently, this study focuses on how trunk extensor muscle fatigue affects postural stability in postpartum period.

**Material and Methodology**

This study was done to find the effect of trunk extensor muscle fatigue on postural stability in women undergone lower segment cesarean section. The study was carried out in Krishna Physiotherapy Out Patient Department, Karad. An approval of the study was obtained from the institutional ethical committee of Krishna Institute Of Medical Sciences Deemed University. The purpose of the study was explained to the participants and consent form was taken. 37 women who underwent lower segment cesarean section was taken from Karad for study. The inclusioncriterias were those women undergone single Cesarean section 6 months back in age group between 22 to 35 years and those who do not perform core muscle exercise on regular basis. The exclusioncriterias were those women who underwent multiple cesarean section, having any musculoskeletal dysfunction and those having any psychological problem. One- leg Standing Balance Test and Functional Reach Test were the major outcome measures to assess postural stability. Order of testing was One- leg standing balance test followed by Functional reach test under three experimental conditions, No fatigue, Fatigue and Recovery. The dominant leg was first determined by asking the subject to kick a ball placed on the floor in front of her and the ‘kicking limb’ was considered.
as ‘dominant leg’. For One-leg standing balance test, subject was standing barefoot on a firm stable surface on the dominant leg with the other leg raised, arms crossed over the chest. Test was performed under eyes closed condition to avoid vision from interfering with the task of postural control. Time of one-leg standing was recorded in seconds using a stop watch. Test was terminated when the women had used her arms (i.e., uncrossed arms), used the raised foot (moved it towards or away from the standing limb or touched the floor), moved the weight bearing foot to maintain balance (i.e., rotated foot on the ground), or opened eyes. Three trials were given and best of them were taken as the final reading. Functional reach test was performed by the subject standing next to but not touching a wall with dominant arm closer to the wall at 90 degrees of shoulder flexion with a closed fist. Women had selected a comfortable stance with feet shoulder width apart. To keep foot positions and base of support constant, during reassessments in all three conditions, footprints were marked. The subject was asked to reach forward as far as possible without taking a step. The distance between the start and the end position was measured using the third metacarpal as the reference point and was recorded in centimeters. Three trials were given and the average of the three trials was taken as the final reading. To induce fatigue of trunk extensor muscles subject was made to perform dynamic trunk extensions until maximum exhaustion. For this task subject lied prone on a bench with the upper body unsupported in the horizontal plane and the lower limb secured to the bench with straps at the hips, knees and ankles. During the test, arms were held across the chest. The subject was instructed to raise her upper body to a horizontal position with the head and neck in neutral position and then lowering it back down. Time of 40 beeps/min was recorded using digital metronome application to ensure that the subjects perform the extensions at a consistent rate. Women were instructed to perform the extension movement as many times as possible till she was unable to continue due to muscle fatigue. After termination of the task postural stability was assessed immediately (Fatigue condition) using One-leg standing balance test and Functional reach test as described earlier. The subjective exertion level for the fatiguing task was assessed through the Borg 6-20 scale. For recovery of induced trunk extensor muscle fatigue, rest was given in a supported position. Further, recovery time was noted and to observe recovery in postural stability (Recovery condition) One-leg standing balance test and Function reach test was performed again and readings were noted. Women were asked to refrain from any strenuous physical activity for past 48 hours. Then, statistical analysis and interpretation was done for each candidate to find out the effect of trunk extensor muscle fatigue on postural stability in women undergone lower segment cesarean section.

Statistical Analysis:

For sampling size following formula was used

\[ n = \frac{4pq}{L^2} \]

(p = 70%, q = 30% and L = 15%)

\[ 4 \times 70 \times 30/225 = 37 \]

\[ n = 37 \]

Statistical analysis of the recorded data was done by using the software INSTAT App. Unpaired t test was used to determine p value (\(< 0.0001\)), which indicates it is extremely significant. Tukey Kramer Multiple Comparison Test was used to compare postural stability in three conditions: No fatigue, Fatigue and Recovery condition.

Result

Table No 1: Test Results

<table>
<thead>
<tr>
<th>Tests</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>p Value</th>
<th>Interference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>31.43</td>
<td>3.087</td>
<td>&lt; 0.0001</td>
<td>Extremely Significant</td>
</tr>
<tr>
<td>BMI</td>
<td>23.73</td>
<td>4.86</td>
<td>&lt; 0.0001</td>
<td>Extremely significant</td>
</tr>
<tr>
<td>OLST</td>
<td>12.736</td>
<td>2.954</td>
<td>&lt; 0.0001</td>
<td>Extremely Significant</td>
</tr>
<tr>
<td></td>
<td>8.059</td>
<td>2.245</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11.566</td>
<td>3.260</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Participants mean age, BMI were 31.43 years and 23.73 kg/m² respectively. Mean rating of perceived exertion for the fatiguing task was 13.75±2.278 on Borg 6-20 scale. Statistical significance was set at P< 0.0001. Tukey Kramer Multiple Comparison Test was used to compare postural stability in three conditions: No fatigue, Fatigue and Recovery condition. OLST showed a decrease from No fatigue condition (12.736 ± 2.954 seconds) to Fatigue condition (8.059 ± 2.245 seconds). FRT showed a decrease from No Fatigue (36.25 ± 5.52 centimeters) to Fatigue condition (27.16 ±5.28 centimeters). The results indicate that postural stability was significantly reduced in the Fatigue condition as compared to the No fatigue condition.

To determine the recovery period for postural stability, mean value of the consecutive readings for OLST and FRT taken during the recovery condition were compared with the No Fatigue condition. It was observed that mean recovery time for OLST and FRT was 4.65±2.12 minutes. Further analysis showed no significant difference between the recovery time of one-leg standing test and functional reach test (two-tailed P = 0.999).

Discussion

The purpose of the present study was to find out the effect of trunk extensor muscle fatigue on postural stability in women undergone lower segment cesarean section. Trunk extensor muscle fatigue significantly affected postural stability as indicated by reduction in One-leg standing balance test and Functional reach test respectively from No fatigue to Fatigue condition. This result confirms our null hypothesis in accordance with previous reports.

Trunk extensors are mainly postural muscles which are involved in many labour conditions demanding high tension in the muscle group. The erector spinae and multifidus are used to maintain the body posture. Hence, fatigue in these muscles may cause difficulties in maintaining upright posture. The objective of this study was to find out the effect of trunk extensor muscle fatigue on postural stability in women undergone lower segment cesarean section.

In the present study the mean age group was 31.43 years. Although the age group included in this study was in between 22 to 35 years, out of 37 women postural stability of those of age group in between 30 to 35 years was affected. This may be due to following reasons: small sample size, late marriage, late pregnancy. Late marriage could be due to educational factor, self-dependency, cast discrimination, cultural discrimination, etc. Late pregnancy could be due to various reasons such as sedentary lifestyle, dietary factors, stress, etc.23

Out of 37 women, 26 were with normal BMI, 7 were overweight whereas 4 were obese. Participants mean BMI was 23.73 kg/m² respectively. This may be due to the hormonal elastic changes of the connective tissue, mechanical stresses placed on the abdominal wall and the displacement of abdominal organs that can lead to occurrence of diastasis rectus abdominis muscle (DRAM).16 There is an opposing evidence linking DRAM with weight gain and high body mass index (BMI).20

The mean period of LSCS was 7.78 years out of 37 women. This may be due to small sample size, elective cesarean delivery, medical reasons, etc.

Mean recovery time for OLST and FRT was 4.65±2.12 minutes as in Cesarean delivery there is thorough disruption of the anterior abdominal wall10 which causes lack of strength in the abdominal muscles. This results in weakening of the core muscles that ultimately leads to muscle fatigue. Also, it is related with greater reports of postpartum pain and slower more painful recovery than vaginal birth.10 Postural stability may get affected due to gestational weight gain,
increased connective tissue laxity and altered posture in the postpartum period. Consequently, this study focuses on how trunk extensor muscle fatigue affects postural stability in postpartum period.

**Conclusion**

Trunk extensor muscle fatigue significantly reduces the postural stability in women undergone lower segment cesarean section. Postural stability in No Fatigue and Recovery condition was similar as compared to Fatigue condition.

**Conflict Of Interest:** The authors declare that there are no conflicts of interest concerning the content of the present study.

**Source Of Funding:** Self-funded.

**Ethical Clearance:**

**References**

Influence of Dual Task Training in Indoor Versus Outdoor Environment on Physical Function and Social Activity among Elderly

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Abstract

The existential reality of elderly is that their physical efficiency is challenged as per their changes in living environment and degree of socialization. Numerous elements of every task performed unconsciously to intervene dual task (cognitive & motor or motor & motor) and so dual task activity training is essential.

Aim: To find the influence of dual task activity training in indoor versus outdoor environment on physical activity and social activity self-efficacy measure among elderly.

Objectives: a) To study the influence of dual task training in indoor environment on physical function & social activity self-efficacy measures among elderly. b) To study the influence of dual task training in outdoor environment on physical function & social activity self-efficacy measures among elderly. c) To compare the influence of dual task training in indoor & outdoor environment on physical function & social activity self-efficacy measures among elderly.

Material and Method: Group A subjects were treated in indoor (closed) environment and Group B subjects were treated in outdoor (open) environment with 38 subjects under each group. The duration of training intervention in each group is 60 minutes per session of exercise program including warm up & cool about period administered twice per week for 12 weeks duration. The pre-test measures was recorded on the first day at the start of treatment and the post-test measures after 12 weeks duration from the start of intervention for statistical analysis.

Results: The study predicted significant results of outdoor dual task activity with relation to timed 10 meter walk test promoting physical function and motivation to participate in social activities.

Keywords: Indoor Environment, Outdoor Environment, Dual Task activity, Functional Performance.

Introduction

Need of Geriatric Research and Public Health Need: The extent of adaptation towards their lifestyle changes, social participation and environment in which elderly perform their physical activities needs to be understood properly¹. The existential reality is that their efficiency in physical capacity needs are challenged as per their changes in living environment and degree of socialization.

The Nature of Dual Task Activity and Research Need: Numerous elements of tasks unconsciously intervene dual task. The transfer of training effects of daily needs is a challenge and so it needs to be practiced in both indoor and outdoor to prevent incomplete training with regard to fall prevention³.
Environmental Influence on Functional Performance in Elderly: Independent living among elderly comes with the belief when their cop abilities of self-care in the prevailing environment and completing tasks avoiding support.

Environmental Influence on Social Participation on Elderly: Social participation is meant to be a key dimension of healthy successful aging. The elderly needs to manage the distracting factors of environment to achieve the feeling of steadiness to enhance participation in instrumental activities of daily life, which lets an individual to live more independently in the community with good mobility.

Summarized Literature Review: Perfect tracking of the performance of dual task activity and estimating the individual’s progression is the basic requirement of methodology. Several studies are done pertaining to specific activity at indoor and outdoor environment. Older studies are found significant where the elderly enjoy and participate in involvement in physical activities which specifies regarding fear avoidance behavior had positive results. All relevant studies since 2005 had been considered to predict the research gap. There exists lack of studies with relation to environmental influences, with respect to indoor and outdoor training respectively.

Need of The Study: Attention and working memory seems to coincide during any task performance. The processing of information about/on holding two ideas in mind until completion of dual task within a brief period of attention stimulus in a given environmental situation is the normal physiological criteria to be met with. The individual preferences for the elderly and their comfort needs have to be valued during any form into physical activity training.

Material and Method: The research is an interventional study, pre - post study design with a sample size of 76 subjects utilizing random sampling method and the period of study was one Year. Inclusion criteria: All asymptomatic elderly, above the age of 65 years including both genders; retired senior citizens restricted to their residence most of the time; no history of fall for the past 12 months; ability to walk 20m without human assistance; ability to speak/read/communicate. Exclusion criteria: Medically unstable patients and patients with pacemaker; chronic illness & life threatening medical issues; all types of disabilities; uncooperative and psychiatric elderly patients; patients with paralytic limbs, vestibular dysfunction; subjects who are doing part time work, farm work or any other regular work are restricted from the study.

Outcome Measures: The pre - test & post - to test measures includes the following. 1. Timed 10-Meter walk Test 2. Timed Up & Go Test 3. Social Activity Self - Efficacy Measure.

Procedure: Group A subjects were treated in indoor (closed) environment and Group B subjects were treated in outdoor (open) environment with 38 subjects under each group. Intervention in each group is 60 minutes exercise program including warm up & cool about administered twice per week for 12 weeks duration. The pre-test and post-test measures was recorded on the first day at the start of treatment and post 12 weeks duration. The results recorded were considered for statistical analysis using Mean, standard deviation and unpaired t-test to compare two independent groups.

Exercise Procedure: 1. Jacobson’s relaxation: 05 minutes. 2. Free exercises in extremities and spine: 05 minutes. 3. Personal activities (Folding Bed sheet/ counting currency & Dressing self): 10 minutes. 4. Cognitive exercises (Loud reading, Writing/Drawing while listening to music & Brushing teeth with non-dominant hand): 10 minutes. 5. Dual task activity duration: 20 minutes (which includes reading/talking while walking: 05 minutes; follow the light/cues while walking: 05 minutes; obstacle walking: 10 minutes) 6. Recreational activity (catching & throwing ball): 05 minutes. 7. Relax breathing exercises: 05 minutes.

Results

Table No: 1: Comparison of social activity self-efficacy measures: Posttest result measures of indoor versus outdoor dual task activity training.

<table>
<thead>
<tr>
<th>Social activity self-efficacy measure</th>
<th>Indoor (Group A)</th>
<th>Outdoor (Group B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>50.08</td>
<td>44.42</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>9.030</td>
<td>7.354</td>
</tr>
<tr>
<td>p value</td>
<td>0.0037</td>
<td></td>
</tr>
<tr>
<td>t value</td>
<td>2.995</td>
<td></td>
</tr>
</tbody>
</table>

Note: The Post-test result measures of Indoor versus Outdoor Dual task activity training in relation to social activity self-efficacy measures/measured is significant as p value is less than 0.05 (< 0.05).
Table No: 2 Comparison of timed 10 meters walk to test: Posttest result measures of indoor versus outdoor dual task activity training.

<table>
<thead>
<tr>
<th>Physical activity</th>
<th>Timed 10 meter walk test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indoor (Group A)</td>
</tr>
<tr>
<td>Mean</td>
<td>15.39</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>1.621</td>
</tr>
<tr>
<td>p value</td>
<td>0.0151</td>
</tr>
<tr>
<td>t value</td>
<td>2.488</td>
</tr>
</tbody>
</table>

The Post-test result measures of Indoor versus Outdoor Dual task activity training in relation to timed 10 meter walk test is significant as p value is less than 0.05 (< 0.05).

Table No: 3 Comparison of timed up and go to test: Posttest result measures of indoor versus outdoor dual task activity training.

<table>
<thead>
<tr>
<th>Physical activity</th>
<th>Timed Up and Go test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indoor (Group A)</td>
</tr>
<tr>
<td>Mean</td>
<td>13.16</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>1.28</td>
</tr>
<tr>
<td>p value</td>
<td>0.3378</td>
</tr>
<tr>
<td>t value</td>
<td>0.9649</td>
</tr>
</tbody>
</table>

The Post-test result measures of Indoor versus Outdoor Dual task activity training in relation to timed up and go to test is not significant as p value is greater than 0.05 (> 0.05). The statistical values are found significant in dual task activity training in outdoor environment with unpaired-t test for timed 10m walk test and social activity self-efficacy measure since the p value is less than 0.05 (< 0.05). The statistical values are found not significant in dual task activity training in outdoor environment with unpaired-t test for timed up and go test since the p value is greater than 0.05 (> 0.05).

Discussion

To promote worthy independent living, therapeutic interventions in elderly should involve dual task activity stimulating sensory acuity\textsuperscript{10,11}. They should be well trained progressively in sudden stimulus driven activities in different environments for successful dual task activity performance and thereby preventing falls.

The 10 meter walk test has previously been used to describe differences in walking speed across the lifespan demonstrating that speed begins to decline by 50 years of age and continues to decrease to each progressive decade of life. Elderly who spend more time for outdoor environment are said to be physically active, walk longer distance than those who spend more time indoor environment. Thus there will be reduced risk of morbidity specifically, if they walk for longer distance as possible in outdoor environment.

Infrequent performance of outdoor walking has been proved as a marker for frailty and can increase the risk of morbidity & self-care declines to result in social isolation. In this study, the elderly were trained in an outdoor natural environment under supervision without risky additional barriers like sloppy surface, uneven terrain, traffic areas, noisy environment, etc., due to continuation of their participation ensuring safety. Dual task training is a therapeutic approach which has improved outdoor walking skills in elderly.

The results predict that social activity self-efficacy is significant which implies safe participation in physical activities indirectly. The results signify that outdoor environment is preferable to improve interest or pleasure in performing dual task activities. So, it enhances the physical activity participation in elderly. The higher degree of performance and practice of dual task activity training in outdoor environment makes them fitter with control over any environment preventing falls. Till date only few studies has examined the interactive effects of exercise and mood in older cohorts and so further research work is in need to elderly wellness\textsuperscript{12}.

The transformative exercise framework supports rehabilitation to wellness of elderly that emphasizes a linkage between many health professionals. The focus areas are rehabilitation, condition-specific exercise, fitness and lifetime physical activity emphasizing a range of options for promoting safe activities among elderly.

All participants that participated in the outdoor environment training had felt a comfort zone and positive physical ability in walking 10 meters and felt repeating it often. Even though the elderly showed performance variations in each session to a limit, it was found that outdoor environment were suitable for a greater extent. It is usual that elderly individuals modify the walking speed and balance control as per their fall related self-efficacy and fear factors to suit different environmental condition\textsuperscript{8}. Dual task activity training performed in
outdoor environment allows the elderly to engage themselves in challenging situations and adjusting to the environment in completing the task successfully. At the end of 12 weeks protocol it’s found that the performance of timed 10 meters/metered to walk to test has proved significant in outdoor training compared to indoor training which implies the need of preferable training environment to overcome barriers related to fall prevention. Natural environment creates a confidence promoting sensory awareness and cognition as felt by the elderly. In addition the better performance in outdoor environment can be utilized as a cost-effective and interest provoking method of physical activity training in elderly.

There exists clinical evidence that dual task activity training for elderly with mild to moderate form of delirium requires to be trained in simulated environment and outdoors. The invention of park fitness, big outdoor gyms for elderly is expanding with the initiation for promoting wellness for the elderly.

The “Timed up and go test” (TUG) are designed to measure basic mobility function. Limited equipment is required and very cost effective test which is therefore convenient in any form of clinical settings. As the timed up and go to test has many components which need stability, attention, uniform speed of performance, turning and changing positions the elderly found comfortable with performing in a safe indoor environment. It denotes some type of physical activity training is required in indoor environment too. Majority of the elderly have some difficulty in using foot wear comfortably or some minor physiological drop exists which was a considerable factor of non-significant result of relation to timed up and go to test. Early mobility deficit was found among most of the elderly which consistently improved on practice and duration. This has been found as a reason for non-significant results of relation to time up and go to test.

The reduced duration of completing 10 meters walking distance between outdoor environments signifies that the physiological symptom of perceived exertion was lower when compared to participants trained under indoor environment. There is significant evidence and this study provides additional weightage that there is long term functional health benefits of elderly exposed to outdoor environment training regularly. Thus the significant outcome of the study stands as a facilitator for the elderly who resists moving to outdoor environment due to any possible reason for special consideration to gender.

The significant results of self-efficacy in social activity imply that it is a positive predictor for improving physical activity. This will influence the instrumental activities of daily living in a long run promoting outdoor activity. In a nutshell, we can conclude that the dual task training brings back a lost skill.

**Feedback of Subjects:** 1. Easier and interested to perform exercises/participation in progressive physical activity in the absence of therapists. 2. Dual task activity training found to improve communication/improves/improved participation in instrumental activities and reduce fear factor. 3. Able to acknowledge & react to the physical demands as per progression.

**Clinical Implications:** 1. The patient has to recognize that his recovery and functional status is largely the result of his own efforts and utilizing his senses in a relaxed environment. 2. It focuses on the role of physiotherapists in addressing specific physical fitness needs of those at risk of falls.

**Conclusion**

The study predicted significant results of outdoor dual task activity in promoting physical function of timed 10 meter walk test and motivation to participate in social activities. In spite of the performance limits, the participants expressed that the natural feelings of outdoor environment (climate, mild sound, mixed visual stimulus in outdoor) were never experienced as distraction interrupting the training.

**Ethical Issue:** Ethical clearance was taken from institutional ethical committee, KIMSDU, Karad.

**Funding Sources:** Krishna Institute of Medical Sciences Deemed To Be University, Karad.

**Conflict of Interest:** Nil

**Reference**


2. Rimmer J, Lai B. Framing new pathways in


Emotional Intelligence Factors Influencing on Interpersonal Problem of Adults

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Abstract

The present research is an empirical effort made to study how the Emotional Intelligence factors influence on the interpersonal problems of adults. The sample-size is 500 comprising 200 teachers, 150 IT professionals and 150 nurses. The stratified random sampling method is adopted. The age ranges from 22 to 50 (Mean Age = 31.95). The research is executed with non-clinical samples. The tools adopted are: (1) Emotional Intelligence scale⁴ and (2) Inventory of the Interpersonal Problems⁸ (IIP-32). The participants are contacted individually by the researcher and data is obtained with the help of the above mentioned tools. The descriptive statistics and correlation are used for the statistical analyses. Results indicate that the dimensions of interpersonal problems are negatively correlated and it is statistically significant with the dimensions of emotional intelligence at the 0.01 level of significance as well as at the 0.05 level of significance. This finding supports the understanding and the development of effective strategies in psychotherapy.

Keywords: Emotional Intelligence, Interpersonal Problems, Non-clinical sampling, Psychotherapy, Adults.

Introduction

Emotional Intelligence: Emotional intelligence is a set of abilities to identify, understand, use and regulate emotions to promote greater emotional and personal growth¹¹. It is also referred as the appraisal and expression of emotion in the self and others, regulation of emotions in self and others and use of emotions to facilitate performance¹. The past 100 years, the cognitive intelligence (IQ) had been ruling the world. The individuals with high intellectual quotient were considered as smart in settling down with reasonable job, prestige and respect. But for last 40 years, emotional intelligence is taking the lead. The reason is that the problems encountered were not intellectually based, rather emotionally oriented. Hence in recent decades, there has been a growing interest in identifying oneself in emotional health and mental wellbeing.

The emotional intelligence embodies the interpersonal and intrapersonal competencies which is a central to the contemporary conceptualization of emotional intelligence. Gardner (1983) provides a compatible backdrop when he talks about the personal intelligence which includes intrapersonal intelligence and interpersonal intelligence. Intrapersonal competencies represent the abilities with which an individual manages and utilizes his or her own emotional states such as self-regard, emotional self-awareness, self management, assertiveness, independence, self motivation and self-actualization. The individuals with intrapersonal emotional intelligence are aware of their emotions, would express easily their thoughts and emotions and they possess the ability to control themselves¹³. Interpersonal emotional intelligence includes empathy, social responsibility and managing interpersonal relationship. The individuals with

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interpersonal emotional intelligence could understand how others feel, communicate and get along with them. Intrapersonal person understands one’s emotions whereas interpersonal person understands the emotions of others.

**Interpersonal Problems:** The behavioral excesses and inhibitions in interpersonal relationship are defined as the interpersonal problems. It is regarded as a discrepancy between the roles in a social script. For example, when a person ‘A’ wants friendliness, but repeatedly experiences hostility, then the person ‘A’ is having an interpersonal problem which confirms the personal distress and prevents a person from functioning appropriately in social relationship. It occurs periodically and repeatedly in relationships because of specific responses and coping behaviors that result in a dysfunctional interactive style.

Interpersonal Problems are caused by Maladaptive coping strategies that are the unhelpful ways in which people habitually deal with interpersonal stress. The maladaptive coping strategies (schema) perpetuate the existence of interpersonal problems. For example, it may be an adoptive for a child to avoid an angry parent, withdraw from a detached parent, or surrender to a domineering parent. As the result, the child learned to withdraw, cling, attack or to surrender. These responses and behaviors served as adoptive function at some point in life (as a child), they tend to be problematic in adult relationship. When adults get triggered in relationships, they may stumble for a response which gives them temporary relief. Though these coping behaviors would produce short term relief, but in the long run, the very same coping strategies cause interpersonal difficulties. Hence the schemas (cognitive frame of reference being established on past experiences) determine who we are and direct how we live our lives, create the internal monologue which characterizes the thoughts, assumptions and interactions and forms each person’s individual worldview.

**Theoretical framework for Emotional Intelligence and Interpersonal Problems:** Emotional intelligence plays a significant role in the establishment and maintenance of interpersonal relationship. They are negatively associated. The individuals who scored high on the emotional intelligence scale are tend to have more positive and less conflictive relationship with others. The poor insight and difficulties with emotion-based decision-making suggested the possible deficits in the processing and interpretation of social and emotional information that impaired interpersonal relationship. The adults who are low on emotional intelligence, they experience more conflict and poorer relationship quality. From the related studies, it is clear that the variables such as the emotional intelligence and the interpersonal problems influence each other and they are negatively related.

**Significant of the research:** The review of the literature reveals that there is no study done with adult population in an Indian context in particular to the service sector such as teachers, nurses and IT professionals. This fills the research gap. The research would help the reader to understand the issues of emotional intelligence better. Consequentially this study will assist in counselling and psychotherapy towards creating awareness on emotional intelligence and strengthening the interpersonal relationship. As the result, the adults would have lesser interpersonal problems.

**Objectives:**
- To identify the levels of Interpersonal Problems among the respondent
- To identify the level of Emotional Intelligence among the respondent
- To find out the relationship between the responses of the respondent towards the Interpersonal Problems and Emotional Intelligence.

**Hypothesis:** Based on the above stated descriptions about the Interpersonal Problems and the emotional intelligence, the following hypothesis is being framed:

**Ho:** there is no significant relationship between the factors of emotional intelligence and Interpersonal Problems.

**Ha:** there is a significant relationship between the factors of emotional intelligence and Interpersonal Problems.
Method

Descriptive survey method was adopted. 500 samples were selected following the stratified random sampling method, consisting of 172 males and 328 females working as teachers, nurses and Information Technology (IT) professionals. The research was executed with non-clinical samples. The age was ranging from 22 to 50 (Mean Age= 31.95). The participants were contacted individually by the researcher and data was obtained with the help of the selected tools. Before the data collection was made, oral permission was obtained from the correspondent and principles of the concerning schools, healthcare centers and IT managers.

Instruments used:

**Emotional Intelligence Scale (EIS):** The Emotional Intelligence scale is developed and standardized for Indian Milieu. It contains 34 items with five-point rating scales as 5-strongly agree, 4-Agree, 3-uncertain, 2-disagree and 1-strongly disagree. The scale measures the ten dimensions of Emotional Intelligence namely, self-awareness, empathy, self-motivation, emotional stability, managing relations, integrity, self-development, value orientation, commitment and altruistic behavior. It has split-half reliability value of 0.88 and validity with 0.93. This scale is used for individual assessment, research and survey purposes. It does not require the services of highly trained test administrator. Based on this stated reasons, the EIS-scale was selected and used for this research purpose.

**Inventory of the Interpersonal Problems (IIP-32):** The inventory of Interpersonal Problems (IIP-32) is developed and standardized for adult. The scale consists of 32 items with five-point rating scale as 0-not at all, 1-a little bit, 2-moderately, 3-quite a bit and 4-extremely. The scale measures the eight dimensions of interpersonal problems namely domineering/controlling, Vindictive/self-centered, Cold/Distant, Socially inhibited, Non-assertive, Overly accommodating, Self-sacrificing, Intrusive/Needy. The total T-score (70 and above) was used as an indicator of severity of the interpersonal problems. It has the Crobach’s alpha with 0.88. Based on the stated reasons, the IIP-32 scale was selected and used for this research purpose.

**Analysis strategy:** The statistical program IBM SPSS 21 was used for the data analysis. The descriptive statistics were adopted. Karl Pearson’s moment correlation (‘r’) was used towards determining the significance, direction and strength of the relationship between the research variables.

**Result and Discussion**

The primary intension of the research is to find out the relationship between the dimensions of the Emotional intelligence and Interpersonal Problems.

### Table 1: shows the distribution of adults’ scores based on the dimensions of Emotional Intelligence

<table>
<thead>
<tr>
<th>Dimensions of emotional Intelligence</th>
<th>Category</th>
<th>Range</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-awareness</td>
<td>Low</td>
<td>1.00 - 2.99</td>
<td>62</td>
<td>12.4</td>
<td>3.90</td>
<td>.63</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>3.00 - 3.99</td>
<td>239</td>
<td>47.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>4.00 - 5.00</td>
<td>199</td>
<td>39.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Empathy</td>
<td>Low</td>
<td>1.00 - 2.99</td>
<td>51</td>
<td>10.2</td>
<td>3.79</td>
<td>.54</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>3.00 - 3.99</td>
<td>298</td>
<td>59.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>4.00 - 5.00</td>
<td>151</td>
<td>30.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-motivation</td>
<td>Low</td>
<td>1.00 - 2.99</td>
<td>33</td>
<td>6.6</td>
<td>3.94</td>
<td>.51</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>3.00 - 3.99</td>
<td>264</td>
<td>52.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>4.00 - 5.00</td>
<td>203</td>
<td>40.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional stability</td>
<td>Low</td>
<td>1.00 - 2.99</td>
<td>68</td>
<td>13.6</td>
<td>3.79</td>
<td>.57</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>3.00 - 3.99</td>
<td>292</td>
<td>58.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>4.00 - 5.00</td>
<td>140</td>
<td>28</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The table-1 describes the distribution of adults’ scores based on the dimensions of emotional intelligence with their category, range, frequency, percentage, mean and standard deviation. The category is distributed with low, average and high with corresponding level of emotional intelligence. The adults with high score are considered to have high level of intelligence and are likely to have better interpersonal relationship. On the other hand, the adults with low score are considered to have low level of intelligence and are likely to have interpersonal problems.

Regarding the Self-awareness, it is observed that 62 (12.4%) adults obtained the low score between 1.00 - 2.99, 239 (47.8%) adults obtained the average score between 3.00-3.99 and 199 (39.8%) adults obtained the high score between 4.00 -5.00. The mean of self-awareness is 3.90 and the standard deviation is 0.63. This indicates that the level of self-awareness is average. With regard to empathy, it is observed that 51 (10.2%) adults obtained the low score between 1.00 - 2.99, 298 (59.5%) adults obtained the average score between 3.00-3.99 and 151 (30.2%) adults obtained the high score between 4.00 -5.00. The mean of empathy is 3.79 and the standard deviation is 0.54. This indicates that the level of empathy is average. It is also observed that on Self-motivation, 33 (6.6%) adults obtained the low score between 1.00 - 2.99, 264 (52.8%) adults obtained the average score between 3.00-3.99 and 203 (40.6%) adults obtained the high score between 4.00 -5.00. The mean of self-motivation is 3.94 and the standard deviation is 0.51. This indicates that the level of self-motivation is average.

With regard to emotional stability, it is observed that 68 (13.6%) adults obtained the low score between 1.00 - 2.99, 292 (58.4%) adults obtained the average score between 3.00-3.99 and 140 (28%) adults obtained the high score between 4.00 -5.00. The mean of empathy is 3.79 and the standard deviation is 0.57. This indicates that the level of emotional stability is average. On managing relations, it is observed that 34 (6.8%) adults obtained the low score between 1.00 - 2.99, 293 (58.6%) adults obtained the average score between 3.00-3.99 and 173 (34.6%) adults obtained the high score between 4.00 -5.00. The mean of managing relations is 3.91 and the standard deviation is 0.52. This indicates that the level of managing relations is average. With regard to integrity, it is observed that 62 (12.4%) adults obtained the low score between 1.00 - 2.99, 276 (55.2%) adults obtained the
the average score between 3.00-3.99 and 162 (32.4%) adults obtained the high score between 4.00 -5.00. The mean of integrity is 3.89 and the standard deviation is 0.62. This indicates that the level of integrity is average. On value orientation, it is also observed that 102 (20.4%) adults obtained the low score between 1.00 - 2.99, 261 (52.2%) adults obtained the average score between 3.00-3.99 and 137 (27.4%) adults obtained the high score between 4.00 -5.00. The mean of value orientation is 3.73 and the standard deviation is 0.73. This indicates that the level of empathy is average.

With regard to commitment, it is observed that 64 (12.8%) adults obtained the low score between 1.00 - 2.99, 270 (54%) adults obtained the average score between 3.00-3.99 and 166 (33.2%) adults obtained the high score between 4.00 -5.00. The mean of commitment is 3.99 and the standard deviation is 0.69. This indicates that the level of commitment is average. On altruistic behaviour, it is observed that 64 (12.8%) adults obtained the low score between 1.00 - 2.99, 280 (56%) adults obtained the average score between 3.00-3.99 and 156 (31.2%) adults obtained the high score between 4.00 -5.00. The mean of altruistic behaviour is 3.96 and the standard deviation is 0.65. This indicates that the level of altruistic behaviour is average. With regard to self-development, it is observed that 70 (14%) adults obtained the low score between 1.00 - 2.99, 272 (54.4%) adults obtained the average score between 3.00-3.99 and 158 (31.6%) adults obtained the high score between 4.00 -5.00. The mean of self-development is 3.95 and the standard deviation is 0.66. This indicates that the level of self-development is average.

The adults who score low on the dimensions of emotional intelligence are: self-awareness (62), empathy (51), self-motivation (33), emotional stability (68), managing relations (34), integrity (62), value orientation (102), commitment (64), altruistic behaviour (64) and self-development (70). This indicates that 11% of adults have interpersonal problems in their relationships.

**Table-2 shows the distribution of adults’ scores based on the dimensions of Interpersonal Problems**

<table>
<thead>
<tr>
<th>Dimensions of interpersonal problems</th>
<th>T-Score &lt; 70 (frequency)</th>
<th>Percentage</th>
<th>T-score &gt; 70 (frequency)</th>
<th>Percentage</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domineering</td>
<td>257</td>
<td>51.4</td>
<td>243</td>
<td>48.6</td>
<td>68.02</td>
<td>12.14</td>
</tr>
<tr>
<td>Vindictive</td>
<td>379</td>
<td>75.8</td>
<td>121</td>
<td>24.2</td>
<td>64.11</td>
<td>9.46</td>
</tr>
<tr>
<td>Cold</td>
<td>360</td>
<td>72</td>
<td>140</td>
<td>28</td>
<td>63.14</td>
<td>10.63</td>
</tr>
<tr>
<td>Socially inhibited</td>
<td>409</td>
<td>81.8</td>
<td>91</td>
<td>18.2</td>
<td>60.24</td>
<td>8.43</td>
</tr>
<tr>
<td>Non-assertive</td>
<td>336</td>
<td>67.2</td>
<td>164</td>
<td>32.8</td>
<td>63.77</td>
<td>10.43</td>
</tr>
<tr>
<td>Overly accommodative</td>
<td>469</td>
<td>93.8</td>
<td>31</td>
<td>6.2</td>
<td>57.91</td>
<td>8.05</td>
</tr>
<tr>
<td>Self-sacrifice</td>
<td>452</td>
<td>90.4</td>
<td>48</td>
<td>9.6</td>
<td>55.82</td>
<td>9.14</td>
</tr>
<tr>
<td>Intrusive</td>
<td>336</td>
<td>67.2</td>
<td>164</td>
<td>32.8</td>
<td>63.77</td>
<td>10.43</td>
</tr>
<tr>
<td>Total</td>
<td>375</td>
<td>75</td>
<td>125</td>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table-2 describes the distribution of adults’ scores based on the dimensions of Interpersonal Problems with their T-score, mean, percentage and standard deviation. As per the norms, the T-score less than 70 (<70) signifies that the adult does not have the interpersonal problems. On the other hand, the adults who have the T-score more than 70 (>70) denote that the adults have any one dimension or combination of dimensions of the interpersonal problems such as domineering, vindictive, cold, socially inhibited, non-assertive, overly accommodative, self-sacrifice and intrusive.

From the table-2, domineering is observed that out of 500 adults, 257 (51.4%) adults have obtained less than 70 on T-score and 243 (48.6%) adults have scored more than 70 on T-score. The mean ‘domineering’ score is found to be 68.02 and the standard deviation is 12.14. This indicates that 48.6% of adults have the interpersonal problems on domineering.
With regard to vindictive, it is observed that out of 500 adults, 379 (75.8%) adults have obtained less than 70 on T-score and 121 (24.2%) adults have scored more than 70 on T-score. The mean ‘vindictive’ score is found to be 64.11 and the standard deviation is 9.46. This indicates that 24.2 % of adults have the interpersonal problems on vindictive. With regard to cold, it is observed that out of 500 adults, 360 (72%) adults have obtained less than 70 on T-score and 140 (28%) adults have scored more than 70 on T-score. The mean ‘cold’ score is found to be 63.14 and the standard deviation is 10.63. This indicates that 28 % of adults have the interpersonal problems on cold.

With regard to socially inhibited, it is observed that out of 500 adults, 409 (81.8%) adults have obtained less than 70 on T-score and 91 (18.2%) adults have scored more than 70 on T-score. The mean ‘socially inhibited’ score is found to be 60.24 and the standard deviation is 8.43. This indicates that 18.2 % of adults have the interpersonal problems on socially inhibited. With regard to non-assertive, it is observed that out of 500 adults, 336 (67.2%) adults have obtained less than 70 on T-score and 164 (32.8%) adults have scored more than 70 on T-score. The mean ‘non-assertive’ score is found to be 63.77 and the standard deviation is 10.43. This indicates that 32.8 % of adults have the interpersonal problems on non-assertive. With regard to overly accommodative, it is observed that out of 500 adults, 469 (93.8%) adults have obtained less than 70 on T-score and 31 (6.2%) adults have scored more than 70 on T-score. The mean ‘overly accommodative’ score is found to be 57.91 and the standard deviation is 8.05. This indicates that 6.2 % of adults have the interpersonal problems on overly accommodative.

With regard to self-sacrifice, it is observed that out of 500 adults, 452 (90.4%) adults have obtained less than 70 on T-score and 48 (9.6%) adults have scored more than 70 on T-score. The mean ‘self-sacrifice’ score is found to be 55.82 and the standard deviation is 9.14. This indicates that 9.6 % of adults have the interpersonal problems on self-sacrifice. With regard to intrusive, it is observed that out of 500 adults, 336 (67.2%) adults have obtained less than 70 on T-score and 164 (32.8%) adults have scored more than 70 on T-score. The mean ‘intrusive’ score is found to be 63.77 and the standard deviation is 10.43. This indicates that 32.8 % of adults have the interpersonal problems on vindictive.

The obtained total score reveals that out of 500 adults, 375 (75%) adults have obtained less than 70 on T-score and 125 (25%) adults have scored more than 70 on T-score. The adult’s frequency that scored more than 70 on T-score is: domineering (243), vindictive (121), cold (140), socially inhibited (91), non-assertive (164), overly accommodative (31), self-sacrifice (48) and intrusive (164). This indicates that overall 25 % of adults have the interpersonal problems on the dimensions such as domineering, vindictive, cold, socially inhibited, non-assertive, overly accommodative, self-sacrifice and intrusive.

---

Table-3 shows the correlation score on the dimensions of emotional intelligence and the dimensions of interpersonal Problems of adults

<table>
<thead>
<tr>
<th>Dimensions of emotional intelligence</th>
<th>Domineering</th>
<th>Vindictive</th>
<th>Cold</th>
<th>Socially inhibited</th>
<th>Non-assertive</th>
<th>Overly accommodative</th>
<th>Self-sacrifice</th>
<th>Intrusive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-awareness</td>
<td>-.174**</td>
<td>.009</td>
<td>.067</td>
<td>-.010</td>
<td>-.181**</td>
<td>.054</td>
<td>-.178**</td>
<td>-.181**</td>
</tr>
<tr>
<td>Empathy</td>
<td>-.199**</td>
<td>-.015</td>
<td>.029</td>
<td>-.080</td>
<td>-.132**</td>
<td>-.046</td>
<td>-.212**</td>
<td>-.132**</td>
</tr>
<tr>
<td>Self-motivation</td>
<td>-.254**</td>
<td>-.096*</td>
<td>-.03</td>
<td>-.109**</td>
<td>-.217**</td>
<td>-.050</td>
<td>-.250**</td>
<td>-.217**</td>
</tr>
<tr>
<td>Emotional stability</td>
<td>-.149**</td>
<td>-.002</td>
<td>.056</td>
<td>-.031</td>
<td>-.120**</td>
<td>-.040</td>
<td>-.130**</td>
<td>-.120**</td>
</tr>
<tr>
<td>Managing relations</td>
<td>.007</td>
<td>.047</td>
<td>.032</td>
<td>-.062</td>
<td>-.063</td>
<td>-.009</td>
<td>.012</td>
<td>.063</td>
</tr>
<tr>
<td>Integrity</td>
<td>-.202**</td>
<td>-.072</td>
<td>.029</td>
<td>-.056</td>
<td>-.188**</td>
<td>-.019</td>
<td>-.185**</td>
<td>-.188**</td>
</tr>
<tr>
<td>Value orientation</td>
<td>-.188**</td>
<td>-.084</td>
<td>.043</td>
<td>-.137**</td>
<td>-.156**</td>
<td>-.084</td>
<td>-.172**</td>
<td>-.156**</td>
</tr>
<tr>
<td>Commitment</td>
<td>-.194**</td>
<td>-.021</td>
<td>.042</td>
<td>-.062</td>
<td>-.184**</td>
<td>-.040</td>
<td>-.180**</td>
<td>-.184**</td>
</tr>
<tr>
<td>Altruistic behaviour</td>
<td>-.212**</td>
<td>-.074</td>
<td>.016</td>
<td>-.086</td>
<td>-.183**</td>
<td>-.050</td>
<td>-.191**</td>
<td>-.183**</td>
</tr>
<tr>
<td>Self development</td>
<td>-.176**</td>
<td>-.034</td>
<td>.019</td>
<td>-.102**</td>
<td>-.218**</td>
<td>-.054</td>
<td>-.182**</td>
<td>-.218**</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed), **Correlation is significant at the 0.01 level (2-tailed).
The table 3 shows the correlation coefficient scores on the dimensions of emotional intelligence and the dimensions of interpersonal problems of adults. Pearson’s product moment correlation method is applied to find out the relationship between the dimensions of emotional intelligence and the dimensions of the interpersonal problems. From the table it is observed that the dimensions of interpersonal problems are negatively correlated and it is statistically significant with the dimensions of emotional intelligence at the 0.01 level of significance as well as at the 0.05 level of significance. Therefore the formulated hypothesis (Ha) that there is a significant relationship between the dimensions of interpersonal problems of adults and the dimensions of emotional intelligence is accepted.

**Discussion**

The present finding is in line with the earlier found results. The emotional intelligence and interpersonal problems are negatively associated. The individuals who scored high on the emotional intelligence scale are tend to have more positive and less conflictive relationship with others, more empathetic, self-monitoring in social situations which reflects the higher scores for social skills, displays more cooperation, close, affectionate responses towards the partners. Further the higher emotional intelligence among close friends indicates their higher self-perceived competence in reacting to their friend’s life events more positively. It confirms the earlier studies that the adults who were low on emotional intelligence, they experience more conflict and poorer relationship quality and highly related to social interaction anxiety. Thus the emotional intelligence plays a significant role in the establishment and maintenance of interpersonal relationship and contributes to the optimal social functioning. Theoretically low scores on emotional intelligence indicate higher interpersonal problems. In this present research, 11% of adults have scored low on the emotional intelligence that corresponds 25% of adults having interpersonal problems. This proves that the lower the score on the emotional intelligence would increase the possibility of having interpersonal problems. Hence therapeutically improving the emotional intelligence would create impact in reducing the interpersonal problems.

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**Declaration of conflicting interests:** The author declares that there is no conflict of interest. The conflict of interest is nil.

**Ethical Clearance:** Ethical clearance is taken from Center for Academic Research (CARE) Annamalai University, Psychology wing.

**Implication and limitation:** There research is done in an Indian context. This would help us to understand the importance of emotional intelligence in relation to the interpersonal problems: how these dimensions are related to each other and how the emotional intelligence would influence the emotions of the other persons. The finding would be helpful for developing strategies effectively in psychotherapy to improve the adult’s emotional intelligence which would be strengthened through awareness. As the result, the interpersonal problems would be reduced. On the other hand, the limitations as such, the sampling area covered in the present research is from non-clinical populations. Though the data were collected following the stratified random sampling, but the data was collected at the convenience of the researcher as well. Regarding the target population, young and middle adults were only included. The data analyzed for this study were originally meant for research purpose rather than for clinical analysis or making diagnosis.

**Conclusion**

Emotional intelligence plays a determinant role in the interpersonal relationship. Low level of emotional intelligence indicates the high level of interpersonal problems and vice versa. The interpersonal problems do not happen all of the sudden, rather the life experience forms the schema. The schema forms the emotional intelligence which embodies the interpersonal and intrapersonal competencies. That is the reason that individuals differ on the level of emotional intelligence. Hence improving the emotional intelligence through the psychotherapies would help the adults in enhancing their ability or competency to deal effectively with emotions. As the result, the adults would have lesser interpersonal problems.

**Reference**

2. Brackett MA, Warner RM, Bosco JS. Emotional


The Difference of Dental Anxiety Level on Healthcare and Non-Healthcare Students

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Abstract

Background: Dental anxiety can be a problem, both for dentists and patients. Basic Health Research states that as many as 57.6% of Indonesian people suffer from dental and mouth problems and only 10.2% of that number goes to the dentist, which can be caused by dental anxiety. Someone who has dental anxiety will avoid and refuse to check the condition of their teeth, which will adversely affect the health of the oral cavity.

Purposes: Examining the differences in levels of dental anxiety in healthcare and non-healthcare students at Universitas Airlangga.

Method: This study uses a quantitative type of cross-sectional method involving healthcare and non-healthcare students and is carried out throughout on campus A and campus B of Universitas Airlangga by random sampling. Data collection procedures were carried out through the Corah Dental Anxiety Scale (DAS) questionnaire with a few modifications that were disseminated online. Then the data analysis was performed using the chi square method to get results.

Result and Discussion: Based on research that has been done, healthcare students have a low percentage of dental anxiety levels of 64.6% where non-healthcare students have a high percentage of dental anxiety levels of 42.9%. Different levels of dental anxiety may be influenced by different levels of knowledge about oral health and dental health.

Conclusion: There is a significant difference in the level of dental anxiety in healthcare and non-healthcare students at Universitas Airlangga.

Keywords: Dental anxiety, healthcare students, non-healthcare students.

Introduction

Dental anxiety can be a problem, both for dentists and patients. The term dental anxiety refers to the specific response given by a patient to a dentist’s actions that can be associated with anxiety or fear¹. The high incidence of dental anxiety in patients can lead to negative responses that can complicate dental health care measures so it is difficult to get optimal treatment results²,³.

If someone experiences dental anxiety, they will certainly avoid and refuse to check the condition of their teeth⁴,⁵. This can adversely affect the health of the oral cavity, such as tooth loss, dental caries and poor periodontal tissue conditions⁶. Based on the Basic Health Research in Indonesia on 2018, as many as 57.6% of Indonesian people, especially adults and adolescents,
suffer from dental and mouth problems, but only 10.2% of sufferers of the problem get treatment from dentists.

Anxiety and fear of a thing can arise when there is no or lack of knowledge and experience of a person to the thing. Among students, differences in the scope of studies will lead to different perceptions of a matter, one of which is about dental health. Students with a scope of study in the field of health will have a different perception than students in the scope of non-health studies of dental health which will make a difference in the level of dental anxiety. Therefore, the authors would like to see differences in the level of dental anxiety among healthcare and non-healthcare students.

This study has a general objective to determine differences in the level of dental anxiety in healthcare and non-healthcare students at Universitas Airlangga, with the specific purpose of analyzing the differences in levels of dental anxiety in healthcare and non-healthcare students at Universitas Airlangga. The author hopes that with this research, for educational institutions, it can be a scientific contribution in learning about dental anxiety and for students, it can be a means of adding insight, especially in the case of dental anxiety.

Research Method

This research is a type of quantitative research with a cross-sectional design, which is data retrieval in a certain period of time. Data collection from samples is done at the same time. The use of cross-sectional study is carried out in the same period, not in the past or future from the formulation of the existing problem. This type of research is more practical to examine the quantity of different levels of anxiety and fear in healthcare and non-healthcare students at Universitas Airlangga.

This research was conducted throughout Campus A of Universitas Airlangga and Campus B of Universitas Airlangga, because this study involve a sample of healthcare and non-healthcare students at Universitas Airlangga. The research targets that must be achieved at least are at least 50 campus A students at Universitas Airlangga and 50 campus B students at Universitas Airlangga as research samples.

In this study, questionnaires with closed questions were used as research instruments. Questionnaire with closed questions is a questionnaire that gives options or options to respondents to choose the answers available in the questionnaire. The questionnaire in this study consisted of 5 questions and will be distributed online to respondents.

Data taken from questionnaire related to dental anxiety. The questionnaire we used in this study was a modified version of the Corah Dental Anxiety Scale (DAS), which contained several additional questions to refer to the respondents’ feelings about local anesthetic injections with a main reference to the injection site, because the pain experienced with local anesthetic injections varied according to its location in the mouth. In addition, the simplified 5-point scale answering scheme is designed from not worried to very worried. The modified dental anxiety scale (MDAS) contains 5 multiple choice items including the following:

- If you go to the dentist for treatment tomorrow, how do you feel?
- If you sit in the dentist practice waiting room, how do you feel?
- If you find that your teeth will be drilled, how do you feel?
- If you do scaling and polishing on your teeth, how do you feel?
- If you are going to get an injection of local anesthetic in your gum, how do you feel?

Scores for each of the 5 response items are summarized to provide estimated values of dental anxiety. Other data that we will include in the questionnaire that will be given to the sample are Gender, Year Class, Faculty and Study Program.

The data was taken using an online questionnaire in the form of a google containing sample data source questions that will be distributed to students of the faculty of healthcare and non-healthcare faculty students of Universitas Airlangga.

Data was collected by distributing online questionnaires containing sample data source questions through social media or distributing messages through groups containing students from the healthcare and non-healthcare faculties of Universitas Airlangga. The study was conducted by random sampling of the study population. Data collection is done every day for one week until the data sample is met or more than the target data depending on the time specified for one week. If within one week the sample does not match the target data,
the data collection will continue until H + 3 from the predetermined timeline.

Data collected will be analysed using the Chi Square method. Chi Square is one type of non-parametric comparative test conducted on two variables, where the scale of the data for both variables is nominal.

The basic principle of the chi square test is to compare the frequency that occurs (observation) with the frequency of expectations (expectations). If the observed frequency values are the same with the expected frequency values, then there is no meaningful (significant) difference and vice versa, if the value of the observation frequency and the expectation frequency value are different, then there is a meaningful (significant) difference.

**Result**

**Table 1 Results of Differences in Dental Anxiety Levels in Healthcare and Non-Healthcare Students of Universitas Airlangga using the Chi Square method**

<table>
<thead>
<tr>
<th>Students Major</th>
<th>Level of Dental Anxiety</th>
<th>Total (%)</th>
<th>P-value</th>
<th>Contingency Coefficient</th>
<th>Prevalence Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High (%)</td>
<td>Low (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healthcare</td>
<td>23 (35,4%)</td>
<td>42 (64,6%)</td>
<td>65 (57%)</td>
<td>0,032</td>
<td>0,032</td>
</tr>
<tr>
<td>Non-Healthcare</td>
<td>28 (57,1%)</td>
<td>21 (42,9%)</td>
<td>49 (43%)</td>
<td></td>
<td>1,472</td>
</tr>
<tr>
<td>Total</td>
<td>51</td>
<td>63</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on table 1, the results showed that of 65 healthcare student correspondents, 42 of them had low levels of dental anxiety and 23 other students had high levels of dental anxiety. Whereas in the 49 non-healthcare student correspondents, there were 21 students who had low levels of dental anxiety and 28 other students had high levels of dental anxiety. Based on table 1, the significance value is 0.032. While the alpha standard value is 0.05. Significance values that were more than the alpha standard did not show significant differences, whereas significance values that were less than the alpha standard showed significant differences. So the results in table 1 can be said to be significant.

**Table 2. Comparison of the Number of Healthcare and Non-Healthcare Students Feeling Fear of a Dental Action Condition**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Students Major</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Healthcare (%)</td>
<td>Non-Healthcare (%)</td>
</tr>
<tr>
<td>Doing a checkup to the dentist</td>
<td>1 (1,5%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Waiting in dentist waiting room</td>
<td>1 (1,5%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Drilling will be performed on the teeth</td>
<td>5 (7,7%)</td>
<td>9 (18,4%)</td>
</tr>
<tr>
<td>Scaling and cleaning will be done</td>
<td>1 (1,5%)</td>
<td>2 (4,1%)</td>
</tr>
<tr>
<td>Getting injection (local anesthesia) on the gum</td>
<td>14 (21,5%)</td>
<td>11 (22,4%)</td>
</tr>
</tbody>
</table>

Based on table 2, the results are obtained that of 65 healthcare student correspondents, 1 of them felt afraid when going to visit the dentist, while waiting in the waiting room of the dentist’s clinic, as well as when it would be done to scaling and polishing. While of the 49 non-healthcare student correspondents, there were no students who felt afraid when they were going to visit the dentist and while waiting in the waiting room of the
dentist clinic, but there were 1 students who felt afraid of the act of scaling and polishing. In the drilling action, there were 5 healthcare students who felt afraid, while in non-healthcare students there were 9 students who felt afraid of the action. Fear most felt by students on the condition of care that requires the provision of local anesthesia on the gums, found 14 healthcare students and 11 non-healthcare students who are afraid of these actions.

Discussion

Based on the results of the study in table 1 related to differences in the level of dental anxiety in healthcare and non-healthcare faculty students at Universitas Airlangga shows that the healthcare faculty students have a low dental anxiety level of 64.6%, whereas in students from non-healthcare faculties have a low dental anxiety level of 42.9%. These percentages illustrate that healthcare faculty students in general have lower levels of dental anxiety when compared to students from non-healthcare faculties. These different levels of dental anxiety can be influenced by differences in the level of knowledge about oral health and dental health. Healthcare students are considered to have higher knowledge and awareness compared to non-healthcare students, so many healthcare students are more likely to take care of their health and one of them is dental and oral health. The main reason is because basically, healthcare students are already equipped with knowledge about dental and oral health, both basic and specific. With this knowledge that is considered good, there will be a sense of familiarity with the care actions that will be taken when patients come to visit the dentist. Whereas for non-healthcare students with lower levels of knowledge and information, there is no familiarity and there is no description of the treatment actions that will be taken when patients come to the dentist so that it will cause anxiety to fear.

Based on table 2 related to the results of a survey regarding fear of a certain dental care condition, the highest results were obtained for injections (local anesthesia) in the gums, which was 21.5% in healthcare students and 22.4% in non-healthcare students. This indicates that in general, patients feel anxious or afraid when they will get anesthesia. Fear of using anesthesia can be caused by the patient having never received anesthesia before, anxiety if the anesthesia process does not take place smoothly, fear if awakened/awakened during operative measures and anxiety about some of the side effects of the anesthetic drug itself.

The importance of proper diagnosis of dental anxiety cannot be underestimated. Identifying anxious patients helps dental health practitioners in planning treatment actions with appropriate procedures for patients. Some method that can be performed by dental health practitioners to deal with patients with dental anxiety is to do a communication approach to patients before treatment.

High levels of dental anxiety can be minimized by means of education about oral health and teeth, regular visits to the dentist at least every 6 months and from the communication and good relationships with patients.

Conclusion

There is a significant difference in the level of dental anxiety in healthcare and non-healthcare students at Universitas Airlangga.

Conflict of Interest: There are no conflicts of interest.

Source of Funding: Self-Funding

Ethical Clearance: Approved

References

6. Appukuttan D. Strategies to manage patients with


Social Impacts of Child Marriage in Grobogan Regency, Central Java Province, Indonesia

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Abstract

\textbf{Background:} The prevalence of child marriage in Indonesia has more than doubled in the last three decades but is still one of the highest in the East Asia and Pacific region. In the Grobogan District in 2016 an increase in the number of marriages at an early age in women was 36.5 percent. This study is a qualitative-naturalistic study. The main data source of this study is the results of Focus Group Discussions, interviews and observations and also supported by secondary data in the form of previous research results. The reason for early marriage is mostly due to the incidence of pregnancy outside marriage in adolescents. It is suspected that there is a relationship between early marriage, low level of education and poverty. Religious education, morals and strict control from parents, schools and communities must be done with a variety of strategies, because most of the reasons for early marriage are getting pregnant first.

\textbf{Keywords:} Child marriage, education, poverty, multi-strategies.

Introduction

The prevalence of child marriage in Indonesia has declined for more than twofold in the last decade but is still one of the highest rates in East Asia and Pacific. The National Social and Economic Survey conducted by the Central Bureau of Statistics in 2012 shows that 25 percent of 20-24 years old married women marry when they are under 18 years old\textsuperscript{(1)}.

Based on the IDHS in 2012, 17% of 20-24 years old married women marry when they are under 18 years old\textsuperscript{(2)}. Indonesia is one example of global progress towards removal of child marriage practice with five percent of prevalence decline between IDHS issued in 2007 and 2012.

Central Bureau of Statistics (BPS)-UNICEF’s report shows that the prevalence of child marriage in Indonesia is not only still high (with more than one-third girls marry before they get to adult or about 340,000 girls annually) but the prevalence has increased instead\textsuperscript{(3)}.

Furthermore, although girl under 15 years old marriage has declined, but the prevalence of 16 and 17 years old girl marriage increases continuously, showing that girls protection decline when they are 16 years old. It is important to note that child under 15 years old marriage may not reflect the actual prevalence since many of these marriages are disguised as above 16 years old or unregistered girl marriage\textsuperscript{(3)}.

There is a complex relationship between child marriage and education in Indonesia. Girls who marry before 18 years old have lower education level than unmarried girls, particularly after Elementary School. Besides, younger married children have lower education level than older married children. Girls tend not to continue their education after their marriage\textsuperscript{(3)}.

The percentage of 20-24 years old girl marriage gets lower in line with increasing education level. The percentage of Elementary School girl marriage (40.5
percent) is significantly different from they who continue 
their education to high school (5.0 percent). These 
numbers show that investment in secondary school for 
girls, especially high school, is one of the best ways to 
ensure that girls get to adulthood before marriage(3).

At regional level, in the 2013-2018 Regional 
Medium-Term Development Plan (RPJMD) of Central 
Java Province, the achieved target rate of marital age 
under 20 years old in 2016 is 1.19%. The rate of marital 
age under 20 years old in 2015 is 2.42%; while the rate 
of marital age under 20 years old in 2016 is 1.05%, 
which means that the decline is significant of 1.37%. 
The rate of marital age under 20 years old in 2016, in 
comparison with the target, has achieved the target 
defined in 2013-2018 RPJMD. In 2016, the highest rate 
of Marital Age Women or WUS under 20 years old is 
that in Batang Regency of 2.25%, while the lowest rate 
of WUS under 20 years old is that in Magelang City of 
0.30%. In Grobogan Regency, the rate of marital age 
under 20 years old in 2015 is 4.71% and declines to 
1.93% in 2016.

According to the data from the Ministry of Religious 
Affairs Office of Grobogan Regency, there are 21 men 
and 27 women who marry when they are under 16 years 
old in 2014. This number keeps increasing, consecutively 
to 21 men and 93 women in 2015, to 26 men and 127 
women in 2016 and there are 19 men and 17 women 
only in January 2017. The main reasons of these early 
age marriages are: unwed pregnancy of 927 people and 
in avoidance of adultery of 1,169 people.

From such initial data, it is clearly important to 
conduct a research of early age marriage for material to 
design policies or programs to reduce early age marriage 
rate and prevent any of its consequences.

**Method**

This research’s main source of data is numbers 
generated from Surveys conducted by BPS and relevant 
institutions, results of Focus Group Discussion (FGD) 
and, if possible, interview and observation results, 
supported with secondary data in the form of previous 
researches’ results. The secondary data are obtained 
from the results of surveys conducted by Central 
Bureau of Statistics and other institutions. These data 
and information are understood naturally without 
manipulation and arrangement using experiment or test. 
In other words, this research tends to be qualitative (4).

The research location is all administrative area of 
Grobogan Regency, which is determined based on the 
fact that this Regency has a relatively complex early age 
mariage phenomenon. The poverty rate of this Regency 
is relatively high with its rural culture.

**Results**

Grobogan Regency has child marriage problem. 
According to the data of the Central Bureau of Statistics, 
the percentage of 17-18 years old girl marriage in 
Grobogan Regency in 2013 is relatively high of 28.55%, 
but from the perspective of First Marriage Age <17 
years old, Grobogan Regency is in the first order of 
Child Marriage rate with a percentage of 34.95%. 
Meanwhile, according to the data of Family Planning 
Office of Grobogan Regency, there are 3,142 cases of 
child marriage in Grobogan in 2012, which increases to 
4,072 cases in 2014.

In 2015, there are 110 cases of women and 
children abuse, 3,225 cases of divorce and 5 cases of 
law enforcement from investigation to court order for 
women and children abuse. There are 25 cases of child 
dealing with the law with Restorative Justice Approach 
settlement, 55 cases of woman and children abuse under 
health care of trained health workers in Community 
Health Center and 11 cases of woman and children abuse 
with legal assistance service. Meanwhile, the percentage 
of active institutions is up to 50% with coverage of 123 
gender based violence service institutions.

There are three subdistricts in Grobogan Regency 
of which early age marriage rate is very high, namely 
Ngaringan Subdistrict, Pulokulon Subdistrict and Gabus 
Subdistrict. These three subdistricts are expected to poor 
area. Central Bureau of Statistics’s data show that the 
three subdistricts have no fertile land with irrigation(7). 
Gabus Subdistrict’s 3,901ha farm is rain-fed rice field, 
Pulokulon Subdistrict’s 5,665 ha farm is rain-fed rice 
field and only 10 ha is covered by irrigation and in 
Ngaringan Subdistrict, more than 3,000 ha farm is rain-
fed rice field.

According to BPS data, 65.14 percent of Pulokulon 
Subdistrict people and 73.53 percent of Gabus Subdistrict 
people are classified into poor family. In Ngaringan 
Subdistrict 86.76 percent of people are classified 
into non-prosperous family(7). This fact confirms the 
preumption that it is possible that poor families have 
their daughters married when they are young as an effort 
to release some of its economic burdens.
### Table 1. Under 20 Years Old Married Population in Grobogan Regency in 2015

<table>
<thead>
<tr>
<th>Subdistrict</th>
<th>Men</th>
<th>Women</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kedungjati</td>
<td>30</td>
<td>299</td>
<td>329</td>
</tr>
<tr>
<td>Karangrayung</td>
<td>73</td>
<td>770</td>
<td>840</td>
</tr>
<tr>
<td>Penawangan</td>
<td>39</td>
<td>456</td>
<td>495</td>
</tr>
<tr>
<td>Toroh</td>
<td>62</td>
<td>762</td>
<td>824</td>
</tr>
<tr>
<td>Geyer</td>
<td>40</td>
<td>545</td>
<td>585</td>
</tr>
<tr>
<td>Pulokulon</td>
<td>63</td>
<td>1,086</td>
<td>1,149</td>
</tr>
<tr>
<td>Kradenan</td>
<td>61</td>
<td>853</td>
<td>914</td>
</tr>
<tr>
<td>Gabus</td>
<td>46</td>
<td>822</td>
<td>868</td>
</tr>
<tr>
<td>Ngaringan</td>
<td>63</td>
<td>1,095</td>
<td>1,158</td>
</tr>
<tr>
<td>Wirosari</td>
<td>66</td>
<td>933</td>
<td>999</td>
</tr>
<tr>
<td>Tawangharjo</td>
<td>29</td>
<td>531</td>
<td>560</td>
</tr>
<tr>
<td>Grobogan</td>
<td>41</td>
<td>673</td>
<td>714</td>
</tr>
<tr>
<td>Purwodadi</td>
<td>47</td>
<td>624</td>
<td>671</td>
</tr>
<tr>
<td>Brati</td>
<td>28</td>
<td>418</td>
<td>446</td>
</tr>
<tr>
<td>Klambu</td>
<td>17</td>
<td>270</td>
<td>287</td>
</tr>
<tr>
<td>Godong</td>
<td>39</td>
<td>342</td>
<td>381</td>
</tr>
<tr>
<td>Gubug</td>
<td>41</td>
<td>403</td>
<td>444</td>
</tr>
<tr>
<td>Tegowanu</td>
<td>37</td>
<td>337</td>
<td>374</td>
</tr>
<tr>
<td>Tanggungharjo</td>
<td>21</td>
<td>118</td>
<td>209</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>840</strong></td>
<td><strong>11,407</strong></td>
<td><strong>12,247</strong></td>
</tr>
</tbody>
</table>


### Table 2. Data of Under 16 Years Old Marriage in Grobogan Regency in 2014-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>21</td>
<td>77</td>
</tr>
<tr>
<td>2015</td>
<td>21</td>
<td>93</td>
</tr>
<tr>
<td>2016</td>
<td>26</td>
<td>127</td>
</tr>
<tr>
<td>2017</td>
<td>19</td>
<td>17</td>
</tr>
</tbody>
</table>

Prevalence of child marriage in Indonesia is not only still high (with more than one sixth girls marry before they reach adulthood or about 340,000 girls annually), but the prevalence has also re-increased. Moreover, although under 15 years old girl marriage has declined, but the prevalence of 16-17 years old girl marriage continuously increases, showing that girl protection decreases when they are 16 years old(3).

Table 3 shows that educational factor is likely to influence early age marriage or divorce. From the table, it is clear that they who are divorced/married mostly have Junior High School or lower education. The low education level causes unemployment and poverty. Having children married is one way to release parents’ responsibility or is caused by girl’s premarital pregnancy. From Table 3, it is clear that low education factor is expectedly the cause of high rate of divorce for young (under 20 years old) couples in Grobogan Regency. This assumption is confirmed in Table 3, that they who are married/divorced are mostly homemakers.
Table 3. Under 20 Years Old Married/Divorced Population by characteristics in Grobogan Regency in 2015

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Sex</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No/Pre-Elementary School</td>
<td>7</td>
<td>61</td>
</tr>
<tr>
<td>Not Graduated from Elementary School</td>
<td>12</td>
<td>203</td>
</tr>
<tr>
<td>Elementary School</td>
<td>82</td>
<td>2,792</td>
</tr>
<tr>
<td>Junior High School</td>
<td>80</td>
<td>2,317</td>
</tr>
<tr>
<td>Senior High School</td>
<td>23</td>
<td>309</td>
</tr>
<tr>
<td>Diploma I/II</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Diploma III</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Diploma IV/Bachelor</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Master</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Doctor</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>7</td>
<td>130</td>
</tr>
<tr>
<td>Homemaker</td>
<td>0</td>
<td>3,386</td>
</tr>
<tr>
<td>Student</td>
<td>11</td>
<td>84</td>
</tr>
<tr>
<td>Farmer/Planter</td>
<td>13</td>
<td>184</td>
</tr>
<tr>
<td>Private Employee</td>
<td>76</td>
<td>840</td>
</tr>
<tr>
<td>Casual Employee</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Merchant</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>93</td>
<td>1,052</td>
</tr>
<tr>
<td>Total</td>
<td>204</td>
<td>5,682</td>
</tr>
</tbody>
</table>


Discussion

The poor will utilize any existing economic sources in case of change to economic condition, one effort of which is to use family’s manpower, including children. Based on the phenomena, it is clear that education is the key to hold down the early age marriage rate\(^8\). If the reason they stop their education is the fee, Government’s role should be improved in providing education facilities.

It is expected that the occurrence of early age marriage in Grobogan is at least influenced by three factors, namely: women’s averagely low education, poverty and moral issue (premarital pregnancy). Cultural factor is not yet found. Woman who marry young tend to be less educated, raise children too early and not have decision-making power in household. In other words, adolescent marriage is unfavorable since they are basically in their adolescence that, according to psychological study, is a transitional phase from childhood to adulthood\(^5\)(\(^6\)). With adolescent’s transitional characteristics, they are supposed to be unstable, while marriage practically demands one’s high responsibility. Responsibility gets higher and heavier with Unintended Pregnancy. The expected impact to arise is conflicts which may impair child’s growth and development and continuity of family\(^3\).

Early age marriage is also expectedly caused by poverty. The poverty rate in Grobogan Regency in 2015 is 13.68%, relatively higher than the national average (11.13%) and that of Central Java Province (13.27%).

It is also important to note that under 15 years old
child marriage may not reflect the actual prevalence since many of these marriages are disguised as above 16 years old or unregistered girl marriage.

That there are many cases of early age marriage because of premarital pregnancy shows that social norms have declined in the society in line with globalization and information advancement. It is assumed that besides Grobogan Regency, many cases of student’s premarital pregnancy occur in various regions. The cause is expectedly the advancement of information technology, in which porn websites are easily accessed (9). Consequently, many students follow promiscuous lifestyle, that they have premarital sexual intercourse. Girls with premarital pregnancy certainly need psychological accompaniment so that their mental remains stable, particularly when facing their family’s or society’s anger (10). In rural environment, there should be real measure in monitoring, for example, city park should not be left dark, internet center should have no partition and students should always be controlled when they skip school (10).

Girl’s marriage in too young age causes early pregnancy and delivery, which are correlated with mother’s high death rate and abnormal condition since girl’s body is not mature yet to give birth (11). This fact also conforms to what is stated in the 2011-2016 Regional Medium-Term Development Plan of Grobogan Regency. The Infant Mortality Rate (IMR) in Grobogan Regency increases from 8.78 per 1,000 live births in 2011 to 17.44 per 1,000 live births in 2015.

Maternal Mortality Ratio (MMR) in Grobogan Regency is relatively high of 149.92 per 100,000 live births in 2015. This number increases from the 2011 actual MMR of 114.03 per 100,000 live births. The 2015 actual MMR in Grobogan Regency exceeds 2015 MDGs target of 102 per 100,000 live births. The common causes of maternal mortality are: severe eclampsia and hemorrhage(12).

Conclusion

Based on the study, the following conclusions are made:

• The high rate of early age marriage in Grobogan Regency is contributed to by moral issue;
• There is expectedly correlation between early age marriage and low education level in Grobogan Regency;
• Phenomenon of low education level and poverty is like an endless circle. Girls’ low education level is obstructed by poverty and it is poverty that leads to girls’ and their family’s low education level;
• Poverty expectedly causes parents’ financial problem, which drives them to have their daughters married, whether consciously or not, as a means to “release their responsibility” as parents;
• Early age marriage expectedly causes high maternal mortality ratio and under-five mortality rate and divorce rate at young age.

Suggestions:

• Religious and moral teaching and strict control of parents, school and society should be performed with various strategies, since the main cause of early age marriage is premarital pregnancy.
• To make incessant campaign of how dangerous early age marriage is by involving all parties: government, society figure, religious figure, village officials, school, religious study group, etc;
• To establish psychological consultation institution for adolescents in relationship, adolescents with premarital pregnancy, married adolescents and female adolescents with domestic violence. The government of Grobogan Regency may cooperate with NGO, higher education institution, hospital, etc. In this institution, parents are to be involved for familiar dialog with children so that they will not have unhealthy relationship;
• To enhance school’s participation to be the main priority. School should also provide special counseling service considering that moral crisis is at emergency level. Curriculum of danger of early age marriage, reproduction health and danger of sexually transmitted diseases, HIV, etc. should be the main concern.
• To provide sufficient fund to increase the poor’s “purchasing power” in education, besides relieving Educational Management Contribution, also scholarship program, additional food support, transportation support, or to change study method and hours so that poor children may still help their parents to work, while they can still go to school in the afternoon, etc.;
• Opportunity of allocated economic empowerment, particularly for girls, is very important to eliminate
child marriage, in the framework of protection to promote their education, skills and financial control.

- Access to economic services, financial institution, microeconomic development training, etc. should be prioritized. Various financial lending should be facilitated for girls who discontinue their education so that they will develop their skills and economy;

**Ethical Clearance:** Nill. This research was conducted without treating informants.

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**Conflict of Interest:** The authors have no conflict of interest with the material presented in this paper

**References**

Profile of Death Due to Thermal Burns: A Retrospective Study

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Abstract

Fire is one of the important element of life, it is both useful (in cooking, producing warmth in winter, in cremation etc.) as well as harmful (by producing thermal burn injuries, blast injuries, forest fire, crop burning, volcanic eruption etc.) to the mankind. Burn injury is now becoming the major cause of death among unnatural deaths in various regions of the country and world. Majority of the burn cases occur at home due to smoking, defective electrical wiring, defective kerosene stove bursts, attempted suicides by self-immolation, homicidal burns of young women by husband or in-laws (dowry deaths). The present study was based on retrospective analysis of post mortem cases of thermal burns during the period from January 2018 to December 2018 in the Department of Forensic Medicine and Toxicology, Bundelkhand Medical College, Sagar (M.P). During this period total 349 autopsies were conducted, out of which majorities of death, 116 cases were due to burn. Majority of the victims were married hindu females belonging to age group of 21-30 years. Of these cases carbon soot particles in trachea were present in 7% of cases and kerosene smell was present in 21% cases. Most of deaths were accidental account for 78.44% cases. Police inquest was conducted in 76% of the cases and rest of the cases were magistrate inquest. In 52(44.82%) cases, 60-80% of Total Body Surface Area (TSBA) was burnt of all body parts upper extremities were commonly involved in about 96.55% cases. Accidental burn injuries are preventable and can be reduced by bringing about regulations to develop safer cooking appliances, promoting less inflammable fabrics to be worn at home and educating the community especially women.

Keywords: Thermal burns, Married female, Soot particles, Kerosene smell.

Introduction

Burns are the injuries that are produced by the application of dry heat such as flame, radiant heat and some heated solid substance like metal or glass to the surface of the body resulting in tissue destruction. In young adult population, about 40% burn is fatal.1

There are varieties of types of lethal and nonlethal thermal injury, including flame burns which char skin and singe hair, scalding from hot fluids and contact burns those result from touching hot objects. An estimated 180 000 deaths every year are caused by burns and among those, vast majority occur in low and middle-income countries. In India, every year 1000000 people are moderately or severely injured due to burn injury.2

Burn injuries are the 4th most common type of trauma all over the world, following traffic accidents, falls and interpersonal violence.3

The accidental burn injury is the commonest manner of burns.4 Accidental burn are commonly seen in females as most of the females (housewives) spend most of their time in household work especially in kitchen. Burn is also important mode of suicide and homicide in the world. Setting of fire to self (self-immolation) in public is done to attract the attention of government and media regarding political affairs, personal problems. Sometimes people resort to criminal acts like murder, rape and for concealing the facts, they try to burn the body of crime.

Dowry death is still a subject of major concern in our recent modern society in spite of strict law and amendment in the acts.5 Almost every day we read in newspapers and see in electronic media, cases of young
women either being burnt or provoked to commit suicide by the husband and in-laws, just for the dowry.\textsuperscript{6}

**Materials and Methodology**

The present study is a retrospective study carried out in the Department of Forensic Medicine & Toxicology, Bundelkhand Medical College, Sagar (M.P). A total of 349 autopsies were performed during the period of Jan 2018 to Dec 2018, out of which 116 thermal burn deaths were analysed. The detailed analysis of these cases was based on the inquest record, hospital records and evaluation of autopsy reports. Various parameters like age, sex, religion, carbon soot particles in trachea, presence of kerosene smell, type of inquest, manner of death, marital status, body parts burnt and TBSA burnt were taken into consideration. The information was compiled, tabulated and analysed.

**Results**

During the period of one year from 1\textsuperscript{st} Jan 2018 to 31\textsuperscript{st} Dec 2018, total 349 autopsies were conducted, out of which 116 (33.2\%) cases were due to burn. Out of total cases of burn, 22 (19\%) were male and 94 (81\%) were female and male: female ratio was 1:4.2. (Graph 1).

Taking age group into consideration, maximum incidence of burn injuries in males were noted in the age group of 21-30 years i.e. 8 (6.89\%) whereas in the age group of above 50 years no case was reported. The maximum incidence in females was noted in the age group of 21-30 years i.e. 48 (41.37\%) and minimum in the age group of 1-10 years i.e.3 (2.58\%) cases. Taking overall population into consideration, Maximum incidence of burn injuries were noted in the age group of 21-30 years i.e. 56 (48.27\%) and minimum in the age group of above 50 years i.e. 4 (3.44). (Table 1).

Looking into the marital status among the burn cases, married cases were higher 96 cases (82.75\%) as compared to unmarried cases 20 cases (17.24\%). Out of total married cases,80 (83.3\%) victims were female while the rest 16 (16.6\%) were male. Most of the victims belong to the Hindu community comprising 110 (94.82\%) and the rest 06 (5.17\%) were from Muslim community. Female victim predominance were seen in both Hindus (90 cases out of 110) and Muslims (4 cases out of 6).

Out of all burn cases, deposition of carbon soot particles in trachea was observed in 08 (7\%) cases. (Graph 2) Kerosene smell was present in 24 (21\%) cases, absent in 92 (79\%) cases.

Out of total 116 burn cases, magistrate inquest was carried out in 28(24\%) cases and police inquest in 88(76\%) cases. In most of the burn victims the manner of death was accidental in 91 cases (78.4\%) followed by suicidal in 18 cases (15.5\%) and 07 cases (6\%) shows homicidal pattern. (Graph 3)

Distribution of burn cases according to involvement of Total Body Surface Area (TBSA), shows that in majority of burn cases (52.6\% cases) TBSA was above 60\%, followed by 35.3\% cases with 41-60\% of TBSA. Only 12\% cases died with TBSA less than 40\%. In 10.34\% male cases, TBSA involved was 41-60\% and in females, in 39.65\% cases TBSA involved was 61-80\%. (Table 2).

In burnt areas upper extremities were most commonly affected i.e. in 112 (96.55\%) cases, followed by head, neck and face in 105 (90.51\%) cases. Genitalia was the least affected and involved in 27 (23.27\%) cases. (Table 3).

![Graph 1: Sex Wise Distribution of Burn Cases](image-url)
Table 1: Age wise Distribution of Burn Cases (n=116)

<table>
<thead>
<tr>
<th>Age</th>
<th>Male (%)</th>
<th>Female (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>02 (1.72)</td>
<td>03 (2.58)</td>
<td>05 (4.31)</td>
</tr>
<tr>
<td>11-20</td>
<td>02 (1.72)</td>
<td>19 (16.37)</td>
<td>21 (18.10)</td>
</tr>
<tr>
<td>21-30</td>
<td>08 (6.89)</td>
<td>48 (41.37)</td>
<td>56 (48.27)</td>
</tr>
<tr>
<td>31-40</td>
<td>07 (6.03)</td>
<td>14 (12.06)</td>
<td>21 (18.10)</td>
</tr>
<tr>
<td>41-50</td>
<td>03 (2.58)</td>
<td>06 (5.17)</td>
<td>09 (7.75)</td>
</tr>
<tr>
<td>&gt;50</td>
<td>00</td>
<td>04 (3.44)</td>
<td>04 (3.44)</td>
</tr>
<tr>
<td>Total</td>
<td>22 (18.96)</td>
<td>94 (81.03)</td>
<td>116 (100)</td>
</tr>
</tbody>
</table>
Table 2: Distribution of burn cases according to involvement of total body surface area (n=116)

<table>
<thead>
<tr>
<th>Total Body Surface Area Involved</th>
<th>Male (%)</th>
<th>Female (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40%</td>
<td>04 (3.44)</td>
<td>10 (8.6)</td>
<td>14 (12.06)</td>
</tr>
<tr>
<td>41-60%</td>
<td>12 (10.34)</td>
<td>29 (25.0)</td>
<td>41 (35.34)</td>
</tr>
<tr>
<td>61-80%</td>
<td>06 (5.17)</td>
<td>46 (39.65)</td>
<td>52 (44.82)</td>
</tr>
<tr>
<td>&gt;80%</td>
<td>0</td>
<td>09 (7.75)</td>
<td>09 (7.75)</td>
</tr>
<tr>
<td>Total</td>
<td>22 (18.96)</td>
<td>94 (81.03)</td>
<td>116 (100)</td>
</tr>
</tbody>
</table>

Table No. 3: Distribution of burn injuries on the body (n=116)

<table>
<thead>
<tr>
<th>Area of body burnt</th>
<th>Total no. of cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head, neck and face</td>
<td>105</td>
<td>90.51%</td>
</tr>
<tr>
<td>Chest and abdomen</td>
<td>101</td>
<td>87.06%</td>
</tr>
<tr>
<td>Back</td>
<td>84</td>
<td>72.41%</td>
</tr>
<tr>
<td>Upper Extremities</td>
<td>112</td>
<td>96.55%</td>
</tr>
<tr>
<td>Lower Extremities</td>
<td>95</td>
<td>81.89%</td>
</tr>
<tr>
<td>Genitalia</td>
<td>27</td>
<td>23.27%</td>
</tr>
</tbody>
</table>

Discussion

In the present study of deaths due to burn injuries, female (81%) dominates male (19%) in the incidence on the basis of sex, which is similar with the finding of other similar studies. Females were more susceptible to burn injuries as they spend most of their time in the kitchen and are involved in the activities which require fire like cooking food, making tea, boiling water etc. As we see in rural area most of the houses have no proper equipment for cooking and other fire related work, so in such area female are more prone for burn injuries. But in fewer studies slight male predominance was also observed. The reason for male predominance could be occupational hazard.

Age group of 21-30 years have maximum incidence of deaths due to burn in both males i.e. 8(6.89%) and females i.e. 48(41.37%). Similar findings were observed in other studies. This age group of 21-30 years is the young adult group and is the most common age for marriage in this area of study.

In the present study, it was observed that 96 (82.75%) victims were married and 20 (17.24%) were unmarried. Out of the females 80 (68.96%) were married and 14 (12.06%) were unmarried in contrast to males 16 (13.79%) were married and 06 (5.17%) were unmarried. Similar finding was also noted in other studies. Majority of victims were married female, this might be because of their involvement in domestic cooking work and dowry deaths.

Most of the victims belonged to the Hindu community i.e. 110(94.82%) as compared to Muslims i.e. 06(5.17%). Among the Hindus, majority of victims were female i.e. 90(81.8%) as compared to males i.e. 20(15.2%). which is similar to the findings of previously mentioned studies. This is because in this part of the world and more specifically in this region Hinduism is the most commonly followed religion, resulting in increased incidence among Hindus.

Out of total 116 burn cases, soot particles were found in trachea in 08(7.0%) cases, which is almost similar with the finding of Mishra PK et al, who found soot particles in 5.55% cases. But different from the findings of Das KC et al, who found soot particles in trachea in 18.05% cases, Nath D et al, who found in 34.07% cases and Mazumdar A et al, who found soot particles intrachea in 19% cases.

In the present study kerosene smell was found evident in 24 (21%) cases. This finding in our study is near to the finding of Mishra PK et al, who observed kerosene smell in 27.5% of cases. Whereas on the contrary Chaudhary BL et al in their study observed smell of kerosene in only 4% cases. This might be due...
to its easy availability and its extensive use in household purposes for cooking and in lighting lamps in the rural areas as there is less availability of cooking gas and electricity in rural areas. Many people use kerosene as a fuel for motor vehicles and it is also a major fuel for aircraft engines.

On the basis of manner of deaths, majority of deaths were accidental in nature i.e. in 78.44% cases followed by suicidal i.e. 15.51% cases. This may be due to involvement of females in domestic cooking. This was responsible for accidental cases and marital maladjustment resulting in suicidal cases. Homicidal deaths are less comparatively i.e. in 6.03% cases and commonly seen in case of dowry killing may be by husband or in-laws. In this study majority of deaths were accidental in nature, which is similar to other studies.6,7,8,13,20

In present study, majority of the victims i.e. 102 (88%) had more than 40% of Total body surface area (TBSA) burn and there are fewer number victims i.e. 14 (12%) below 40% TBSA burn. In studies by Mishra PK et al11 revealed 86.3% mortality over 40% TBSA. Similarly, in studies from Adamo C et al22 revealed 100% mortality over 40% TBSA and Gupta M et al23 also shows similar finding, 80% mortality rate in burn over 40% TBSA. Similar finding were also noticed in study by Mangal HM et al6 showing 92.8% mortality over 40% TBSA burn and Tomar J et al5 shows 100% mortality over 50% TBSA. All these studies signify that burn of 40-50% TBSA and above was fatal resulting in large number of deaths even at tertiary care centre.

In present study upper extremities were most commonly involved in 112 (96.55%) cases, followed by head, neck and face in 105 (90.51%) cases. Similar findings were observed in the study done by Tomar J et al5 with most of the cases involving upper limbs (93.5%), followed by chest and abdomen (86.11%), lower limbs (63.8%) and genitalia (14.81%).

In present study upper extremities were most commonly involved in 112 (96.55%) cases, followed by head, neck and face in 105 (90.51%) cases. Similar findings were observed in the study done by Tomar J et al5 with most of the cases involving upper limbs (93.5%), followed by chest and abdomen (86.11%), lower limbs (63.8%) and genitalia (14.81%). In contrast to the present study, Buchade D et al7 found that Head, face & neck region was most commonly affected in 206 (86.91%) cases, followed by chest in 174 (73.41%) cases.

Conclusion

Our present study and other above discussed studies, shows that married females are commonly affected due to burns because they are commonly involved in domestic cooking work. Most of the burns are accidental and can be prevented by following the safety instructions like putting the lights off while going out, wearing tight and cotton cloths while cooking, not leaving a fire source unattended etc. The government should work in the direction to reduce the incidences of burn by bringing about regulations to develop safer cooking appliances and educating the community especially women on safer first aid practices. The government along with various working groups and the NGOs, including the doctors need to put in more sincere effort. Proper knowledge and training should be given to all the factory workers involve in fire work in order to prevent accidental burn among male and females both. The present study is concluded with the hope that the given suggestions will help in reducing the number of burn injuries.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: It’s a retrospective study and identity of the deceased is nowhere disclosed. Therefore, the approval of Institutional Ethics Committee is not required.

References

5. Tomar J, Mishra PK, Sane MR, Saxena D, Varun A. Epidemiology and Outcome of Burn Injuries- A Prospective study. Indian Journal of Forensic


Profile of Medicolegal Autopsies Conducted at Bundelkhand Medical College, Sagar (M.P.)

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Abstract

Death of humans is often investigated for the causes, in case of crime (such as Murder), accident or disease that may continue to kill other humans. Death occurs due to natural causes or unnatural causes. The study of profile of medicolegal autopsies help us in determining crime rate, accident and common diseases in that particular area and also helpful in preventing unnatural deaths, improving healthcare system and reflecting law and order situation of that area. The present study was based on retrospective analysis of the autopsies performed during the period of January 2018 to December 2018 in the Department of Forensic Medicine and Toxicology, Bundelkhand Medical College, Sagar (M.P). A total of 349 autopsies were conducted during this study period, of which majority of victims were male 195 (56%) cases. Age group of 21-30 years having maximum number i.e. 128 (36.7%) cases. Natural death accounted for 12 (3.4%) cases and unnatural death 323 (92.5%) cases. The major cause of death among unnatural deaths was burn in 116 (33.23%) cases, followed by road traffic accident (RTA) in 106 (30.37%) cases and poisoning in 40 (11.46%) cases. Burn was the major cause of death in our study, this may be due to smoking, defective electrical wiring, defective kerosene stove bursts, attempted suicides by self-immolation, homicidal burns of young women by husband or in-laws (dowry deaths).

Keywords: Burn, RTA, Poisoning, Natural Death, Unnatural death, Homicidal.

Introduction

India is a vast country with great diversities and regional variation among its population in their living, culture, festivals, food habits and other daily livelihood and this regional variation may affect the death trends.¹ So the mortality pattern is different in different region of India. The pattern of mortality is a key indicator of the consequent health effects.²

In our modern society, RTA among males and burn among females are the major causes of death in different regions. NCRB data shows 4,45,514 RTA cases in 2018, of these deaths occurred in 1,52,780 cases. Major cause of death in RTA is due to over speeding (55.2%) followed by careless driving or overtaking (27.3%) during 2018.³ In India, every year 100000 people are moderately or severely injured due to burn injury. An estimated 180 000 deaths every year are caused by burn and among those, vast majority occur in low and middle-income countries.⁴

Autopsy ensures to establish the identity of the body if unknown, to ascertain the time since death and the cause of death, to find out the manner of death, whether it was homicidal, suicidal or accidental. In case of new born infants, the question of live birth, viability and cause of death assume importance and

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should be determined. The objective of present study is to describe the distribution of autopsies on the basis of basic parameter such as age, sex, months, manner of death and cause of death.

**Materials and Methodology**

The present study is a retrospective study carried out in the department of Forensic Medicine & Toxicology, Bundelkhand Medical College, Sagar (M.P). A total of 349 autopsies performed during the period of Jan 2018 to Dec 2018 were analysed. The data was collected from inquest record, medical record and post-mortem reports. Various parameters like age, sex, month, religion, manner and cause of death were taken into consideration. The information was compiled, tabulated and analysed.

**Results**

In a study period of one year, total 349 autopsies were conducted from 1st Jan 2018 to 31st Dec 2018. Out of which, 195 (56%) cases were male and 154 (44%) cases were female having female: male ratio of 1:1.26. (Graph 1).

On the basis of age group, maximum number of males belonged to the age group of 21-30 i.e. 64 (18.33%) cases followed by age group of 31-40 years with 33 (9.45%) cases. In females 21-30 age group had maximum number of cases i.e. 64 (18.33%) cases followed by the 11–20 years age group with 34 (9.74%) cases. Taking overall population into consideration 21-30 years age group had maximum number of cases i.e. 128 (36.7%) cases. Number of males and females were same in the age group of 21-30 years i.e. 64 cases. Female number was dominating over male number in age group of 11-20 years i.e. 34 out of 60 cases and 71-80 years i.e. 02 out of 03 cases. (Table no. 1).

In the present study, maximum autopsies were conducted in month of April with 41 (11.74%) cases, followed by 40 (11.46%) cases in the month of May. Month of November showed the least number of cases i.e. 17 cases (4.87%). Deaths of females were more compared to males in the month of July i.e. 15 out of 28 cases and November i.e. 11 out of 17 cases.  

Out of the total 349 cases, the cause of death was determined in 335 (96%) cases. Out of these 335 cases, in 12 (3.4%) cases the cause of death was natural, whereas in 323 (92.5%) cases it was unnatural. The cause of death could not be determined in 14 (4%) cases. (Figure 2). Out of 323 unnatural deaths, manner of death was accidental in 263 (81.4%) cases, suicidal in 57 (17.6%) cases and homicidal in 03 (1%) cases. (Figure 3).

Distribution of cases according to cause of death showed that maximum number of deaths were due to burn i.e. 116 (33.23%) followed by death due to RTA in 106 (30.37%) cases, poisoning in 40 (11.46%) cases and snakebite in 21 (6.01%) cases. The least number of deaths were observed in case of assault, gunshot, blast injuries and cut throat account for 01 (0.28%) case in each followed by animal attack i.e. 02 (0.57%). Deaths due to asphyxia were in 17 (4.87%) cases which include hanging, strangulation and drowning cases. Deaths due electrocution, fall from height and railway track accident accounted for 08 (2.29%), 05 (1.43%) and 04 (1.14%) cases respectively. In our study deaths due to pathological disease like coronary artery disease, liver and uterine pathology accounted for 12 (3.43%) cases. Nearly in 14 cases, cause of death could not be identified hence cause of death remains open and various sample had been preserved and sent for investigation to find out the actual cause of death. The major cause of death in males was RTA (27.22%) followed by Burn (6.3%) and in females, it was burn (26.93%) followed by poisoning (5.73%). (Table no. 3).
Figure-1: Sex wise distribution of Cases

Figure-2: Distribution of the basis of Cause of Death

Figure-3: Distribution on the basis of Manner of Death
Table 1: Age and sex-wise distribution of cases

<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>No. of cases (%)</th>
<th>Total case (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>Male</td>
<td>09 (2.57)</td>
<td>14 (4.0)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>05 (1.43)</td>
<td></td>
</tr>
<tr>
<td>11-20</td>
<td>Male</td>
<td>26 (7.44)</td>
<td>60 (17.2)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>34 (9.74)</td>
<td></td>
</tr>
<tr>
<td>21-30</td>
<td>Male</td>
<td>64 (18.33)</td>
<td>128 (36.7)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>64 (18.33)</td>
<td></td>
</tr>
<tr>
<td>31-40</td>
<td>Male</td>
<td>33 (9.45)</td>
<td>55 (15.7)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>22 (6.30)</td>
<td></td>
</tr>
<tr>
<td>41-50</td>
<td>Male</td>
<td>29 (8.30)</td>
<td>46 (13.2)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>17 (4.87)</td>
<td></td>
</tr>
<tr>
<td>51-60</td>
<td>Male</td>
<td>16 (4.58)</td>
<td>22 (6.3)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>06 (1.71)</td>
<td></td>
</tr>
<tr>
<td>61-70</td>
<td>Male</td>
<td>12 (3.43)</td>
<td>16 (4.6)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>04 (1.14)</td>
<td></td>
</tr>
<tr>
<td>71-80</td>
<td>Male</td>
<td>01 (0.28)</td>
<td>03 (0.8)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>02 (0.57)</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>Male</td>
<td>05 (1.43)</td>
<td>05 (1.4)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>349</strong></td>
<td><strong>349</strong></td>
</tr>
</tbody>
</table>

Table 2: Month and sex-wise distribution of cases

<table>
<thead>
<tr>
<th>Month</th>
<th>Sex</th>
<th>Total</th>
<th>Total case (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>Male</td>
<td>16</td>
<td>24 (6.87)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>08</td>
<td></td>
</tr>
<tr>
<td>February</td>
<td>Male</td>
<td>20</td>
<td>34 (9.74)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>March</td>
<td>Male</td>
<td>17</td>
<td>36 (10.31)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>April</td>
<td>Male</td>
<td>24</td>
<td>41 (11.74)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>Male</td>
<td>23</td>
<td>40 (11.46)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>June</td>
<td>Male</td>
<td>14</td>
<td>26 (7.44)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>July</td>
<td>Male</td>
<td>13</td>
<td>28 (8.02)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>August</td>
<td>Male</td>
<td>23</td>
<td>36 (10.31)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>September</td>
<td>Male</td>
<td>15</td>
<td>25 (7.16)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Month</th>
<th>Sex</th>
<th>Total</th>
<th>Total case (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>Male</td>
<td>13</td>
<td>23 (6.59)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>November</td>
<td>Male</td>
<td>06</td>
<td>17 (4.87)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>December</td>
<td>Male</td>
<td>11</td>
<td>19 (5.44)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>08</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>349</td>
<td>349</td>
</tr>
</tbody>
</table>

Table 3: Showing distribution on the basis of Causes of Death

<table>
<thead>
<tr>
<th>Causes of Death</th>
<th>No. of Males (%)</th>
<th>No. of Females (%)</th>
<th>Total(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burn</td>
<td>22 (6.30)</td>
<td>94 (26.93)</td>
<td>116 (33.23)</td>
</tr>
<tr>
<td>RTA</td>
<td>95 (27.22)</td>
<td>11 (3.15)</td>
<td>106 (30.37)</td>
</tr>
<tr>
<td>Poisoning</td>
<td>20 (5.73)</td>
<td>20 (5.73)</td>
<td>40 (11.46)</td>
</tr>
<tr>
<td>Snakebite</td>
<td>11 (3.15)</td>
<td>10 (2.86)</td>
<td>21 (6.01)</td>
</tr>
<tr>
<td>Asphyxia</td>
<td>11 (3.15)</td>
<td>06 (1.71)</td>
<td>17 (4.87)</td>
</tr>
<tr>
<td>Pathology</td>
<td>10 (2.86)</td>
<td>02 (0.57)</td>
<td>12 (3.43)</td>
</tr>
<tr>
<td>Electrocution</td>
<td>06 (1.71)</td>
<td>02 (0.57)</td>
<td>08 (2.29)</td>
</tr>
<tr>
<td>Fall From Height</td>
<td>03 (0.85)</td>
<td>02 (0.57)</td>
<td>05 (1.43)</td>
</tr>
<tr>
<td>Train Accidents</td>
<td>01 (0.28)</td>
<td>03 (0.85)</td>
<td>04 (1.14)</td>
</tr>
<tr>
<td>Animal Attack</td>
<td>02 (0.57)</td>
<td>00</td>
<td>02 (0.57)</td>
</tr>
<tr>
<td>Assault</td>
<td>01 (0.28)</td>
<td>00</td>
<td>01 (0.28)</td>
</tr>
<tr>
<td>Gunshot</td>
<td>01 (0.28)</td>
<td>00</td>
<td>01 (0.28)</td>
</tr>
<tr>
<td>Blast Injury</td>
<td>01 (0.28)</td>
<td>00</td>
<td>01 (0.28)</td>
</tr>
<tr>
<td>Cut Throat</td>
<td>01 (0.28)</td>
<td>00</td>
<td>01 (0.28)</td>
</tr>
<tr>
<td>Open</td>
<td>10 (2.86)</td>
<td>04 (1.14)</td>
<td>14 (4.01)</td>
</tr>
<tr>
<td>Total</td>
<td>195 (55.9)</td>
<td>154 (44.1)</td>
<td>349</td>
</tr>
</tbody>
</table>

Discussion

In the present study, out of total 349 autopsy cases, 195(56%) were male and 154(44%) were female. In study by Rathod AL et al[1] and Radhakrishna KV et al[6] similar finding with male predominance were observed, accounted for 69.5% and 74.62% respectively. Similar finding with male predominance were also observed in other such studies.[2,7,8,9,10,11] The reason being that as males are bread earners and females usually do house hold work, which make males more vulnerable to accidents, violence and stress. Males also indulge more in alcoholism, smoking etc than female population which make males more prone to accidents and early natural deaths.

Age group of 21-30 years showed maximum numbers of deaths among both sexes i.e. 128 (36.7%). This finding is also consistent with the studies by Rathod AL et al[1], Radhakrishna KV et al[6] and Bhahbor R et al[7] in which these age group involve 473 cases (27.1%), 340 cases (25.6%) and 257 cases (24.71%) respectively. It’s an adult age group which is mostly involved in most of the activities and hence more vulnerable than other age groups.

In the present study, out of total 323 unnatural deaths, most of the deaths were accidental in nature i.e. 263 (75.35%) followed by suicidal deaths i.e. 57 (17.6%) and homicidal deaths i.e. 03 (1%). This finding is similar in the study conducted by Ramalingam S et
al[8] and Singh D et al [12]. But our findings differ from the findings observed in study conducted at Government Medical College and Hospital, Chandigarh where accidental deaths constitute 49.56%, suicidal deaths constitute 38.55% and homicide deaths constitute 4.44% cases.[13]

In present study, the maximum number of deaths were due to burn (33.23%), followed by RTA (30.37%) and poisoning (11.46%). This finding is similar with the study conducted by Mugadlimath A et al [14] in which major cause of death was burn in 37.5% cases followed by RTA in 22% cases. But unlike our study, RTA was the major cause of death in study by Rathod AL et al[1], Radhakrishna KV et al [6], Bhabhor R et al [7], Ramalingam S et al[8] and Atrey A et al [15]. In our study major cause of death among males was RTA account for 48.71% followed by burn i.e. in 11.28% cases, which is similar with the study conducted by Rathod AL et al [1] and Vinay Kumar M.S. et al [16], in which RTA among males account for 87.4% and 78%. Similar finding also observed in other such studies also. [1,6,7,8,15,17,18,19] This is due to congested and overcrowded roads with an increase in the number of vehicles and poor traffic sense leads to increased number of vehicular accidents. Major cause of death among females was burn in 61.03% cases followed by poisoning in 12.98% cases, this similar finding of burn as a major cause of death among females was also observed in the study conducted by Mugadlimath A et al [14] and Mishra PK et al [20]. This is because they spend most of their time in kitchen and involve in the activities which required fire like cooking food, making tea, boiling water etc.

**Conclusion**

Our study concludes that burn was major cause of death among all deceased in Sagar region of Madhya Pradesh. So, government should work in the direction to reduce the incidence of burn by bringing out regulations to develop safer cooking appliances and educating the community especially women on safer first aid practices etc. RTA was major cause of death among males. So, traffic rule awareness program should be started, motor vehicle driving legislation must be strengthened and reinforced on time to bring down the numbers at the casualty.

Age group of 21-30 years in both males and females were most commonly involved in all death events which shows their vulnerability in meeting the death due to any cause of death. The mortality can be reduced by proper implementation of government policies and traffic rules.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** It’s a retrospective study and identity of the deceased is nowhere disclosed. Therefore, the approval of Institutional Ethics Committee is not required.

**References**


Assessment of the Knowledge and Attitude of Mothers Regarding Oral Hygiene of Under Five Children in Selected Rural Areas of Ambala, Haryana

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Abstract

Oral Health is an important component of general health and to maintain oral health oral hygiene plays a major role. It has also become clear that causative and risk factors in oral diseases are often the same as those implicated in the major general diseases. The objectives of the study were to assess the knowledge and attitude of mothers regarding oral hygiene of under five children, to find out their relationship between knowledge and attitude and to determine the association of knowledge and attitude score of mothers regarding oral hygiene of under five children with selected variables. The research approach adopted for the study was quantitative research approach and design was descriptive research design. The study was conducted at selected rural areas of Ambala, Haryana. A total of 200 mothers having under five children were selected by using purposive sampling technique. The tool used for the data collection consisted of Selected Variables and knowledge questionnaire to measure knowledge of under-five mothers. The Reliability of the tool was calculated by Cronbach’s alpha and it was 0.81 for rating scale. Themajor findings revealed that mean of knowledge score was 19.1 and mean of attitude score was 60.9 in the study. There was a significant association found between the level of knowledge and demographic variables i.e. type of family (p=0.00), Have dental problem before (p=0.03), Method used for oral hygiene (p=0.00) and concerned about oral health (p=0.00) in the present study. Hence,It was concluded from the study that the mothers have good knowledge and positive attitude regarding oral hygiene of under five children

Keywords: Oral hygiene, Knowledge, Attitude, Under five children.

Introduction

“Even pearls are dark before the whiteness of his teeth.”

Dental carries is infectious disease and mother is the major primary source of infection for their children. Children under the age of 5 years generally spend most of their time with parents and guardians, especially mothers, even when they attend pre-school or nurseries. Poor attitude of parents towards oral health of infants and young children are associated with increase caries prevalence¹.

India, a developing country, faces many challenges in render in oral health needs. The majority of Indian population resides in rural areas of which more than 40% constitute children. This main aim of this study is imparting oral health education to mothers regarding
oral hygiene of their under-five children who belong to the socio-economically disadvantaged.\(^2\)

The parent’s belief toward children’s oral health plays an important role to improve their children’s oral health. In spite of the fact that early childhood caries has been widely studied and preventive programs implemented in certain countries, early childhood caries is more commonly seen in socially disadvantaged groups, who are lacking of health care systems. Hence, it is essential to assess the knowledge, attitude and practices about their children’s oral health which will help the health providers to understand the reasons for development of oral diseases in children and failure to get them treated\(^2\).

Good oral hygiene has been promoting oral health and preventing oral diseases like periodontal disorders and dental caries and justifying the slogan that “A clean tooth never decays.” Poor oral hygiene practices are an important factor among the causes of periodontal disorders. Moreover the failure of removing plaque and debris that is, not maintaining good oral hygiene and it has been one of the major etiological factors for the initiation of dental caries. Hence, the importance of oral hygiene against diseases like periodontal disorders and dental caries is quite evident\(^3\).

Aims and Objectives

1. To assess the knowledge of mothers regarding oral hygiene of under five children.
2. To assess the attitude of mothers regarding oral hygiene of under five children.
3. To find out the relationship between knowledge and attitude of mothers regarding oral hygiene of under five children.
4. To determine the association of knowledge and attitude score of mothers of regarding oral hygiene of under five children with selected variables.

Methodology

The study was conducted during the month of February-march 2019 at selected rural areas of Ambala, Haryana India. A sample of 200 mothers of under five children participated in this study with the prior permission. The ethical clearance was obtained from the sarpanch of the respective villages. A written consent was obtained from the mothers of under five children who were enrolled in the study. Quantitative research approach with Non Experimental Descriptive survey design was used in this study. The study includes the mothers who were having under five children and willing to take part in the study. A total of 200 participants were enrolled for the study by using Purposive sampling Technique. Data was collected by using Sample Characteristics, Structured Knowledge questionnaire and Structured Attitude Scale.

Description of Tool

**Section-I: Sample Characteristics:** It consist of items regarding the selected Sample Characteristics. The selected Sample Characteristics include Age, Number of children, Type of family, Education of mother, Education of father, Occupation of mother, Occupation of father, Distance to nearby health facility, Have dental problem before, Dental problem is a major health issue, Method used for oral hygiene, Concerned about oral health, Main source of oral health information and Socio Economic Status.

**Section-II: Structured Knowledge Questionnaire to assess Knowledge of Mothers of under five children:** A structured questionnaire was develop to assess the knowledge of mothers regarding oral hygiene of under five children. It consist of 35 multiple choice questions.

**Section III: Description of Attitude Scale Questionnaire:** The standardized tool was used to assess the attitude scale of mother’s regarding oral hygiene of under five children. The tool was used on the basis of previous research evidences, based on extensive review of literature and seeking opinion of experts and guides. It consist of 25 items in which 13 items were Positive and 12 items were Negative.

**Procedure:** The permission was taken to conduct the study from the Respective Villages of Ambala, Haryana. The Consent was taken from the participants prior to the study. The sample Characteristics, Structured Knowledge Questionnaire and Structured Attitude Scale Questionnaire was administered to Mothers. To obtain a free and frank response, the participants were assured about their confidentiality of their response. Purpose of the study was explained to sample subjects before data collection. It was found that it took 20 minutes to complete the questionnaire. The items were found clear and understandable.
Results

Section-I: Frequency and percentage distribution in terms of level of knowledge and attitude of mothers regarding oral hygiene of under five children as given in table 1 and table 2

Table 1: Frequency and Percentage Distribution in terms of level of Knowledge of Mothers regarding Oral Hygiene of under Five Children. N=200

<table>
<thead>
<tr>
<th>Level of Knowledge</th>
<th>Range of scores</th>
<th>Frequency</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>27-35</td>
<td>29</td>
<td>14.5</td>
</tr>
<tr>
<td>Good</td>
<td>18-26</td>
<td>93</td>
<td>46.5</td>
</tr>
<tr>
<td>Average</td>
<td>9-17</td>
<td>70</td>
<td>35</td>
</tr>
<tr>
<td>Poor</td>
<td>&lt;9</td>
<td>8</td>
<td>4</td>
</tr>
</tbody>
</table>

Data presented in the table 1 depicts that 46.5% of mothers had Good knowledge regarding oral hygiene of under five children. Whereas 14.5% of mothers had excellent knowledge 35% and 4% of mothers had Average and poor knowledge respectively.

Table 2: Frequency and Percentage in Terms of Attitude of Mothers Regarding Oral Hygiene of Under Five Children. N=200

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Score</th>
<th>Frequency</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Favorable</td>
<td>&gt;84</td>
<td>9</td>
<td>4.5</td>
</tr>
<tr>
<td>Moderately Favorable</td>
<td>41-84</td>
<td>181</td>
<td>90.5</td>
</tr>
<tr>
<td>Unfavorable</td>
<td>&lt;41</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

Data presented in table 2 shows that 90.5% of mothers had moderately favorable attitude towards oral hygiene of under five children while 5% of mothers had unfavorable attitude and 4.5% of mothers had favorable attitude towards oral hygiene of under five children.

Section-II: Range, Mean, median and standard deviation of knowledge and Attitude scores of mothers regarding oral hygiene of under five children as given in table 3.

Table 3: Range, Mean, Median and Standard Deviation of Knowledge Scores of Mothers Regarding Oral Hygiene of Under Five Children. N=200

<table>
<thead>
<tr>
<th>Test</th>
<th>Mean± S.D.</th>
<th>Range</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>1.91±6.10</td>
<td>28</td>
<td>1.8</td>
</tr>
<tr>
<td>Attitude</td>
<td>6.09±10.07</td>
<td>66</td>
<td>6</td>
</tr>
</tbody>
</table>

Section-III: Coefficient of correlation between the knowledge and attitude of mothers regarding oral hygiene of under five children as given in table 4.

Table 4: Coefficient of Correlation between the Knowledge and Attitude of Mothers Regarding Oral Hygiene of Under Five Children. N=200

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>1.91</td>
<td>6.10</td>
<td>0.06*</td>
</tr>
<tr>
<td>Attitude</td>
<td>6.09</td>
<td>10.07</td>
<td></td>
</tr>
</tbody>
</table>

Table 4 depicts that r value 0.06 which was found to be significant at 0.05 level of significant. Thus there was a positive relationship between knowledge and attitude of mothers regarding oral hygiene of under five children.

Section-IV: Association between the level of knowledge and attitude of mothers regarding oral hygiene of under five children with the selected demographic variables showed there was significant association of knowledge score with type of family with p values (0.00*), education of mother (0.00*), Education of father (0.01*), Occupation of Mother (0.02*), Occupation of Father (0.00*), have a dental problem before (0.03*), method used for oral hygiene (0.00*), concerned about oral health (0.00*), main source of oral health information (0.00*) and there was significant association of Attitude Scale with age of Mother (0.03*), Type of family (0.00*), Education of Mother (0.01*), Occupation of Father (0.00*), Distance to nearby health facility (0.00*), Visit to dentist (0.02*), Have a dental problem (0.01*), Dental problem is a major health issue (0.00*), Concerned about oral health (0.00*) and main source of oral health (0.05*).

Discussion

The present study was conducted to assess the knowledge and attitude regarding oral hygiene among mothers of under five children.

Findings of the present study indicated that 46.5% of mothers had good knowledge regarding oral hygiene of under five children. These findings are consistent with the study conducted by Suresh BS, Ravi Shankar TL, Chaitra TR, Mohaptra AK, Gupta V to assess the mother’s knowledge about preschool child’s oral health, which revealed that mothers had (73.8%) good knowledge regarding oral hygiene.

Findings also revealed that the 90.5% of mothers...
of under five children had moderately favorable attitude towards oral hygiene of under five children. These findings are consistent with the findings of the study conducted by Moallemi, Z., Virtanen, J., Ghofranipour, F. and Murtomaa, H. (2008) to assess the influence of mothers’ oral health knowledge and attitudes on their children’s dental health, which revealed that mothers had (92%) positive attitude regarding oral hygiene5.

**Conclusion**

The finding of the study shown that mothers of under five children have average knowledge and had moderately favorable attitude regarding oral hygiene. There is negative correlation between the knowledge and attitude of mothers regarding oral hygiene of under five children.

**Ethical Clearance:** The permission was obtained from the sarpanch of the respective villages and written consent from the mothers of Under five Children.

**Conflict of Interest:** Nil

**Financing Sources:** Nil

**References**


Load of Firearm Cases in Male at SMS Medical College, Jaipur

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Abstract

Introduction: A Firearm is a thermodynamic machine in which the potential energy of the gun-powder is transformed into the kinetic energy of the projectile.

Aims and Objective: To assess the load and analyze the male cases of firearm injuries.

Material and Methodology: The present prospective study had been conducted in the Department of Forensic Medicine, SMS Medical College & Hospital, Jaipur, Rajasthan during the period of One & half year from May 2014 to October 2015. All cases of firearm injuries that were received dead or live at SMS Hospital and its attached Hospitals, Jaipur was included in our study.

Result and Observation: In our study majority of firearm injury case [43 cases (40.78%)] were observed in the age group of 20-29 years followed by the age group of 30-39 years [28 cases (27.18%)]. Majority of the incidences of gun-shot injuries were homicidal in nature (80.58%) followed by accidental episodes (14.56%). Land and property disputes were the most common reason behind firearm injuries in this study (42.72%) followed by revenge & robbery (15.53% & 13.59 % respectively); Majority of the incidences occurred during evening in 43 cases (41.75%), followed by afternoon 40 cases (38.83%). There was presence of firearm entry wound in all victims. Overall, 52 cases (50.49%) had a single entrance wound, 13 cases(12.62%) had two entry wounds, In summer season 43 cases (41.75%), spring 24 cases (23.30%), winter 20 cases (19.42%), autumn 16 cases (15.53%), were reported in studied cases. In majority of the cases (81.55%), there was no exit wounds while one exit wound was found in 17 cases (16.51%). In rest of the two cases, two exit were found in two cases.

Conclusion: The results of the present study support the argument that rigorous pursuit of campaign firearms without a license and country made guns may prove useful in reducing the number of firearm injuries in society.

Keyword: Firearm Injury, Male, Prospective study, Jaipur.

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Introduction

A Firearm is a thermodynamic machine in which the potential energy of the gun-powder is transformed into the kinetic energy of the projectile\textsuperscript{1}.

Firearms and explosives constitute convenient means of destroying human life from considerable distance, providing opportunity to the offender to escape;
it has been the weapon of choice for gangsters, terrorists, extremists, antisocial and anti-national elements for eliminating their victims. Its use is increasing in recent years because of easy availability due to manufacture of huge amount of arms, ammunition and explosives and free smuggling across the international borders 2.

Data on firearm injury in a particular geographic area can also give the reflection of its law and order situation. A low value can be described in favour of peace, harmony and security to human life 3.

There is growing concern about the indiscriminate use of firearms on a large scale, particularly in the last decade. The availability of firearms known as small arms and light weapons (SALW) has been described as a cancer spreading across the developing world 4.

This study was thus undertaken to assess the load of gun-shot injuries among in Jaipur region and to ascertain the medico-legal and socio-demographic profile of cases presented at SMS Medical College, Jaipur during the study period along with associated deaths in Jaipur region to look for reason behind them; and also to suggest few recommendations which may prove useful in bringing down the toll of firearm injuries in this region.

Aims and Objectives:

To assess the load and analyze the cases of firearm injuries and associated deaths reported at the Department of Forensic Medicine, SMS Hospital, Jaipur during the study period (May, 2014 to October, 2015).

To study the load of firearm injuries and associated deaths reported at the Department of Forensic Medicine during the study period.

To study the medico-legal profile of firearm injuries.

To study the socio-demographic profile of victims of firearm injuries.

Material and Methodology

All the cases of firearm injuries, irrespective of age, gender and socioeconomic status received at the casualty of SMS Hospital, Jaipur, dead or alive, later admitted to various wards of SMS Hospital, Jaipur were included in the study. All cases of firearm injuries that were received dead at SMS Hospital and its attached Hospitals, Jaipur was autopsied at the mortuary of SMS Hospital, Jaipur and included in the study. Also the cases of non fatal firearm injuries admitted to various wards of SMS Hospital and its attached hospitals, Jaipur were included in the study after receiving an informed consent for the same. All the observations were recorded in the pre proposed Performa as detailed above. The results of the present study were further compared to other contemporary studies from various parts of the country.

Observations and Result

Table 1: Age and Sex Wise Distribution of Firearm Injuries Cases.

<table>
<thead>
<tr>
<th>Age group (in yrs)</th>
<th>Total no. of cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10</td>
<td>01</td>
<td>0.97</td>
</tr>
<tr>
<td>10-19</td>
<td>08</td>
<td>7.77</td>
</tr>
<tr>
<td>20-29</td>
<td>42</td>
<td>40.78</td>
</tr>
<tr>
<td>30-39</td>
<td>28</td>
<td>27.18</td>
</tr>
<tr>
<td>40-49</td>
<td>13</td>
<td>12.62</td>
</tr>
<tr>
<td>50-59</td>
<td>09</td>
<td>8.74</td>
</tr>
<tr>
<td>&gt;60</td>
<td>02</td>
<td>1.94</td>
</tr>
<tr>
<td>Total</td>
<td>103</td>
<td>100</td>
</tr>
</tbody>
</table>

Out of 103 cases, majority of the cases were in the age group of 20-49 years [(42 cases (80.58%)] which is productive age group of society. Among these, maximum cases were in the age group of 20-29 years which comprised about 40.78% of total cases. The other age groups affected in descending order were the 4th, 5th, 6th and 2nd decades. The least affected age groups with only 2 cases and 1 case below 10 years and above 60 years respectively.

Table 2: Manner Wise Distribution of Firearm Injuries Cases.

<table>
<thead>
<tr>
<th>Manner</th>
<th>Total no. of cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Homicidal case</td>
<td>83</td>
<td>80.58</td>
</tr>
<tr>
<td>No. of Accidental case</td>
<td>15</td>
<td>14.56</td>
</tr>
<tr>
<td>Unknown cases</td>
<td>3</td>
<td>2.91</td>
</tr>
<tr>
<td>No. of Suicidal case</td>
<td>2</td>
<td>1.94</td>
</tr>
<tr>
<td>Total no. of cases</td>
<td>103</td>
<td>100</td>
</tr>
</tbody>
</table>

Homicides (80.58%) were the most common manner of firearm injuries in the present study followed by 15 cases (14.56%) accidental and 02 cases (1.94%) suicidal firearm injuries. The manner remained undetermined in 03 cases (2.91%).
Table 3: Motive Behind the Incidence Wise Distribution of Firearm Injuries Cases.

<table>
<thead>
<tr>
<th>Motive behind incidence</th>
<th>Total no. of cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property disputes</td>
<td>44</td>
<td>42.72</td>
</tr>
<tr>
<td>Revenge</td>
<td>16</td>
<td>15.53</td>
</tr>
<tr>
<td>Robbery</td>
<td>14</td>
<td>13.59</td>
</tr>
<tr>
<td>Unknown</td>
<td>09</td>
<td>8.74</td>
</tr>
<tr>
<td>Accidental (no motive)</td>
<td>09</td>
<td>8.74</td>
</tr>
<tr>
<td>Group Quarrel</td>
<td>05</td>
<td>4.85</td>
</tr>
<tr>
<td>Love Affair</td>
<td>03</td>
<td>2.91</td>
</tr>
<tr>
<td>Defence</td>
<td>03</td>
<td>2.91</td>
</tr>
<tr>
<td>Grand Total</td>
<td>103</td>
<td>100</td>
</tr>
</tbody>
</table>

Land and property disputes were the most common reason behind firearm injuries in this study (42.72%) followed by revenge & robbery (15.53% & 13.59 % respectively); group quarrel accounted for another 5 cases(4.85%) and there were 03 cases each (2.91%) for defense and love matters/sexual jealousy. In 9 cases (8.74%), the motive remained undetermined.

Table 4: Time of Incidence Wise Distribution of Firearm Injuries Cases.

<table>
<thead>
<tr>
<th>Day of Incidence</th>
<th>Total no. of cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evening</td>
<td>43</td>
<td>41.75</td>
</tr>
<tr>
<td>Afternoon</td>
<td>40</td>
<td>38.83</td>
</tr>
<tr>
<td>Morning</td>
<td>9</td>
<td>8.74</td>
</tr>
<tr>
<td>Night</td>
<td>10</td>
<td>9.71</td>
</tr>
<tr>
<td>Unknown</td>
<td>01</td>
<td>0.97</td>
</tr>
<tr>
<td>Total</td>
<td>103</td>
<td>100</td>
</tr>
</tbody>
</table>

Majority of the incidences occurred during evening in 43 cases (41.75%), followed by afternoon 40 cases (38.83%), night 10 cases (9.71%) & morning 9 cases (8.74%) The time of incidence remained undetermined in a single case (0.97%).

Table 5: Season of Incidence Wise Distribution of Firearm Injuries Cases.

<table>
<thead>
<tr>
<th>Season of incidence</th>
<th>Total no. of cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>43</td>
<td>41.75</td>
</tr>
<tr>
<td>Spring</td>
<td>24</td>
<td>23.30</td>
</tr>
<tr>
<td>Winter</td>
<td>20</td>
<td>19.42</td>
</tr>
<tr>
<td>Autumn</td>
<td>16</td>
<td>15.53</td>
</tr>
<tr>
<td>Total</td>
<td>103</td>
<td>100</td>
</tr>
</tbody>
</table>

In summer season 43 cases (41.75%), spring 24 cases (23.30%), winter 20 cases(19.42%), autumn 16cases (15.53%), were reported in studied cases. Maximum were in summer and least in autumn.

Table 6: Number of Exit Wounds in Gun-Shot Injuries Wise Distribution of Firearm Injuries Cases.

<table>
<thead>
<tr>
<th>Number of Exit wounds</th>
<th>Total no. of cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>84</td>
<td>81.55</td>
</tr>
<tr>
<td>One</td>
<td>17</td>
<td>16.51</td>
</tr>
<tr>
<td>Two</td>
<td>02</td>
<td>1.94</td>
</tr>
<tr>
<td>Total</td>
<td>103</td>
<td>100</td>
</tr>
</tbody>
</table>

In majority of the cases [84 cases (81.55%)], there were no exit wounds while one exit wound was found in 17 cases (16.51%). In rest of the two cases, two exit wound were found in two cases.

Discussion

Maximum numbers of cases were from 20-39 years of age (67.96%) with peak incidence in 20-29 years (40.78%) which are the productive and active members of the society. The observations of the present study were similar to those of Patowary AJ et al., Sachan R et al, Kumar K et al (peak incidence between 21-40 years of age in all). However, the results of the present study are variable from those of Kumari S et al with majority number of cases in 11-20 years followed by 21-30 years. The probable reason for this variation is the minor cultural and periodical differences as most other studies from the same state also report the highest incidences of such cases between 21-40 years.

Homicides [83 cases (80.58%)] were the most common manner of firearm injuries in the present study followed by 15 cases (14.56%) accidental and 02 cases (1.94%) suicidal firearm injuries. The manner remained undetermined in 03 cases (2.91%). Homicidal intent was predominant in most other studies Sachan R et al, Kumar K et al and Kumari S et al. Other studies have considered either only homicidal Patowary AJ et al or suicidal firearm injuries. The preponderance of homicide in gun-shot injuries is explainable as these deadly weapons are generally used in planned manner or more so impulsively in a planned assault. It is not very easy to procure such weapons and not that very easy to carry it due to legal restraints, so, they are not
the weapon of choice in fights and assaults. They are mostly used in planned episodes of homicidal or suicidal injuries. Accidental injuries with firearms are also not uncommon as users are prone to such episodes while cleaning, maintenance or erratic handling of loaded guns. Accidental injuries were seen in this study in 16.52% cases but these results are quite high as compared to studies of Kumar K et al and Kumari S et al.

Land and property disputes were the most common reason behind firearm injuries in this study [44 cases (42.72%)] followed by revenge 16 cases (15.53%) & robbery 14 cases (13.59%); group quarrel accounted for another 5 cases (4.85%) and there were 03 cases each (2.91%) for defense and love matters/sexual jealousy. In 9 cases (8.74%), the motive remained undetermined. As per Kumar K et al the motive remained undetermined in a single case of accidental firing (1.73%). This difference is attributable to the variation in the proportion of accidental incidences in the two studies. There were 10 cases of purely accidental gun-shot injuries where motive was lacking. According to Patowary AJ et al, most cases were due to militant activities, encounters, riots, robberies or family quarrel. This variation from our study is due to the regional variations in the areas of study as Guwahati and Imphal are militant activity prone areas. The results of the present study are quite similar to those of Sachan R et al. But, in slight variation with Kumar K et al where maximum homicides occurred for personal enmity. The motives behind the homicidal attack with firearm weapons were well represented in different cases with property land disputes majorly responsible followed by personal enmity and robbery.

Most of the events of firearm injuries occurred during evening hours (41.75%) followed by afternoon (38.83%). These are the hours of work and business, thus prone to activity during which the untoward event took place. 8.74% incidences took place in morning hours. Thus, it was observed that in 47.57% cases, the incidence took place in broad daylight and 52.43% cases occurred after sunset; as also reported by Kumar K et al. The late night hours witnessed the least numbers of gun-shot injuries (8.7%) in the present study which is in contrast to the findings of Kumari S et al. The suicides (two cases) were committed in morning and evening each.

None of the season was poorly represented by episodes of firearm injuries and deaths. However, summer season was most flooded with events of firearm injuries in the present study (41.75%) followed by spring (23.30%) and winter (19.42%). This is quite explainable as maximum events in this study took place for land disputes in villages. Summer season is a comparatively relaxing one for those engaged in Agriculture as the main crop of this region is through by the end of spring. After the harvest of the crop, the disputes probably come to surface owing to distribution of revenue generated.

Exit wounds were present in only 84 cases (18.26%) i.e. in majority of the victims, firearm exit wounds were not present. These are quite less in number due to the predominance of distant fires in this study. In the present study, a single exit wound was found in 17 cases (16.51%) and in 2 cases (1.74%) there were two exit wounds. These results are quite low in comparison to those of Kumar R et al and, Kumari S et al who reported presence of exit wounds in 61.36% & 60% victims respectively.

**Conclusion**

This study indicated that the most common victims of firearm injuries were young males of bread earning age followed by youth which raises concern towards this issue. Certain changes may minimize mortality and disability due to firearm injuries, also reducing the costs to the community. As a result of the invention of more advanced firearms and availability at the global level, death rates due to firearm injuries have increased recently. There is a powerful correlation between acquisition of a firearm and its use in murders, suicides and unintentional deaths. So, there is a need to decrease the number of firearms used and sold in India.

The results of the present study support the argument that rigorous pursuit of campaign firearms without a license and country made guns may prove useful in reducing the number of firearm injuries in society. Educational efforts and individual, community and societal approaches are needed to alleviate firearm related injuries.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**Acknowledgement:** Nil

**Ethical Clearance:** It is taken from Ethical committee of SMS Medical College, Jaipur before starting of study.
Reference


4. Patowary A. Study of pattern of injuries in homicidal firearm injury cases. JIAFM 2005; 27(2):92-95


Epitopes Prediction of PfEMP1-DBL2β Recombinant Protein from Indonesian Plasmodium Falciparum Isolate for Malaria Vaccine Development

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Abstract

The development of an effective vaccine against malaria is essential. Domain Duffy-binding-like (DBL)2β in Plasmodium falciparum erythrocyte membrane protein 1 (PfEMP1) protein is one of the vaccine candidate proteins because of its binding capacity to ICAM-1 receptor. However, the high polymorphism needs epitope identification before formulating a peptide-based vaccine. This study aimed to identify the conserved epitopes in PfEMP1-DBL2β by an immunoinformatic approach. The protein sequences were analyzed to predict the hydrophobicity attributes, T-cell and B-cell epitopes. T-cell epitopes were identified using the NetCTL and Propred server and analyzed for population coverage rate using the IEDB analysis tool. Moreover, the Bepipred 2.0 and Kolaskar Tangaonkar method combined with the K-means clustering were used to predict the B-cell epitopes. This study found that the hydrophobicity value of PfEMP1-DBL2β recombinant protein is 32.62, indicating that this protein is soluble and potentially fit into HLA alleles active site. Two conserved antigenic CTL epitopes with near 90% population coverage rate in the malaria target population were identified. For Th cell epitopes, the NN-align algorithm showed no overlapping strong binding epitope positions for three chosen Indonesian and African alleles. Three B-cell conserved epitopes were identified at the position of 77-89, 236-254 and 360-377 amino acids with one cluster overlapping with ICAM-1 determinant binding area. The predicted conserved epitopes within the protein in this study are valuable in constructing a subunit peptide-based malaria vaccine candidate. A further experimental study is needed to validate this approach as the next step in vaccine development.

Keywords: DBL2β, epitope, immunoinformatic, malaria, PfEMP1.

Introduction

Malaria is one of the most important infectious diseases; it is responsible for 400,000 deaths each year worldwide. Indonesia is one of the countries that have more than 100,000 increasing cases in 2017(1). WHO has several strategies and recommendations to control malaria. A vaccination is considered a great and effective solution as a prophylactic treatment for infectious disease, especially for severe malaria-causing high morbidity and mortality (2).

Pathology of severe malaria involves aggregation and adhesion in microvascular of vital organs called cytoadherence. This mechanism reduces and further obstructs blood flow resulting in organ failure. Besides, cytoadherence can contribute to immune evasion mechanisms causing the spleen’s inability to destroy the infected erythrocyte(3). The cytoadherence is mediated
by Plasmodium falciparum erythrocyte membrane protein-1 (PfEMP1), a protein expressed by the parasite and deposited on the surface of infected erythrocyte which can bind to various host cell receptors. PfEMP1 is a complex protein and consists of several domains, one of them is the Duffy-binding-like (DBL)2β domain that has an affinity toward Intercellular Adhesion Molecule-1 (ICAM-1) receptor found in endothelial cell of microvasculature including the brain(4).

The adhesion of PfEMP1 domains to several host receptors plays an essential role in mediating severe malaria pathogenesis, thus makes this protein as a target in developing the peptide-based vaccine. However, the complexity of the parasite’s life cycle, high antigenic switching rate and immune evasion ability of the parasites are the major problems(5).

The development of the current vaccine is focusing on the discovery of subunit epitope-based vaccines that incorporate one or more semi-purified or even purified antigens. To develop a subunit vaccine, determine the immunological properties of the target protein in generating protection is critical since some peptides may be immunosuppressive or even enhance the disease. Peptides associated with protective epitopes are preferable vaccine candidates, but testing out every peptide as an epitope for their ability to generate protective immune response has several limitations. Aside from time and labor consuming, most peptides expressed during in vivo infection is not expressed the same during in vitro cultivation. Analyzing every individual peptide that is abundant in cultivation also ineffective and difficult(6).

Due to these problems, the immunoinformatics approach has been utilized to identify subunit vaccine candidates from bacterial, viral and parasite genome sequences. This approach called reverse vaccinology works by analyze the genome sequence in silico and predict the feasible peptide with the ability to act as an epitope and thus have the protective capacity(7).

Method

Analysis of protein hydrophobicity: The amino acid sequences of PfEMP1-DBL2β protein from Indonesian isolate cloned by Sulistyaningsih (9), which was deposited at the NCBI (https://www.ncbi.nlm.nih.gov/) with the accession number AGJ83325.1 were retrieved and subjected to check its hydrophobic attribute by using Peptide Property Calculator Program (http://www.biosyn.com/PeptidePropertyCalculator/PeptidePropertyCalculator.aspx).

T-Cell Epitopes Prediction for MHC I and MHC II: The binding of antigen to major histocompatibility complex (MHC) molecules possess a significant role in determining whether an antigen is immunogenic or not. Prediction of the T-cell epitope in developing a subunit vaccine can diminish the experimental step to identify the suitable epitopes in vaccine design. In this study, T-cell epitope prediction for MHC I was done by using NetCTL (http://www.cbs.dtu.dk/services/NetCTL/), an online server for predicting epitopes of human cytotoxic T lymphocyte (CTL) based on protein sequence input. The epitope prediction was conducted by combining the prediction of MHC Class I affinity, TAP transport efficiency and proteasomal cleavage for 12 MHC I supertypes. This tool has better predictive performance compared to several other tools in large scale data(11).

T-cell epitopes prediction tool used in this study was the Vaxijen 2.0 online antigen prediction (http://www.ddg-pharmfac.
This server was developed to predict protective antigens from several hosts and capable of classifying antigen based on its physicochemical properties, resulting in an antigen probability report for each protein. With the threshold set on 0.5, this prediction server can perform with an accuracy of 87%\(^1\). T-cell epitopes for MHC I alleles with the highest probability as a protective antigen were subjected to conservancy analysis with IEDB tools (http://www.iedb.org/) with a 100% threshold compared with Pf11_0521 sequences (accession number XP_001348176.1) and analyzed for its coverage within-population by keeping the parameters on default. The population coverage analysis resource tool determines the ratio of individuals predicted to react toward a given set of epitopes.

Major histocompatibility class II (MHC Class II) is another major part in initiating an immune response. This molecule is normally found on antigen-presenting cells (APC) to present antigens derived from extracellular protein. Because MHC Class II interacts with other immune cells such as lymphocyte T helper cell (CD4\(^+\)), identifying peptide that have an affinity with this molecule is important in vaccine design. Prediction of the binding peptide with MHC Class II was completed by using ProPred (https://webs.iiitd.edu.in/raghava/propred/), an online server to predict antigenic epitopes for 51 HLA Class II alleles based on the amino acid coefficient table. This server can locate the promiscuous binding region from the input protein. The default threshold was put on 3% to limit false-positive results\(^1\). The affinity values for the predicted promiscuous peptides were evaluated using several tools available in the IEDB server. The NN-align algorithm was chosen due to its better predictive performance than other method for HLA-DR peptide binding prediction, such as SMM-align and NetMHCIIpan\(^1\). The predicted peptides were analyzed against three HLA-DR alleles from the malaria target population (Indonesian, East Africa and West Africa) chosen from Allele Frequency Net Database (http://www.allelefrequencies.net/default.asp) and the affinity was showed as IC50 values.

**Explanation:** Antigenicity score, as predicted by VaxiJen 2.0 server ≥0.5, showed that the peptides were classified as an antigen and able to induce host immune response.

<table>
<thead>
<tr>
<th>T-cell Epitope Sequences</th>
<th>Amino Acid Position</th>
<th>Antigenicity Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>YIPQRLRWM</td>
<td>219-227</td>
<td>1.2417</td>
</tr>
<tr>
<td>WMTEWAEWY</td>
<td>226-240</td>
<td>0.7684</td>
</tr>
</tbody>
</table>

**Research Findings:**

**Hydrophobicity Attribute Analysis:** The PfEMP1-DBL2\(^\beta\) protein was subjected to measure the hydrophobicity attribute by using the Peptide Property Calculator program. Protein with hydrophobicity <50% is soluble in aqueous solution, while hydrophobicity >50% is considered partially soluble or insoluble. The more soluble in the aqueous phase, the bigger the probability of the protein to fit into MHC molecules active site cleft\(^8\). Based on the Peptide property calculator program, the hydrophobicity value of PfEMP1-DBL2\(^\beta\) protein was 32.62, indicated that this protein is fully soluble in the aqueous phase.

**T-Cell Epitopes Prediction:** NetCTL prediction tool showed a total of 137 epitope sequences reacting with 12 MHC I alleles supertypes, with 31 sequences reacted with multiple supertypes (Supplementary Table 1). Each epitope sequence was analyzed for the antigenicity using VaxiJen 2.0 server, showing antigen probability classification. IEDB conservancy analysis tool further analyzes conserved sequences compared with Pf11_0521, a PfEMP1 protein isolated from Tanzania children. Two conserved T-cell epitopes from MHC I were generated, as listed in Table 1. Both conserved sequences met the criteria of the default threshold level in VaxiJen 2.0, which is ≥0.5.

**Identification of B cell epitope clusters:** The B cell epitopes within PfEMP1-DBL2\(^\beta\) were identified using two method, i.e., Bepipred 2.0 and Kolaskar-Tangaonkar method in the IEDB server. Both method were chosen because of their accuracy. The Bepipred 2.0 is the latest epitope predictor that identify epitopes from peptide crystal structures. It was presumed to give higher quality prediction than other available tools\(^16\). Moreover, the Kolaskar-Tangaonkar method uses the physicochemical properties of amino acid and their frequencies of occurrence to predict protein antigenic determination\(^17\). With default parameters, both method gave antigenicity scores as a result, which is categorized using the K-means clustering method and depicted in a heat map showed epitope densities of the amino acid sequence.
Population Coverage Analysis of MHC I Epitopes: Highly polymorphic MHC molecules remains a challenge for researchers in developing an effective vaccine. The high number of HLA allelic sequences identified were showed as a widely varying binding specificity of MHC molecules and expressed at different frequencies in different ethnicities. Because malaria is endemic to only several populations, choosing the suitable peptides that reacting with the most expressed MHC alleles in target populations is necessary for rational vaccine design.

IEDB population coverage analysis tool calculates the percentage of individuals predicted to react with a given set of epitopes. Two conserved epitopes of MHC I molecules exhibited different coverage rates in several different populations known as the malaria-endemic area, as depicted in Figure 1.

![Figure 1: Predicted Population Coverage Rate (%) of two conserved MHC I epitopes (YIPQRLRWM and WMTEWAEWY) of DBL2β-PfEMP1 recombinant protein Indonesian isolate in the malaria target population.](image)

For epitope prediction based on its affinity with MHC II alleles, the Propred prediction generated 31 epitope sequences that act as promiscuous peptides (Supplementary Table 2). In the same manner with epitope prediction for MHC I allele, Vaxijen 2.0 server was used to analyze the antigenicity score and classify each peptide into an antigen and non-antigen, resulted in 17 epitope sequences predicted as antigen.

The prediction analysis of T cell epitopes affinity toward the MHC II allele used the NN-align algorithm in IEDB\(^{(15)}\). The IC50 values distribution between each amino acid position was presented in Figure 2. Epitopes with scores lower than 50 nm were considered as strong binders, 50-500 nM as intermediate binders and >500 nM as weak binders. Figure 2 also showed that the strong binding amino acid positions are different among the three target population HLA-DR alleles chosen in this study.
**B cell epitopes prediction in PfEMP1-DBL2β protein:** Two techniques performed determination of the B cell epitopes presence in PfEMP1-DBL2β protein, i.e., the Bepipred 2.0 algorithm\(^{(16)}\) and Kolaskar-Tangaonkar method\(^{(17)}\). Subsequently, the antigenicity scores and epitope density regions on each amino acids were used as a variable in the K-means clustering method to generate a heat map showed in Fig 3. This method has been used to differentiate regions with a higher concentration of epitopes\(^{(18)}\).
Figure 3: A heat map depicted the distribution of epitope dense regions throughout the DBL2β-PfEMP1 amino acid sequence. The regions were determined based on Bepipred 2.0 algorithm and Kolaskar-Tangaonkar method, clustered by the K-means method. Each amino acid categorized into high, medium, low and non-epitope based on its antigenicity score. The red color represents a region with high antigenicity score epitope, orange indicates a region with medium antigenicity score epitope, yellow depicts region with low antigenicity score epitope and black denotes regions with no B-cell epitope. Potential B-cell epitope clusters are speculated positioned in the area with overlapping red and orange colors between two method (black arrows).

The Bepipred 2.0 algorithm predicted different epitope cluster regions from the Kolaskar-Tongaonkar method. We hypothesized that the overlapping position between two method as a potential B cell epitope clusters with maximum antigenicity score.

Within the 558 amino acid sequence designated in the heat map, the K-clustering method predicted several epitope clusters with the highest antigenicity, as shown in Table 2. One of these epitope clusters coincidentally aligned with the Y motif area of PfEMP1-DBL2β protein\(^{(19,20)}\).

**Table 2. B-cell epitope sequences and position within DBL2β-PfEMP1 protein**

<table>
<thead>
<tr>
<th>B-cell epitope Sequences</th>
<th>Amino Acid Position</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTHTLLLGEVALSA</td>
<td>77-89</td>
<td>Semi-conserved area</td>
</tr>
<tr>
<td>YQSQKYDELKKQCSQCKSK</td>
<td>236-254</td>
<td>Semi-conserved area</td>
</tr>
<tr>
<td>NTAAGYIHQELQQVGCNT</td>
<td>360-377</td>
<td>Y motif, conserved area</td>
</tr>
</tbody>
</table>
**Explanation:** B-cell epitopes prediction in overlapping area and their position within DBL2β-PfEMP1 protein. The first two epitopes located in the semi-conserved area and one aligned with the Y motif, which is a conserved area as well as a binding area with ICAM-1 receptor.

**Discussion**

The development of a malaria vaccine is still facing many obstacles. High antigenic switching rates and immune evasion ability of the parasites often cause a specific antigen-based vaccine not able to generate the expected immune response. Retrieving information about antigen immunogenicity through in vitro or in vivo experiments needs considerable time and resources, scientists call for another approach to obtain the information prior to the true experimental procedure, i.e., the bioinformatic approach, it is a powerful tool to analyze antigenic protein properties in order to design an efficient and effective vaccine\(^8\). In this study, an immunoinformatic approach towards PfEMP1-DBL2β protein from Indonesian isolate cloned previously by Sulistyaningsih\(^9\) was used to analyze the potency of the recombinant protein to bind to T cell and B cell lymphocyte.

The major histocompatibility complex (MHC) molecule is a group of receptors on the cell surface and has a major role in the immune response. Peptide sequences expressed on MHCs are called T Cell epitopes. Generally, MHC is classified into two classes; MHC I molecules with β2 microglobulin subunit, which can be recognized by CD8 co-receptors (Cytotoxic T Cell/CTL) and MHC II molecules with β1 and β2 subunit which can be recognized by CD4 co-receptors (T helper cell/Th cell).

A part of the antigenic protein bind to MHC molecules that can be recognized by lymphocyte T cell and capable of inducing an immune reaction is called immune epitopes\(^{21,22}\). Total 31 MHC I epitopes predicted in this study were subjected to population coverage analysis, showed that two conserved MHC I epitopes from PfEMP1-DBL2β Indonesian isolate protein (YIPQRLRWM and WMTEWAEMY) have almost 90% coverage rate in East Africa and West Africa. The coverage rate indicates that a vaccine design based on these presumed epitopes might be performed efficiently for most of the population in East and West Africa, where the incidence of malaria is the highest\(^{31}\).

Using different algorithm predictions from the MHC I epitopes for CTL, the analysis for Th cell epitopes mediated by MHC II molecules, showed 17 promiscuous peptides predicted to be antigenic. The potency of PfEMP1-DBL2β protein from Indonesian isolate as a T-cell epitope-based subunit vaccine was analyzed by the NN-align algorithm to identify its immune epitope. The study used three different HLA alleles commonly found in the Indonesian and African populations (HLA-DRB1*04:05, HLA-DRB1*07:01 and HLA-DRB1*11:01), there are several epitopes found with IC50 values under 50. Even though hydrophobicity values of this protein showed that it potentially fits into the active site cleft of HLA alleles, epitopes mapping depicted in Fig 2 showed that there are no overlapping epitope positions for the three alleles with IC50 values under 50. It indicated that HLA alleles polymorphic variations still pose as a factor affecting PfEMP1-DBL2β protein from Indonesian isolate affinity toward MHC Class II molecules. Additional allele variants may allow broader population coverage and can be very useful in T lymphocyte cell epitope-based vaccine development\(^{21}\).

Aside from lymphocyte T cells’ immune responsibility, lymphocyte B cells also have some essential functions in specific antibody production. Peptide regions that bind to lymphocyte B cell receptors are called B cell epitopes. The epitopes analysis on lymphocyte B cell was done by using two algorithms, i.e., Bepipred 2.0 and Kolaskar-Tangaonkar Method. Both predictions showed the antigenicity scores for every amino acid composing PfEMP1-DBL2β protein from Indonesian isolate, which was subsequently categorized based on epitopes density area in the sequences and depicted as a heat map. Fig 3 showed different epitope clusters position between two prediction method in the heat map. Several overlapping clusters were observed at the position of 77-89, 236-254 and 360-377, implicated locations of B cell epitopes with the highest antigenicity and density.

An epitope located at the position of 360-377 is coincidentally aligned with one of the few conserved areas in PfEMP1-DBL2β protein, called Y motif\(^{19}\). The Y motif is known as conserved residues that have functioned as a binding area with ICAM-1 receptor found in cerebral vasculatures. Binding between ICAM-1 and PfEMP1-DBL2β domain via Y motif is essential in the pathogenesis of cerebral malaria\(^{23,24}\). A shared conserved epitope cluster is important in malaria vaccine development because, with the high antigenic switching rate of PfEMP1, this cluster can be recognized by the
immune system and potentially able to generate a cross-reaction between parasite isolates\(^\text{25,26}\). Several studies showed that cross-reaction between PfEMP1 isolates do exist, P. falciparum infection in tourists who just come back from an endemic area have antibody with wide cross-reaction and persistent for more than 20 weeks post-infection\(^\text{27,28}\). This phenomenon, also found in placental malaria, mediated by var2CSA, showed polymorphism but wide cross-reaction toward different isolates\(^\text{29}\). The molecular base for this cross-reaction toward specific antigen has not been fully understood, but polymorphic shared epitopes between PfEMP1 isolates are expected to have a major role\(^\text{4,30}\).

**Conclusion**

The vaccine development to combat malaria as a global health problem is an important issue. In addition to advancements in technology, performing in silico study through an effective and efficient immunoinformatic approach provides ease in analysis protein immunogenicity prior to in vitro or in vivo experimental tests for vaccine development. In this current study, the immunogenicity value of PfEMP1-DBL2β protein from Indonesian isolate was conducted by Th cell and B cell epitope predictions. Homolog with DBLβPF11_0521 protein found in Tanzania children, the PfEMP1 from Indonesian isolate has B cell epitopes located in the conserved Y motif area, making it a potential subunit peptide-based malaria vaccine. A further experimental study concentrated on the delivery mechanisms and the in vitro or in vivo experimental of interaction with the immune system is needed to validate this approach as the next step in subunit peptide-based vaccine development.

**Conflict of Interest:** The authors have no conflict of interest to declare.

**Source of Funding:** This research was financially supported by the Islamic Development Bank (IsDB) through Four in One Project 2017-2019.

**Ethical Clearance:** Ethical approval with the reference number 454/H25.1.11/KE/2014 was obtained from The Ethical Committee of Faculty of Medicine, University of Jember, Indonesia.

**Consent:** The written informed consent was obtained from all the study participants. The Indonesian *Plasmodium falciparum* isolate was isolated from the blood of malaria patients. The patients were explained about the study and signed consent after a detailed explanation.

**References**

Effectiveness of Video Assisted Teaching on Testicular Self Examination

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Abstract

Testicular cancer is one of the most treatable types of cancer for around 4% of cases. More than 96% of men with early stage testicular cancer will be completely cured. Even cases of more advanced testicular cancer, where the cancer has spread outside the testicles to nearby tissue, have an 80% chance of being cured. Testicular cancer is the most common cancer in males between the ages of 15 and 35. The study topic was “Effectiveness of Video Assisted Teaching on Testicular Self Examination among young adult men in a selected college at Kanchipuram District, Tamil Nadu, India. The objective of the study were to assess the pre-test knowledge on testicular self examination among young adult men, to assess the effect of video assisted teaching on testicular self examination among young adult men, to associate between pre-test, post-test knowledge regarding testicular self examination among young adult men with selected demographic. Quasi-experimental research design was used for this study. The sample consist of 50 adult men. Self-structured questionnaire was used to assess the knowledge on testicular self examination among young adult men. The data collection period was one week. The data was collected in 50 adult men in the age group between 18 to 35 years in a selected College, Kanchipuram District, the sample was selected by purposive sampling technique. The data was analysis and tabulated. The study results shows that majority 16% having inadequate knowledge, 80% having moderate knowledge & 4% of them having adequate knowledge regarding testicular self examination after the video assisted teaching the study results shows that majority 74% having adequate knowledge, 26% having moderately adequate knowledge and none of them were having inadequate knowledge regarding testicular self examination.

Keywords: Effectiveness, Testicular Self Examination, Video Assisted Teaching, young adult, Men.

Introduction

Testicular cancer is one of the most treatable types of cancer for around 4% of cases. More than 96% of men with early stage testicular cancer will be completely cured. Even cases of more advanced testicular cancer, where the cancer has spread outside the testicles to nearby tissue, have an 80% chance of being cured. Testicular cancer is the most common cancer in males between the ages of 15 and 35.⁴

The testicles are an important part of the male reproductive system because they produce sperm and the hormone testosterone, which plays a major role in male sexual development. The different types of testicular cancer are classified by the type of cells the cancer first begins in. The most common type of testicular cancer is known as ‘germ cell testicular cancer’, which accounts for around 95% of all cases. Germ cells are a type of cell that the body uses to help create sperm.³
**Material and Method**

**Research Approach:** Descriptive Research approach

**Research Design:** Quasi experimental design

**Research Setting:** The study conducted in a selected college.

**Population:** Adult men who were in a selected college.

**Sample:** The age group between 18 to 35 years in a selected college.

**Sample Size:** \( n = \frac{[\text{DEFF} \times \text{Np}(1-p)]}{[(d^2/ Z_{1-\alpha/2}^2) \times (N-1) + p^*(1-p)]^{.50}} \) .50 samples .

**Sample Technique:** Purposive sampling technique

**Findings:**

**Section A:** Frequency and percentage distribution of demographic variables to Effectiveness of Video Assisted Teaching on Testicular self examination among young adult men in a Selected college.

**Age:** The maximum 60% of the sample belongs to the age group between 21-24 years, 40% were in the age group between 17-20 years.

**Education Status for Father:** The maximum 34% of the sample belongs to the secondary, 34% of the sample belongs to the Primary Education, 20% were in the higher education, 12% of the samples were illiterate.

**Education Status for Mother:** The maximum 40% of the sample belongs to the secondary, 28% of the sample belongs to the Primary Education, 20% were in the higher education, 12% of the samples were illiterate.

**Section B:** Distribution and percentage of pre-test knowledge on Testicular self examination.

The study results shows that majority 16% having inadequate knowledge, 80% having moderate knowledge & 4% of them having adequate knowledge regarding testicular self examination.

**Section C:** Distribution and percentage of post-test knowledge on Testicular self examination among young adult men in a Selected college.

The study results shows that majority 74% having adequate knowledge, 26% having moderately adequate knowledge and none of them were having inadequate knowledge regarding testicular self examination.

**Section D:** Comparison of Pre-test and Post-test Knowledge on testicular self examination.
It depicts that Pre-test level of knowledge regarding the Effectiveness of Video Assisted Teaching on Testicular Self Examination mean score was 4.33 and the Post-test mean score was 8.47 which projects ‘t’ value of -15.70 which was statistically significant at p <0.05 level. The ‘t’ value is greater than the table value hence the research hypothesis is accepted. The post-test knowledge score is greater than the pre-test knowledge score. There is a significant difference between pre and post test score. This indicates the Video assisted teaching on the Testicular Self Examination is effective in increasing the knowledge level among young adult men.

**Section E:** Association between post-test knowledge regarding Testicular self examination.

It reveals that there is significant association between the levels of knowledge regarding the Testicular self examination with age, educational status of mother, education status of father, occupational status of father, occupational status of mother, place of living area, family history of testicular cancer and aware of self examination p<0.05. Thus the researcher rejects the null hypothesis and accepts the research hypothesis.

**Discussion**

It deals with the discussions in accordance with the objective of the study and hypothesis. The study was conducted to assess Effectiveness of Video Assisted Teaching on Testicular Self Examination among young adult in selected college, Kanchipuram District, Tamilnadu. A total of 50 samples were selected by using purposive sampling technique; the knowledge level of samples was assessed using a self-structure questionnaire. The collected data were analyzed by using the descriptive statistic and inferential statistics. This chapter discusses the findings of the study derived.

**Summary:** This chapter deals with the analysis and interpretation of the collected data from the Effectiveness of Video Assisted Teaching on Testicular Self Examination among young adult in selected college. The data collected was tabulated and analyzed using descriptive and inferential statistics, frequency and percentage were compared to summarize the sample characteristics. Mean, mean percentage and chi square were used to compare the Effectiveness of Video Assisted Teaching on Testicular Self Examination.

**Source of Funding:** Nil

**Ethical Consideration:** Chettinad Academy of Research and Education Institution Human Ethics Committee

**Conflict of Interest:** Nil

**Reference**

Knowledge, Awareness and Attitudes About Research Ethics among Faculty and Post Graduate Students of the Medical & Dental Professionals in Professional Institutions

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Abstract

Introduction: The research ethics plays a very vital role in the collection, analysis, reporting and publication of details about research subjects, in particular active acceptance of participant’s right to privacy, confidentiality and the informed consent of the participant.

Aims: To assess the Knowledge, awareness and attitudes about research ethics among the faculty and students of medical and dental colleges and the requirement for a regular teaching about research ethics among the faculty and students of medical and dental colleges.

Materials and Method: A cross-sectional study was conducted by assessing the responses to 39 selected basic questions regarding Knowledge, awareness and attitudes about research ethics among a total of 415 faculty members and post graduate students of the medical and dental institutions in Mysore city of Karnataka state. The online questionnaire was created by using Google forms. The questionnaire was made into 5 categories. Chi-square tests was used to determine, in bivariate analyses, the association of each of the independent variables. The students t-test was done to assess the respondents scores on the 5-point Likert scale ranging from 1 to 5. The average of their scores were compared among the various variable like their specialty and academic position by using the ANOVA test.

Results: A total of 415 responses were obtained from the participants of the study. The response tabulated under various sections clearly showed deficiency in the understanding of research ethics. The P value was kept at 0.05 for this study.

Conclusion: The participants of the questionnaire survey showed that the institutional ethics committees would be very useful for promoting health research and are imperative for appraisal of the health research projects. The requirement for a regular teaching about research ethics among the faculty and students of medical and dental colleges is very important. Further study in this area is very much needed.

Keywords: Research ethics, Knowledge, Awareness and attitudes, Students, Faculty, Professional college.

Introduction

Research is defined as the systematic investigation into and study of the materials and sources in order to establish facts and reach new conclusions. It consists of three steps: to pose a question, to collect data to answer the question and to present an answer to the question.
The research ethics provides guidelines to apply moral regulations and professional codes of conduct in the various steps of research\(^2\). The research ethics provides guidelines for the responsible performance of research on human participants.

**Need for the Study:** Good knowledge about research ethics among the faculty and PG students in Health Institutions has become very important for the benefit of researcher & his team, to provide good quality of ethically made research not only for the benefit of the participants of the study, but for the whole humanity\(^5\).

**Research Question/Hypotheses:** What is the knowledge and awareness about research ethics among the among faculty and post graduate students of the medical & dental professionals in professional institutions?

How much ethics in research is being practiced among the faculty and post graduate students of the medical & dental professionals in professional institutions in their speciality?

**Materials and Method:** Out of 800 available sample size about 415 faculty members and 385 post graduate students of the medical and dental institutions in Mysore city of Karnataka state were included in the study group.

Source of Data: The faculty and post-graduate students of various dental and medical colleges in Mysore city of Karnataka state.

Inclusion Criteria: The faculty and the post graduate students of Institutions in Mysore city of Karnataka state who are interested to participate in the online questionnaire study.

Exclusion criteria: The participants who are not willing to give written the consent to answer the questions in the online questionnaire.

**Study design and settings:** The responses to 39 selected basic questions regarding Knowledge, awareness and attitudes about research ethics among a total of 415 faculty members and post graduate students of the medical and dental institutions in Mysore city of Karnataka state.

A link for answering the online questionnaire survey was sent to the Head of the Institution/Principal through an email and were requested to circulate the link for the study to all the faculty and post-graduate students of his/her dental or medical Institutions.

The participants of the online questionnaire survey were allowed at any time to withdraw from the questionnaire study before submitting their response.

To protect the confidentiality of the participant, the survey did not contain any type of information that will personally identify the participant like their email ID, name, designation or the name of their Institute.

The questionnaire was made into 5 categories. Before beginning the questionnaire, the in the first category we had set of questions to collect the demographic information of the participants like age, gender, academic position, prior participation in human research subjects, number of research projects involved in and their prior training in research ethics.

The second part of the questionnaire was used to assess the participants self-awareness towards ethical principles and functions of the ethical committees.

In the third part of the questionnaire the respondents were asked to choose their response about research ethics committee from a 5-point Likert scale ranging from 1 to 5.

In the fourth part the respondents were asked again choose from the 5-point Likert scale regarding their attitudes towards practicing of research like obtaining the informed consent from the participant, the involvement of vulnerable individuals in their study, confidentiality and conduct of research in a responsible manner.

The fifth part of questionnaire had questions regarding assessment of knowledge about research ethics with questions on case scenarios.

The data was collected and stored in a password protected electronic format.

This study was a self-funded by the Principle Investigator and the participants were not given any kind of monetary benefits for their participation.

**Timeline for the study:** The online questionnaire survey will be carried out for a period of three months from September to October 2018.

**Statistical analysis:** The Chi-square tests was used to determine, in bivariate analyses. The students t-test was done to assess the respondents scores on the 5-point
Likert scale ranging from 1 to 5. The average of their scores were compared among the various variable like their speciality and academic position by using the ANOVA test. The P value was kept at 0.05 for this study.

**Results**

A total of 415 responses were obtained from the participants of the study. Out of this we had 273 respondents as female and 142 respondents as male. Among these 225 respondents were from the medical speciality and 190 were from the dental speciality.

The results obtained are tabulated in the Graph 1 and table no 1 to 3.

**Graph No. 1: The proportion of the academic position of the respondents is representation**

**Table No. 1: The responses to details regarding involvement of the respondents in research ethics earlier**

<table>
<thead>
<tr>
<th>S No</th>
<th>Knowledge based questions</th>
<th>Response percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Absolute necessary take the informed consent from the patient before doing any research involving human subjects</td>
<td>93.6 4.3 2.1</td>
</tr>
<tr>
<td>2</td>
<td>Absolute necessary to take an informed consent/assent from the patient/guardian before doing any research involving Children</td>
<td>97.9 2.1 00</td>
</tr>
<tr>
<td>3</td>
<td>Necessary to get ethical committee approval before doing a retrospective research involving tissue samples for clinical purposes</td>
<td>85.1 4.3 10.6</td>
</tr>
<tr>
<td>4</td>
<td>Need to keep the participants details very confidential while doing a research study</td>
<td>100 00 00</td>
</tr>
<tr>
<td>5</td>
<td>Need to obtain an approval from the ethical committee before doing any type of research on human subjects</td>
<td>100 00 00</td>
</tr>
<tr>
<td>6</td>
<td>Need to obtain an approval from the ethical committee before doing any type of research involving retrospective study of patient’s data or investigation reports</td>
<td>83 4.2 12.8</td>
</tr>
</tbody>
</table>
**Table 2: The respondents to the knowledge and awareness-based questions on research ethics**

<table>
<thead>
<tr>
<th>S No</th>
<th>The details regarding involvement in prior research ethics expressed as</th>
<th>Response percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Done research involving human subjects earlier.</td>
<td>70.2 29.8 NA</td>
</tr>
<tr>
<td>2</td>
<td>Done research involving human biological samples earlier</td>
<td>55.3 44.7 NA</td>
</tr>
<tr>
<td>3</td>
<td>Had undergone any training in research ethics before</td>
<td>66 34 NA</td>
</tr>
<tr>
<td>4</td>
<td>Familiar with ethical principles in human subject research</td>
<td>76.6 4.3 19.1</td>
</tr>
<tr>
<td>5</td>
<td>Familiar with the functions of a research ethics committee in their Institutions</td>
<td>83 6.4 10.6</td>
</tr>
</tbody>
</table>

The responses to attitudes towards the research ethics committees and research ethics education. We can clearly observe here that most of the respondents suggest that the research ethics should be taught as a mandatory postgraduate module and the members of a research ethics committee should receive training in research bioethics and also all investigators should have some training in research ethics.

The participants responses to attitudes regarding practices in research ethics, was a bit surprising to know that the response to the question of getting informed consent from patients is necessary for use of their biological samples in research showed mixed response, wherein many respondents not being aware of the mandatory requirement of consent from the participants for using their biological samples for study purpose.

**Table No. 3: The responses in percentage regarding case scenarios regarding Knowledge involving various aspects of research**

<table>
<thead>
<tr>
<th>S No</th>
<th>Case scenarios regarding Knowledge involving various aspects of research</th>
<th>Correct</th>
<th>Wrong</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Case 1: Informed consent describing risks and benefits</td>
<td>332</td>
<td>83</td>
</tr>
<tr>
<td>2</td>
<td>Case 2: Research involving children</td>
<td>277</td>
<td>138</td>
</tr>
<tr>
<td>3</td>
<td>Case 3: Retrospective research on stored samples originally collected for clinical purposes</td>
<td>215</td>
<td>200</td>
</tr>
<tr>
<td>4</td>
<td>Case 4: Maintaining confidentiality in Health research</td>
<td>358</td>
<td>57</td>
</tr>
</tbody>
</table>

**Discussion**

The participants of the questionnaire survey showed a high acceptance for the requirement of research ethics committee and were had a truistic opinion that the institutional ethics committees would be very helpful and useful for promoting health research and are imperative for appraisal of the health research projects.

It was very evident from our study that most of the respondents were aware of the research ethics committee’s importance in doing health research. Majority of our respondents showed that they already had prior knowledge about research ethics and have undergone some type of training. Though about 67% of the population have shown that they had prior training in research ethics. The proportion of the respondents (34%) who have mentioned that they have not attended any type of research training, were all postgraduate students. Whereas the professors, reader/associate professors, senior lecturers have mentioned they had attended any type of research training programs earlier.

The results of our study regarding acceptance of regional ethics committee by the medical and dental speciality of various academic positions at multicentric level was found to be very complaisant with findings of the study by Hadir F. El-Dessouky et al. (2007).³

The findings of our study congruous with the study done by R. Sudhakara Reddy et al. (2018)⁴Their suggestion regarding having a teaching module in research ethics was found to be consistent with the results of our study done on both medical and dental speciality
and at multicentric study unlike the single centre study involving only the dental professionals by R Sudhakara Reddy et al.⁴

We conducted this study as there were only very few studies done earlier including all the various parameters.⁵,⁶,⁷,⁸

We had several limitations in our study. Firstly, for our study the responses from the participants were obtained through a convenience sampling. Hence, due to potential selection bias, the responses of our participants might not be representative of their respective faculties and post graduate students in each of the participating institutions.

Despite these limitations, our study provided the details about faculty and post graduate students in the medical and dental speciality the knowledge and awareness with ethical principles that steer the conduct of research and their awareness of the roles of the institutional ethics committees, the extent of their previous training in research ethics and their attitudes towards issues in research ethics and the towards institutional ethics committees.

The findings of our study highlight the need for conducting a well-structured research ethics training to faculty and post graduate students of the medical and dental speciality possibly as part of an obligatory module during their academic progress and postgraduate course.⁹,¹⁰ The participants with prior training in ethics comparatively with participants without training in research ethics were more likely to agree with several questionable practices regarding research ethics.¹¹,¹²

**Conclusion**

The results of the study also helped us to assess the requirement for a regular teaching about research ethics among the faculty and students of medical and dental colleges. We recommend that the central and local health educational bodies should implement teaching of health research teaching modules in the health education in India among all the faculties and students in health institutions.

Studies should also be done at regular intervals to assess their knowledge, awareness, attitudes and practice of research ethics before and after the taring in research ethics. The information obtained from such studies will be very useful and also guide to construct improved training programs and modules on research ethics.

**Source of Support or Funding:** Nil

**Conflict of Interest:** All authors declare that they have no conflict of interest.

**References**


Effectiveness of Healthy Emotional Expression among Girls and Boys Experiencing Anxiety and Suicide Ideation

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Abstract

As we know both genders are different and so are their needs, challenges and phases of lives. Exposure to both the gender is more or less the same these days as parents want both their kids to live a similar life. But with more freedom and liberty comes more sense of responsibility, which is missing in the current generation. They demand great deal of freedom but do not understand how to utilise it. Teenagers are very fragile and easily influenced by people around them. Harming oneself and trying to end their lives have become a status symbol for them. It was found that among 13-15 years of anxiety scores girls tends to display more anxiety and also greater improvement after the intervention. In 16-18 years of age group anxiety was found to be high among girls. Whereas the prevalence of suicide ideation was found to be more among the boys in both the age range of 13-15 years and 16-18 years than the girls.

Keywords: Anxiety, Girls, Harming oneself, Intervention and Suicide Ideation.

Introduction

WHO stated by 2020 there will be large amount of population who will die due to committing suicide and the estimation is about 1.53 million people.⁶ We live in a time where challenges are evolving in everyday basis. Things are unpredictable and so are the thought processes. According to Gross 1998,1999, Emotional expression is the verbal and non-verbal way of conveying one’s emotional experience.⁷ Whereas Elliotts & Jacob, 2013 stated that expression is a process wherein an individual express their ideas, thoughts and feelings in any format i.e speech, writing or in any other way.⁸

Anxiety: According to E. David Leonardo & Rene Hen (2008) anxiety as a state where the organism prepares himself/herself to create a response against potential threats.⁹

Browne (2018) said anxiety is a feeling of uneasiness, worry, tension about the things whose results are uncertain. There are multiple symptoms of anxiety through which one can understand that if an individual is experiencing anxiety for example, heart palpitation, restlessness, muscle tension etc.¹⁰

Symptoms of Anxiety: According to APA some common complaints shared by people who experience anxiety are difficulty in sleeping, lack of concentration, palpitations, shortness of breath etc.¹¹

Types of Anxiety Disorders: Generalised Anxiety Disorder - Individuals with GAD are always in the hunt of danger in the space and are very observant. People are unable to control their preparedness and observe even the minutest activity very carefully. Generalized anxiety disorder is “characterized by chronic excessive worry accompanied by three or more of the following symptoms: restlessness, fatigue, concentration problems, muscle tension and sleep disturbance”.¹²

Phobias: National Institute of Mental Health Worldwide stated there is about 5-12% people experience phobic disorders. Phobias are based on irrelevant belief of an individuals¹³

Types of phobias are:

• Specific Phobia
• Social Phobia
• Agoraphobia

Panic Disorder: Taylor explained Panic disorder as an abrupt surge of intense attack rising to a peak when
thoughts of particular stumble are present. Here the person experiences attack of intense terror which results in physical symptoms such as feeling uncomfortable, feels like urinating, difficulty in breathing or sweating (C Barr Taylor 2006).14

Post: Traumatic Stress Disorder -Caroline Vaile Wright, Linda L. Collinsworth, Louise F. Fitzgerald in 2009 explained that Post- Traumatic Stress Disorder is a result of distressing experiences in an individuals’ lives.15 According to DSM–V some of the common symptoms include over attentiveness, indulging in past, can’t focus on current activities, anger and depression.16

Separation Anxiety Disorder: It is mostly found among children. Usually when they stay apart from their parents Separation Anxiety Disorder is experienced (G Masi, M Mucci, S Millepiedi - CNS drugs, 2001).17 It is considered as disorder as the level of anxiety among the children is excessive and inappropriate.

Suicide: According to ED Klonsky, AM May, By Saffwe 2016, found out that one of the dominant reason for deaths are ‘Suicide’.18 It is a process of taking one’s own life and is an important reason of death worlds wide. In 2008 Matthew K. Nock, Evelyn J. Bromet, Christine B. Cha, Ronald C. Kessler, Sing Lee & Guilherme Borges understood that this low phase of life also involves a feeling of hopelessness and helplessness.19

Suicide Ideation: It was understood most of the people who displays suicidal thought do not end up indulging in the act of ending their lives. (Alexis M. May, E. David Klonsky, 2016).20 According to Nock, M. K., & Favazza, A. R. (2009) it is a deliberate effort to destroy one’s body tissues.21 Inability to deal with one’s life circumstances create a cycle of negative thoughts and the person end up ending their lives in the process. According to M. David Rudd, 1989, problem of youth suicide is a great concern.22

Healthy Emotional Expression: Facing challenges and obstacles in life journey is natural and common across all human existence but how we manage the state of mind in those dire circumstances decides the mental health of an individual. Edward J. Murray Daniel L. Segal, 1994 has stated that by practicing relaxations method like, yoga, meditation etc, last but not the least by letting those disturbing emotions go and by not pondering upon them again and again and it is recommended that one shall strive for healthy means of expressing emotions.23

In 2014, Davide Margola, Sara Molgara, Tracey A. Revenon did a research to identify which is a more effective mode of written expression. Benefit-Focused or Standard Expressive Writing on Adolescents’ Self-Concept. Two groups were made to identify the potential benefits of the two method and it was found out that in the initial 5 years more than 200 students reported in favour of Benefit Focused writing method.24

Carmen P. McLean, Anu Asnaani Brett T. Litz Stefan G. Hofmann in 2011 discovered on two parameters i:e Anxiety and Social Anxiety. These two genders of 20,013 samples size were tested for almost a year long time to come on any conclusion. It was concluded that women are more prone to report anxiety where as no gender difference were found to be effective when it comes to social anxiety.25

Caroline Smith, Heather Hancock, Jane Blake-Mortimer Kerena Eckert (2007) did random trial with yoga and relaxation to identify which method is more effective in terms of giving relief from Stress and Anxiety. This process was repeated for over 10 weeks and researchers came down to the conclusion that both method are equally effective in terms of giving relief to people with high stress and anxiety.26

Sheese, B. E., Brown, E. L., & Graziano, W. G. (2004) found the impact of expressing emotions via e-mails. 546 participants were selected for the same and were randomly categorised into long and short term traumatic writing. it entire process was repeated for 5 weeks. By the end of 5 weeks it was found out that participants reported positive physical and mental health.27

Stacey H. Kovac PhD, Lillian M. Range (2002) found the relevance of expressive writing and repeated the process of expressing emotions using pen and paper for 20 minutes for 4 days. It was found out that there was a reduction in the suicidal thoughts of people when they got the outlet of negative emotions.28

Lewnisohn, P.M., Goltib, I.H., Lewinsohn, Seeley, Allen in 1998 tried to identify the impact of gender on experiencing anxiety and it was found out that female undergo the impact of Anxiety more than men.24

Material and Method

Study population, sample size and data: The study started diagnosing 400 children with suicide
ideations and anxiety of various severity levels, part of Delhi/NCR schools, due to the exclusion criteria 340 students were dropped. The study at the end consist of 60 participants classified as Early and Late adolescents, of which 30 were females, consist of 50% of sample and remaining 30 boys were 50%.

Independent samples t-test - allows us to compare two groups of observations, all of which have come from the different group of people but possibly with a different mean for each condition. One has two experimental conditions and has used different participants in each condition. Systematic improvements in the parameters are noticed with corresponding magnitude of such effect in the population of interest. Further to support the significance of such comparisons, effect size is duly reported for every experimental phase evaluation using $r$ (Rosenthal, 1991; Rosnow & Rosenthal, 2005), Cohen’s $d$. Mean differences are evaluated using $p$-value, $t$ statistics, error bar graph, all the comparisons denoted by $p < .01/.05$ or $***$ are highly significant at both the levels of significance 1% and 5%.

**Intervention Plan:** For 3 and a ½ months students with anxiety and suicidal ideation issues were called for 1 hour for one to one interpersonal therapy sessions (30 adolescents for each group – 13-15 year and 16-18 year). The intervention focused on enhancing social support and decreasing interpersonal stress by attacking anxiety and improving interpersonal skills.

The plan is for the student to become more aware of his or her ability to deal with interpersonal problems that have kept him or her from being able to actively manage the symptoms of anxiety and suicide ideation. Three method were used to unburden the emotions, they are as follows:

a. Relaxation Therapy
b. Written Expression
c. Verbal Expression

**Tools:**
1. State – Trait Anxiety Test by Sanjay Vohra
2. Suicidal Ideation Scale by S. Sisodia & V. Bhatnagar

**Result**

![Figure 1: Depicting mean response of anxiety scores for boys and girls before and after intervention, observed in the sample of 13-15 years of school](image)

Figure 1 displays the pre and post intervention anxiety scores of boys and girls for 13-15 years of age group. Pre – intervention score for boys was 53.53 whereas the post intervention score was 41.06. For girls the pre intervention and post intervention score was 56.38 and 40.54 respectively.
Figure 2: Depicting mean response of Anxiety scores for boys and girls pre and post intervention, observed sample of 16-18 years of school students.

Figure 2 indicates Anxiety scores of boys and girls of 16-18 years age group. It was found that before intervention boys got the score of 52.62 whereas girls obtained 57.35. After intervention boys scores came out to be 42.85 and girls displayed major improvement and secures 42.82.

Figure 3: Depicting mean response of S.I scores for boys and girls before and after intervention, observed sample of 13-15 years of student.

Figure-3 displays the pre and post intervention S.I scores of boys and girls for 13-15 years of age group. Pre – intervention score for boys was 79.94 whereas the post intervention score was 60.82. For girls the pre intervention and post intervention score was 60.82 and 55.54 respectively.
Discussion and Conclusion

The aim of the current research work is to establish if three techniques i.e relaxation therapy, written expression and verbal expression are used together for the duration of 3 month would it lead to different impact on anxiety and suicide ideation scores on boys and girls in 13-15 and 16-18 years of age groups. To understand the impact of work students with Anxiety and Suicide Ideations were identified to initiate the research work. It was a great task to collect the consent of the parents to work on such a sensitive issue and also to control the withdrawal rates during the process.

Results indicates that in the age range of 13-15 years Anxiety scores for girls are found to be 56.38 (pre – intervention) and 40.54 (post – intervention) whereas boys secured the score of 53.53 (pre- intervention) and 41.06 (post- intervention). It was found girls displayed high tendency of anxiety and also a marked improvement in the state after the therapy was provided. The anxiety scores of boys and girls of 16- 18 years age group was found out to be 52.62 for boys before intervention, whereas girls obtained 57.35. After intervention boys scores came out to be 42.85 and girls displayed major improvement and secures 42.82. In 13-15 years of age group suicide ideation pre – intervention score for boys was 79.94 whereas the post intervention score was 60.82. For girls the pre intervention and post intervention score was 60.82 and 55.54 respectively. Suicide ideation scores of boys and girls of 16- 18 years was found to be 87.46 before intervention, whereas girls obtained 83.65. After intervention boys scores came out to be 72.38 and girls displayed major improvement and secures 68.29. Previous studies states the fact that during the developmental years of children conduct behavior leads to some amount of impulsivity in them.

Haravuori et al., 2017; Ranta et al., 2018 examined underpins exhibit based, organized mediations focusing on emotional wellness issue. It is perceived a developing acknowledgment of the requirement for early interventions. It can be concluded that both the gender experiences the impact of social world but they vary due to individual differences. Girls seems to be more effected with anxiety issues, on the contrary boys have reported greater tendency for suicide ideation.

Karyn E. Schweiker-Marra, William T. Marra (2010) Studies have proved the fact that pre writing the post writing of the anxiety and it has been found out that there is the marked change in writing expression.
and students reported less Anxiety issues. Stacey H. Kovac, Lillian M. Range in 2002 observed resistant in suicidal thoughts when participants jotted down the feelings.

It can clearly be concluded that the therapy is found to be effective in both the genders though the amount in which each gender experience it is different and so is the impact of the therapy.

Conflicts of Interest: Authors declares no conflict of interest

Funding: Self

Ethical Clearance: This study was entirely done for the benefit of the children. Prior consent was taken from the parents as well as from the schools to conduct the research procedure.

References
23. Kovac SH, Range LM. Does writing about suicidal thoughts and feelings reduce them?. Suicide and


Breastfeeding Benefits

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²Assistant Professor at DPSRU, Delhi

Abstract

Background: The best source of nutrition for an infant is Breastfeeding. Breastfeeding is superior for infant as comparison to the normal milk. A secretion of the mammary gland is called human milk with changing composition. Foremilk i.e. colostrum is different in nature in comparison to hindmilk i.e. mature milk. Human milk offer various benefits to both infant and mother because of its composition. This review article highlight the importance of Breastfeeding.

Objective: To study the importance of Breastfeeding.

Method: Various articles have been reviewed from Google Scholar to highlight the importance of Breastfeeding to both infant as well as mother.

Results and Conclusion: Various researches have demonstrated developmental, immunological, health and nutritional, psychological benefits of human milk in both developing as well as developed countries. Hence, breastfeeding should not be regarded as a choice but an important factor for health issue.

Keywords: Colostrum, Infant feeding, Maternal health.

Introduction

Proper magnification and development of children to their full prospective is ensured through the proper nutrition during infancy. Extensive researches have been carried out which demonstrates that breastfeeding is considered as an excellent origin of nutrition for a little one and is advantageous for both mother and young one¹.

Breast milk is extremely superior for infant feeding as compared to the normal milk. A discharge of the mammary gland is called human milk with changing composition. Foremilk i.e. colostrum is different in nature in comparison to the hind milk i.e. mature milk. Human milk contains all the nutrients needed for the child for optimal growth and development. Breast milk composed of various nutritive elements such as proteins, lipids, carbohydrates, minerals, vitamins and trace elements which are of utmost significance to attain the needs of the nutrition required by an infant. Various components which are immune-related like IgA, leukocytes, lysozyme, lactoferrin, interferon, nucleotides, cytokines and other components are also included in human milk. Various crucial fatty-acids, enzymes, hormones, factors which are growth related, polyamines and other compounds which are active biologically plays an utmost important role in the benefits related to the health associated with breastfeed. Hence, breast milk is a true functional food. It offers both small-term benefits and long-term benefits in context to health and development by not only providing nutrients but also by providing bioactive substances.²

Mothers who are full time employed mostly skip or delay expression of their milk. Major factors which leads to completely wean the children from breastfeed are return to job, insufficiency of milk supply and shortage of pumping time of milk.³

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According to American Dietetic Association, absolute breastfeeding for first 6 months of life deliver proper nourishment to the infant and combined feeding along with breastfeed till 12 months of age is considered as a perfect feeding for infants.\(^4\)

Lactation is considered good for well-being of mother also as it lessen the possibility of ovarian cancer or breast cancer, diabetes (type 2) and postpartum depression. Few researches suggest that lactation reduces the risk of premenopausal breast cancer.\(^5\)

Children who exclusively breastfeed have higher IQ rather than those who does not breastfeed because of the existence of unique fatty acids which exists in mother’s milk. Since, breastfeed is an ideal food for infant and risk factor which is modifiable, all women should be encouraged to breastfeed.\(^6\)

Benefits of Breastfeeding:

- **Prevention of Infections:** Breastfeed helps in decreasing the incidence rate and severity of broad range of infections like respiratory tract infections, otitis media, necrotizing enterocolitis, etc.

- **Protection of Immune System:** Exclusive breastfeeding lowers the incidence rate of allergies like asthma, atopic dermatitis, eczema, celiac disease, etc.

- **Diabetes, Obesity and Cardiovascular Risk:** Breastfeeding results in reduction of obesity rates to 15% to 30% in adolescence and adulthood. Breastfeeding also results in decrease in prevalence of insulin dependent (Type 1) diabetes insipidus and non- insulin dependent (Type 2) diabetes mellitus, cardiovascular diseases, etc.

- **Malignant Diseases:** Breastfeeding results in lowering the incidence of acute lymphatic leukemia, through stimulation or modulation of the immune response.

- **Neurodevelopmental Outcomes:** Breastfeeding may be associated with an advantage measured in terms of cognitive development which persists into adulthood.

- **Preterm Infants:** Breastfeeding not only decreases the rate of illness after NICU discharge but it also lowers long term failure of growth and neurodevelopmental ailments. Neurodevelopmental consequences includes finer maturation of brainstem, better outcomes on tests (cognitive and developmental tests) and better development of visual system.

**Other Health Outcomes:** It also results in decreasing the rate of unanticipated death syndrome of infant in the first year of life.

**Maternal Health Benefits:** It has numerous benefits on maternal health also like increase in concentration of oxytocin, decreasing the blood loss during menstruation, decreases chance of breast cancer and ovarian cancer, reduce possibility of postpartum depression, lactational amenorrhea, promotes bonding as well.

**Benefits for Community:** Various benefits of breastfeeding includes reduction in annual health care estimate and healthful living programs, decreases absenteeism of parental employee with association of loss of income of family, reducevigor demands for manufacture and transfer of unnatural feeding products.\(^7\)

**Discussion**

Human milk has a balance of nutrients which includes carbohydrates, cholesterol, essential fatty acids, long-chain polysaturated fatty acids, saturated fatty acids, medium chain triglycerides, low protein and sodium content as well as an ideal ratio of calcium-phosphorus that makes it easily digestible. According to WHO, the infants should be breastfed exclusively for 6 months.

The evidences report that breastfeeding is important and gold-standard for infants in terms of regulating growth and development, providing proper nutrition, developing immune response and to post-partum women as well in order to improve their health, lose weight, decrease post-partum depression and evidences of certain illnesses.

Cognitive development also has been found to be enhanced with breastfeeding due to genetic variations in metabolism of fatty acids. Studies have also suggested that DHA and AA needed for intellectual development are linked with altered gene expressions in synaptic plasticity. Thus, it can be said that human milk or breast feeding for infants is crucial for an overall development and is irreplaceable immunological source.\(^8\)

**Conclusion**

Various researches have shown that breastfeed can offer various significant benefits to infant, mother as well as community. We should support breastfeed as it is the most cost- efficient way which helps in minimizing the possibility of disorders as well as mortality. Breastfeed
should be supervised as a major public health issue. Healthcare providers play a vital role in promoting breastfeeding. Moreover, there should be proper facilities to promote the awareness and supporting the campaign of breastfeeding.

**Ethical Clearance:** Not Required

**Source of Funding:** None

**Conflict of Interest:** Nil

**References**


A Study on the Socio-demographic Profile of the Victims of Sexual Offences: A Retrospective Study

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Abstract

Background: Sexual violence against women and children has been recording an alarming rise in India. In the majority of cases, it involves younger individuals who are more vulnerable to victimization. Social and cultural factors are also considered to play a pivotal role in such offences.

Objective: This study aimed to assess the social and demographic factors of sexual offence cases brought for medical examination to identify the high-risk population.

Method: This is a retrospective study carried out in the Department of Forensic Medicine & Toxicology, JSS Medical College, Mysuru, Karnataka from January 2017 to December 2019. This study is based on the information obtained from medico-legal reports of the victim examination of alleged sexual offence cases.

Results: In the prescribed study period, 30 victims were examined. Majority of the victims belonged to the age group between 11 years to 20 years amounting to 70 % of the cases. 11 (36.6%) victims were still pursuing their secondary or higher secondary education. Unmarried victims were the maximum. In 19 (63.3%) cases, there was a consensual type of sexual activity and in most of these cases accused was a known individual.

Conclusion: The present study shows that younger age females are more vulnerable to the sexual assault especially those who belong to lower socioeconomic status and in the majority of these cases, type of sexual activity is consensual. Hence, formal education regarding legal implications associated with such sexual acts will go a long way in preventing their occurrence.

Keywords: Rape, Victim, Sexual offences, Socio-demographic profile.

Introduction

One of the verses from Manu Smriti says, Yatra Nari Astu Pujyante, Ramante Tatra Devataa – meaning “Gods reside in places where a woman is worshipped.”

In a country like India, where traditionally women are supposed to be referred to as Shakti - the ultimate power, they have now turned into inanimate objects.

Rape is among the highest forms of crime experienced by women in all sectors of society. In recent years, there has been an alarming rise in the ratio of rape in India.¹ Crime is a manifestation of myriad complex factors. The genesis of crime can be traced to the interplay of various social, economic, demographic, local and institutional factors. They together influence education, employment, parenting/family relationships,
societal cohesiveness, emotional stability, mental health, anonymity, criminal orientation, residential stability, leisure etc. which in turn influences the nature, pattern, frequency and volume of crime.\(^2\)

NCRB data in 2018 recorded 59% crime rate against women, one rape is reported every 15 minutes in India. Every fourth rape victim across the country in 2018 was a minor, while more than 50 per cent of them fell in the age category of 18 to 30 years. In 94 per cent of the cases, the offenders were known to the victims who were family members, friends, live-in partners, employers or others.\(^3\) In the present study, efforts are made to study the social and demographic factors so that we can identify the high-risk population at the earliest and stringent legislative measures can be taken to safeguard the interest of the victims and society at large.

**Materials and Method**

A three-year retrospective study was carried out in the Department of Forensic Medicine and Toxicology, JSS Medical College, JSS Academy of Higher Education and Research, Mysuru from January 2017 to December 2019. This study is based on the record of sexual assault victims who were brought for medico-legal examination in the department. The details regarding age, socio-economic status, marital status, place of incidence and relationship with the assailant were noted. The data was entered on the predesigned datasheet, tabulated and then statistically analyzed.

**Findings:** A total of 30 victims were examined in the study period. 21 victims (70%) were in the age group of 11-20 years, among them 5 each belonged to the age group of 11 to 14 Yrs and 18 to 20 Yrs respectively. 11 were in the age group of 15-17 years. In three cases the victim’s age was less than 4 years. Majority of the accused belonged to the age group of 21 -30 years (Fig 1). The age difference between the victim and the alleged accused in the majority of the cases was in the range of 0-5 years and 6 – 10 years (Table 1). In 23(76.6 %) cases, the victim belonged to the low socioeconomic status, 4 victims belonged to middle socioeconomic status and 3 came from high socioeconomic status. Table 2 depicts the educational status of the victims examined. Among 30 victims, 11 were still pursuing their education.

Unmarried victims were the maximum amounting to 22 (73.3%) cases (Table 3). In three cases the victims were 15 yrs, 16 yrs and 17 yrs respectively who were married against the provisions of law. In 10 (33.3%) cases incidence occurred in the hotel/guest house premises (Table 4).

In 93.3 % of the cases, the alleged accused was a known person (Table 5). The manner of offence in 19 (63.3 %) cases was of consensual type; among them in 11 cases (36.6 %) consent was invalid since the age of victim was less than 18 years. In 8 (26.6 %) cases there was forceful sexual act and in 3 (10 %) cases the victim denied any kind of sexual contact.
Table 1: Age gap between the victim and the alleged accused

<table>
<thead>
<tr>
<th>Age Difference between victim and accused</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5 yrs</td>
<td>11</td>
</tr>
<tr>
<td>6 to 10 yrs</td>
<td>11</td>
</tr>
<tr>
<td>11 to 15 yrs</td>
<td>02</td>
</tr>
<tr>
<td>16 to 20 yrs</td>
<td>01</td>
</tr>
<tr>
<td>More than 20 yrs</td>
<td>03</td>
</tr>
<tr>
<td>Unknown</td>
<td>02</td>
</tr>
</tbody>
</table>

Table 2: Educational status of the victims

<table>
<thead>
<tr>
<th>Level of education</th>
<th>Number of victims</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not started schooling (Age &lt; 4 years)</td>
<td>3</td>
</tr>
<tr>
<td>Post-graduation</td>
<td>1</td>
</tr>
<tr>
<td>Graduation</td>
<td>1</td>
</tr>
<tr>
<td>Class X to XII</td>
<td>10</td>
</tr>
<tr>
<td>Class VII to IX</td>
<td>10</td>
</tr>
<tr>
<td>Not attended formal schooling</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 3: Marital status of the victim/alleged accused

<table>
<thead>
<tr>
<th>Marital status</th>
<th>No of Accused</th>
<th>No of Victims</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Unmarried</td>
<td>16</td>
<td>22</td>
</tr>
<tr>
<td>Married to each other</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Unknown marital status</td>
<td>2</td>
<td>Nil</td>
</tr>
</tbody>
</table>

Table 4: Alleged place of incidence

<table>
<thead>
<tr>
<th>Place of incidence</th>
<th>Number of victims</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guest house/Hotel room</td>
<td>10</td>
</tr>
<tr>
<td>Victim’s House</td>
<td>5</td>
</tr>
<tr>
<td>Their residence</td>
<td>4</td>
</tr>
<tr>
<td>Accused’s house</td>
<td>3</td>
</tr>
<tr>
<td>Rented accommodation</td>
<td>3</td>
</tr>
<tr>
<td>Open space</td>
<td>2</td>
</tr>
<tr>
<td>Vehicle</td>
<td>1</td>
</tr>
<tr>
<td>Relatives house</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 5: Relationship with the alleged accused

<table>
<thead>
<tr>
<th>Type of relationship</th>
<th>Number of victims</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boy friend</td>
<td>15</td>
</tr>
<tr>
<td>Live – in partner</td>
<td>1</td>
</tr>
<tr>
<td>Husband (invalid marriage)</td>
<td>2</td>
</tr>
<tr>
<td>Colleague</td>
<td>1</td>
</tr>
<tr>
<td>Step father</td>
<td>1</td>
</tr>
<tr>
<td>Mother’s live- in partner</td>
<td>1</td>
</tr>
<tr>
<td>Father’s friend</td>
<td>1</td>
</tr>
<tr>
<td>Husband’s friend</td>
<td>1</td>
</tr>
<tr>
<td>Paternal uncle</td>
<td>1</td>
</tr>
<tr>
<td>Neighbour</td>
<td>2</td>
</tr>
<tr>
<td>Acquaintance</td>
<td>2</td>
</tr>
<tr>
<td>Unknown</td>
<td>2</td>
</tr>
</tbody>
</table>

Discussion

In the present study, the age of victims ranged from 3 years to 35 years. Individuals between 11-20 yrs (70%) were the most affected and among them, 80.9 % were less than 18 years of age. Hence this study suggests that teenagers are more vulnerable for such offences. Similar results were observed in various studies conducted across India on the populations of South Bangalore, Maharashtra and Assam.4-6

In our study, the majority of the victims came from the lower socio-economic background. The study conducted by Runarsdottir E et al affirms this finding, they suggested that low socioeconomic status is an indicator of social disadvantage; for females, it may independently contribute to the risk of sexual abuse.7 Similar view was expressed in a study intended to assess the magnitude and the issues related to child sexual abuse.8

In a study conducted on rape victims at Kolkata, they found that in most of the cases, the sexual assault occurred outside the house.9 Similar findings were noted in the present study in contrast to the study conducted by Haridas S et al and Gangmei Agatha et al who found that the most of these incidences occurred at accused’s house.10,11
In this study, most of the sexual assaults were committed by known individual constituting 93.3% of the cases. Similar results were found by certain other researchers.12,13

Findings of the present study reveal that manner of offence in most of the cases was the consensual type of sexual act, the majority of the victims being unmarried and still pursuing their education. A similar opinion was expressed in a study conducted in Surat, wherein the authors reported that in 83.7 per cent of the cases the sexual activity was with mutual consent.14

Our study reveals that in 36.6% of the cases although sexual act took place with mutual consent, consent of the victim was invalid as per Indian law since the age was less than 18 years. Among them, 30% of the victims were between 16 – 17 years of age.

Honourable Justice V Parthiban of the Madras High Court opined in the order concerning Criminal Appeal No. 490 of 2018 that the government should consider to redefine the word “child” to mean a person below 16 years of age instead of 18 for purposes of the Protection of Children from Sexual Offences (POCSO) Act 2012. Noting that many of the POCSO cases involved minor teenage girls in sexual relationships with teenage boys, Justice Parthiban said:

“When the girl below 18 years is involved in a relationship with the teenage boy or little over the teenage, it is always a question mark as to how such relationship could be defined, though such relationship would be the result of mutual innocence and biological attraction. Such a relationship cannot be construed as an unnatural one or alien to between relationships of opposite sexes. But in such cases where the age of the girl is below 18 years, even though she was capable of giving consent for a relationship, being mentally matured, unfortunately, the provisions of the POCSO Act get attracted if such relationship transcends beyond platonic limits, attracting strong arm of law sanctioned by the provisions of POCSO Act, catching up with the so-called offender of sexual assault, warranting severe imprisonment of 7/10 years”.

In the western world, in countries like the UK, some states of the USA and Canada the age of consent for sexual intercourse is 16 yrs. In France and Brazil, it is 15 years and 14 years respectively.16 However in India, in case a boy and girl below 18 years have sexual intercourse with mutual consent, only the boy is liable for punishment which is detrimental against the natural justice for the boy. Hence, the government has to sensitise the younger individuals about the legal provisions and its implications in such scenarios.

Education Department can take initiatives to educate the children about various provisions of Protection of Children from Sexual Offences Act 2012 since most of these cases involved minor teenage girls in consensual sexual relationships with young boys.

**Conclusion**

The present study shows that instances of a sexual offence are higher in younger age females especially among those who belong to lower socioeconomic status. In the majority of these cases, the type of sexual activity is consensual with the known person. Since most of these victims had completed or were pursuing their secondary/higher secondary education, formal education concerning legal nuances associated with such consensual sexual acts should be imparted to reduce their incidence. There is a need for further studies with a bigger sample size so that the high-risk population can be identified and educated effectively.

**Conflict of Interest:** Nil.

**Source of Funding:** This research did not receive any specific grant from funding agencies.

**Ethical Clearance:** Study was approved by the Institutional Ethics Committee.

**References**


4. Sujatha PL, Ananda K, Sane MR. Profile of victims


Mother’s Knowledge of Continuing Immunization in the Jagir Public Health Center Working Area

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Abstract

Immunization is a priority program in Indonesia that is implemented from the central government to the regions. Immunization is an effort to reduce morbidity, disability and death from diseases that can be prevented by immunization. The child’s basic needs including natural immunizations must also be fulfilled by parents. The purpose of this research is to measure mother’s knowledge of continuing immunization in the Jagir Public Health Center working area using descriptive research method. The number of samples is 200 people with random sampling technique. Data collection was carried out through interviews using questionnaires and observations. The results of the study that the majority of respondents in 3 villages working area of Jagir Public Health Center know the existence of Jagir Health Center immunization services is very good with an average percentage of 96.5%.

Keywords: Immunization children, mother’s knowledge.

Introduction

The WHO began to set the immunization program as a global effort with the Expended Program on Immunization in 1974, which was resolved by the World Health Assembly (WHA). Efforts to achieve this goal various programs based on Primary Health Care have been implemented to improve health status. Coverage of child immunizations in WHO countries still reaches 85% of babies worldwide have been immunized and there are 19.9% of infants and children have not been fully vaccinated and remain at risk of disease. Several indicators used by WHO to measure the success of these programs include infant mortality (IMR), under-five mortality rate, maternal mortality (MMR) and life expectancy. One indicator of the MDGs is to reduce child mortality by targeting to reduce the mortality rate of children under five years old (toddlers) by two-thirds in the number from 1990 to 2015 meaning that it decreased from 97 per 1000 live births to 32 per 1000 live births. Followed with health indicators in the 2015 Sustainable Development Goals (SDGs) which is the third goal, namely health insurance and health promotion for all ages.

WHO estimates that TB cases in Indonesia are the third largest in the world after China and India, assuming the prevalence of acid-fast bacillus (+) 130 per 100,000 population Since 1991, pertussis cases have emerged as frequently reported cases in Indonesia, around 40% of pertussis cases attack toddlers. the incidence of tetanus in Indonesia for urban areas is around 67 per 1000 live births, while in rural areas the figure is about 23 times higher at 1123 per 1000 live births with approximately 60,000 infant deaths each year. Furthermore, Hepatitis B is estimated to cause at least one million deaths per year. As for the case of polio, the latest data reported in total there are 295 cases of polio scattered in 10 Provinces and 22 districts/cities in Indonesia. Likewise, with the case of measles, the number of events recorded 30,000 cases reported annually. Cases of diseases that can be prevented by immunization that are of great concern lately are reported that several regions in Indonesia have been declared to have occurred in the Extraordinary Events diphtheria. The mortality rate due to diphtheria in Indonesia is around 15% and continues to increase. The results of the 2007 Indonesian Health Demographic and Survey (IDHS) showed that infant mortality in Indonesia was 34 per 1000 live births. This figure is lower than the
infant mortality rate in 2002 to 2003 which reached 35 per 1000 live births\(^{(1)}\). Thus, immunization is an effective effort to emphasize infant mortality\(^{(2)}\). The Indonesian Ministry of Health has compiled a program as an effort to suppress diseases that can be prevented by immunizing children, such as the Immunization Development Program for children since 1956. The success of infants in getting five basic types of immunization (HB0, BCG, DPT-HB, Polio and Measles) is measured through a complete basic immunization indicator. Basic Health Research Data notes, in 2007 the coverage of complete basic immunization in Indonesia averaged 41.6%. Then it increased in 2010 with an average coverage of 53.8%. In 2013 the average coverage of complete basic immunization increased again, namely 59.2%.

Immunization comes from the word “immune” which means immune or resistant. Immunization is the provision of immunity against a disease by entering something into the body so that the body is resistant to diseases that are endemic or dangerous to someone\(^{(3)}\). Immunization is an attempt to actively raise/increase a person’s immunity against a particular disease, so that if one day exposed to the disease will not be sick or only experience minor illness. Some infectious diseases that can be prevented with immunization include: tuberculosis, diphtheria, tetanus, hepatitis B, pertussis, measles, rubella, polio, inflammation of the lining of the brain and inflammation of the lungs. Children who have been immunized will be protected from various dangerous diseases, which can cause disability and death.

There are several things that affect the achievement of immunization coverage targets, including false rumors about immunization, the community believes that immunization causes children to become sick, disabled or even die, community understanding, especially parents who are still lacking about immunization and parents’ motivation to provide immunizations in children is still low. Anti-immunization Black Campaign is currently ‘intense’ in several regions in Indonesia, both through seminars and anti-immunization talkshows. Aside from general activities, they also carry out movements through social media such as Twitter, Facebook, mailing lists, or blogs. Halal-haram vaccines, conspiracies and vaccine side effects that can cause disability, autism, or even death are the main issues raised by the anti-immunization group.

The role of a mother in the immunization program is very important, so an understanding of immunization is needed. Likewise with knowledge, beliefs and health behaviors of parents. Lack of socialization from health workers causes problems in the lack of understanding, understanding and compliance of mothers in immunization programs. Based on these data it can be concluded that promotive and preventive efforts have not run optimally.

Globally, an estimated 2-3 million deaths per year have been successfully prevented due to diphtheria, measles, pertussis, polio through immunization, but there are still around 22 million babies in the world who have not received complete immunization and 9.5 million are in the South East Asian region, including Indonesia. This situation is driving global steps in raising awareness of the world community through the implementation of immunizations. Basic health research (2013) states that there was an increase in the number of complete basic immunization coverage from 2007 to 2013. In 2007 the rate of basic immunization coverage was 41.6% and in 2013 the number of complete basic immunization coverage increased to 59.2%. However, in 2013 there was an incomplete basic immunization coverage of 32.1% and 8.7% of children had never been immunized\(^{(4)}\).

Complete basic immunization coverage in Surabaya City in the last five years has always been above 85%. In 2018 complete basic immunization in the city of Surabaya was 97.77%. This figure has met the 2018 Strategic Plan target of 93.83%. Meanwhile, according to the Puskesmas, there were 56 Puskesmas (88.89%) that reached the 2018 Renstra target.

The purpose of this study was to measure the mother’s knowledge regarding continuing immunization in the Jagir Public Health Center in 2019.

**Method**

This research method uses descriptive approach. Bogdan and Tylor define as a research procedure that produces descriptive data in the form of written or oral words from the people or behavior observed \(^{(5)}\). This research was conducted on mothers who are in the working area of Jagir Public Health Center in Surabaya. The subjects in this study were mothers who had 1-2 years old babies in Jagir Urban Village, Surabaya. The subject chosen randomly aside from 3 village.
Result

The results of research on maternal knowledge of immunization are described in the following table:

**Table 1. Knowledge of Respondents Towards Immunization Services at Jagir Public Health Center in 2019**

<table>
<thead>
<tr>
<th>No</th>
<th>Village</th>
<th>Knowing the existence of immunization services at Jagir Public Health Center</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes (%)</td>
<td>No (%)</td>
</tr>
<tr>
<td>1</td>
<td>Jagir</td>
<td>65 (98,5)</td>
<td>1 (1,5)</td>
</tr>
<tr>
<td>2</td>
<td>Sawungaling</td>
<td>66 (97,1)</td>
<td>2 (2,9)</td>
</tr>
<tr>
<td>3</td>
<td>Darmo</td>
<td>63 (95,5)</td>
<td>3 (4,5)</td>
</tr>
</tbody>
</table>

The results of table 1 show that the majority of people in the work area of the Jagir Public Health Center in 2019 know about the knowledge of immunization services that is 97%.

**Table 2. Results of analysis of families with children under the age of 2019 in the Jagir Public Health Center**

<table>
<thead>
<tr>
<th>No</th>
<th>Village</th>
<th>Families with toddlers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes (%)</td>
<td>No (%)</td>
</tr>
<tr>
<td>1</td>
<td>Jagir</td>
<td>52 (78,8)</td>
<td>8 (12,2)</td>
</tr>
<tr>
<td>2</td>
<td>Sawungaling</td>
<td>47 (69,1)</td>
<td>16 (23,5)</td>
</tr>
<tr>
<td>3</td>
<td>Darmo</td>
<td>47 (71,2)</td>
<td>16 (24,2)</td>
</tr>
</tbody>
</table>

In table 2 it can be seen from the results of the above study that the majority of 3 villages in the work area of the Jagir Public Health Center in 2019 have toddlers, namely 73%.

**Table 3. Results of the analysis of respondents who knew about Continuing immunization services at Jagir Public Health Center in 2019**

<table>
<thead>
<tr>
<th>No</th>
<th>Village</th>
<th>Who knows about continuing immunization services at Jagir Public Health Center</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes (%)</td>
<td>No (%)</td>
</tr>
<tr>
<td>1</td>
<td>Jagir</td>
<td>56 (84,9)</td>
<td>1 (1,5)</td>
</tr>
<tr>
<td>2</td>
<td>Sawungaling</td>
<td>53 (78,0)</td>
<td>0 (0,0)</td>
</tr>
<tr>
<td>3</td>
<td>Darmo</td>
<td>46 (69,7)</td>
<td>2 (3,0)</td>
</tr>
</tbody>
</table>

In table 3 it can be seen from the results of the study of the majority of respondents or more than half the number of respondents know that the existence of continuing immunization services at Jagir Public Health Center in 2019 is 77%.

**Table 4. Results of analysis of the benefits of continuing immunization according to respondents in the work area of the Jagir Public Health Center in 2019**

<table>
<thead>
<tr>
<th>No</th>
<th>Village</th>
<th>Benefits of Continuing Immunization according to respondents</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Increasing the body’s defense and protection against infections and various serious diseases (%)</td>
<td>Make the body strong (%)</td>
</tr>
<tr>
<td>1</td>
<td>Jagir</td>
<td>52 (78,8)</td>
<td>3 (4,6)</td>
</tr>
<tr>
<td>2</td>
<td>Sawungaling</td>
<td>49 (72,0)</td>
<td>0 (0,0)</td>
</tr>
<tr>
<td>3</td>
<td>Darmo</td>
<td>49 (74,0)</td>
<td>0 (0,0)</td>
</tr>
</tbody>
</table>

In table 4 it can be seen that respondents in the work area of the Jagir Public Health Center in 2019 The majority answered A, namely increasing the body’s defense and protection against infections and various serious diseases that is 75%.
Table 5. Analysis of toddlers who have received further immunizations in the region Jagir Public Health Center work in 2019

<table>
<thead>
<tr>
<th>No</th>
<th>Village</th>
<th>Toddlers who have received further immunization</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes (%)</td>
<td>No (%)</td>
</tr>
<tr>
<td>1</td>
<td>Jagir</td>
<td>50 (75.8)</td>
<td>7 (10.6)</td>
</tr>
<tr>
<td>2</td>
<td>Sawungaling</td>
<td>43 (63.2)</td>
<td>8 (11.8)</td>
</tr>
<tr>
<td>3</td>
<td>Darmo</td>
<td>46 (69.7)</td>
<td>4 (6.1)</td>
</tr>
</tbody>
</table>

In table 5, it can be seen from the results of the respondents above the majority or more than half of the community respondents in the work area of the Jagir Public Health Center in 2019 who have toddlers who have received further immunization at 70%.

**Discussion**

According to the Health Act No. 36 of 2009, immunization is an effort to prevent infectious diseases, especially to reduce child mortality. An understanding of immunization is needed by parents as a basis for meeting children’s health needs. Provision of basic immunization in children must be based on the existence of a good understanding from parents about immunization as an effort to maintain children’s health through disease prevention efforts. So parents are expected to be aware of and have a positive understanding of immunization. The results showed that the majority of respondents in 3 villages in the work area of Jagir Public Health Center knew that there was an immunization service at Jagir Public Health Center namely, Jagir village 98.5%, Sawunggaling village 97.1% and Darmo village 95.5% in this result indicated the respondent’s knowledge coverage is good enough.

The quality of immunization services that are less than optimal will certainly waste resources that have been spent such as operational costs, vaccines, immunization logistics, manpower and time. Even what is most concerning for all of us is the failure of immunization will threaten the occurrence of illness, disability or death in children. Basic immunization is very important given to infants aged 0-11 months, in the early days of a baby’s life, babies are very susceptible to the disease and if the baby is exposed to the disease it will cause physical, mental, disability and cause death. Immunization is done so that the baby can continue to grow and develop optimally in a healthy state. In order to be achieved, immunization coverage must be maintained high and carried out evenly.

Furthermore, the results of the study showed that of the 3 urban villages, Darmo Urban Village at least indicated that this village needed more attention or the Public Health Center could be more active in informing that there was an immunization service at Jagir Public Health Center, while the majority in the Jagir Public Health Center work area from 3 villages show that the majority of respondents have toddlers and the percentage of respondents who have toddlers in Darmo is 71.2%.

Immunization is a way to actively raise/increase a person’s immunity to a disease, so that if one day he is exposed to the disease it will not be sick or mild illness. Infectious disease is the biggest cause of mortality and morbidity in children, so it is very important to do preventive measures through basic immunization. Children have the right to protection from infectious diseases. Children should not receive incomplete immunizations without consideration of consequences for both the child and the community.

According to the Indonesian Ministry of Health (2001), the purpose of immunization is to prevent illness and death of infants and children caused by frequent outbreaks. The Indonesian government strongly encourages the implementation of the immunization program as a way to reduce morbidity, mortality in infants, toddlers/pre-school children.

The results of this study also showed that respondents who knew of continuing immunization services at Jagir Public Health Center in Darmo Village were 69.7%. Regarding the benefits of immunization, the majority of respondents in Darmo Village answered that the benefits of continued immunization are to increase the body’s defense and protection against infections and various serious diseases, which is 74%. And from the results of the study above shows that toddlers in Darmo Village who have received further immunization at 69.7%.
Conclusion

Immunization is a way to actively raise/increase a person’s immunity to a disease, so that if one day he is exposed to the disease, he will not get sick or mild illness. From the results of the above research it can be said that the majority of respondents in the 3 urban areas of the Jagir Public Health Centre work area know that the Jagir Public Health Center immunization service is very good with an average percentage approaching perfect that is 97%.

Based on the above research results it can be concluded that knowledge for basic immunization for infants is very necessary because after all complete basic immunization is very important for toddlers and not only that here also the relationship between the role of parents is needed, especially the mother is very important in providing basic immunization with status baby immunization. Because after all, if minimal parental knowledge of complete basic immunization will affect the health of the toddler.

Conflict of Interest: The authors have no conflict of interest with the material presented in this paper

Sources of Funding: None

Ethical Clearance: None

References

Performance and Perception of First MBBS Students Towards Simultaneous One Sitting Web Based Assessment for Introductory Topics in Anatomy, Physiology and Biochemistry

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Abstract

Web-based formative assessment tools have become widely recognized education as valuable resources for self-directed learning. Introducing Google forms for simultaneous assessment of first year subjects in MBBS students is a time saving acceptable approach.

Objectives: To introduce a simultaneous online web based assessment tool (Google forms) for first year MBBS students.

To evaluate the perception and attitude of the first MBBS students towards the assessment tool (Google forms).

Method: 122 first year medical students were informed about an simultaneous one sitting test 4 days prior for the introductory topics in Anatomy, Physiology and Biochemistry. A web page link was shared with the students in their google account and student were asked to reply to the 45 questions asked in the google form. The performance of the students were analyzed in the spread sheet. After completion of the test student were asked to fill 20 questions feedback form each questions were based on Likert scale to evaluate their attitude and perception towards the online assessment of Anatomy, Physiology and biochemistry at a single sitting. The feedback questionnaire was analyzed.

Results: On analyzing the feedback questionnaire it was shown 75 % of students felt answering in google forms are fairer and 65% felt its better than pen and paper assessment. 79% of the students had trust in google forms as they felt cheating cannot be easily done in this tool. 68% of the students felt marking is more accurate in this tool. On analyzing the performance of the students it is seen, 61.4 % of the students were above 50% of the total score out of which 27.04% of the students scored more than 75% . Only 16% of the students were below the 25% of total score.

This study thus showed, students were interested in using the new tool in assessing their knowledge and they too wanted to use the link for revising their subject in future..

Keywords: Formative assessment, integrated assessment, Feedback questionnaire, Google form.

Introduction

Modern era students are familiar with the emerging technologies and its uses. These technologies can be utilized as learning resources, can be well accepted among students as it is beneficial and popular among them. Self assessment helps the students to identify the weak areas and thereby they can focus on it. An ideal assessment method should be reliable, valid, cost effective, feasible and acceptable to students and teachers and should be easy to use and unbiased. No single method of assessment can meet all these

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requirements. Each and every method of assessment has some strengths and weaknesses which should be critically analyzed and combination of few method can be used.\textsuperscript{2,3} Multiple studies showed beneficial impact of formative assessments on overall performance of the students by increasing students active participation, preventing procrastination and providing immediate feedback on their performance. Online administration of formative assessments has great advantages, including easy accessibility and availability, interactive features, immediate and individualized feedback and automated scoring which can positively motivate the students to practice and take up these tests.\textsuperscript{4,5,6,7}

Google Forms is a component of Google Docs, which is a free, web-based tool for managing various kinds of files including text documents, spreadsheets and presentations. With Google Forms, a teacher can create a set of questions and invite students to respond to those questions, either through e-mail or on a web page. Google Forms can be used in any course as long as the students have access to computers and internet.\textsuperscript{8,14} Medical council of India’s new policies are recommending integrated teaching of basic science subjects with clinical aspects and system wise approach. As we are integrating the subjects teaching through horizontal and vertical approach the assessment too needs to be simultaneous and integrated to get a positive impact.\textsuperscript{9} Thus the attempt to integrate the medical subjects should not stop with the teaching alone it should be extended over to the assessment of the subjects learnt in the form of common assessment of the coordinated subjects taught during a particular year in medical curriculum. This study attempts to evaluate the performance and perception of students in using google forms for assessment of their knowledge acquired through a MCQ test for integrated assessment of introductory topics taught in Anatomy, Physiology and Biochemistry in a single sitting.

**Method**

Institutional ethical clearance was received prior to the study. Consent was taken from the First MBBS students of 2019-20 batch for the study. The introductory topics in Anatomy Physiology and Biochemistry was taught which included General Anatomy and general embryology, General Physiology, nerve and muscle physiology and in Biochemistry it was Eukaryotic cell its organelle and cell cycle. 45 Multiple choice questions were framed in google forms 15 questions for each subjects. Each MCQ item contained a stem and four options. Correct option if chosen was awarded 1 mark. Incorrect option is given 0. Students were informed about simultaneous test 4 days prior. 122 medical students present on the Day of the test and they tookup the simultaneous test of all three subjects in Google form. Students were asked to log into their google accounts using the internet service provided by institution in their smart phones or Apple I pads. The web page containing the 45 questions were given to them and they were asked to open and answer the questions. Technical help was provided if some failed to access. After completion of the test students were given a questionnaire for feedback to evaluate their attitude and perception towards web based simultaneous assessment of Anatomy, Physiology and Biochemistry at a single sitting. The performance of the students was analyzed in spread sheets and recorded. The feedback questionnaire consisted of both 20 structured open and close ended questions framed after literature review appropriately validated and each question rated on a five point Likert scale. Data was analyzed by SPSS software and descriptive statistics was used. The feedback questionnaire had four main components i.e. 1. Perception and attitude of the students towards using google forms for MCQ test 3. Reliability of the questions and appropriateness using the tool 4 Practicality of using an integrated assessment and user friendliness. (Table 1,2,3,4).

**Results**

122 first year medical students took up the survey with the feedback questionnaire on simultaneous assessment by Multiple Choice question in google form answered online. In the questions determining the attitude of students towards the new online tool 55% of the students felt live answering to the questions in google forms was not stressful and 70% of student felt the tool was interesting and enjoyable. About 47% of students wanted to recommend the tool to their peers and solve questions in this format. (table-1)

75 % of students felt answering in google forms are fairer and 65% felt its better than pen and paper assessment. 79% of the students had trust in google forms as they felt cheating cannot be easily done in this tool. 68% of the students felt marking is more accurate in this tool. (table- 2).

Majority of the students felt the MCQ questions were appropriate and was not too difficult and was relevant to the topics taught. 55% of the students felt its
easy to score marks in MCQs in google form. 76% of students felt they can use the MCQs in google form in revising their lessons in future and its good for recalling. 77% of student felt the MCQ questions had improved their knowledge and critical thinking. (table 3).

In the next observation the practicality of simultaneous assessment of questions from all the subjects of first year in a single testing format was assessed. 66% of students preferred simultaneous assessment as it was less stressful and easy and 78% of students felt it is less time consuming. 67% of the students felt simultaneous assessment should be included partly in university examination. About 29% of students felt preparing for simultaneous one sitting assessment is tedious and confusing as they have to read all the three subjects for preparing. (table 4).

Table 5 (Analyses the performance of the students in MCQ test) shows the total number of responses and percentage of correct responses to the MCQs in google form. About 72.96% of total responses were correct. Table 6 shows the performance of the students in the integrated test. 61.4% of the students were above 50% of the total score out of which 27.04% of the students scored more than 75%. Only 16% of the students were below the 25% of total score.

This study not only shows that students were interested and accepted using google forms as assessment tool it also shows students performed quite well in simultaneous assessment of all three first year subject in a single test setting. The future prospect of this study is reflected in their eagerness in using the tool for other topics in an integrated way and their desire to include simultaneous online assessment in university exams.

The NYC School of Medicine Online Self Assessment Tool (SOMOSAT) an online self assessment tool consisting of >450 MCQs covering multiple specialities in medicine was administered to the second year medical students accurately predicted student performance on future exams. Students also performed better in future exams and it was helpful in filling knowledge gaps. Similarly in this present student felt integrated self assessment in google forms were regarded by 77% of students to improve their knowledge and critical thinking. Online simultaneous formative assessment promotes self directed learning and also time saving especially in medical curriculum. The study conducted by Kavitha et.al in OBG department did not show a significant difference in performance of the students in summative exams who had participated in prior online formative assessment test to those student who had not attended. 11

In a study conducted by Bijoy et.al. on web based formative assessment tool for renal pathology unrestricted and optional access was given to quizzes for medical students and performance of quizzed and nonquizzed students were observed and it showed the quizzers performed statistically better than nonquizzers in their exams. 89% of students felt the quizzes improved their knowledge. In the present study too majority of students wanted self assessment formative MCQ test in future to fill their knowledge gaps, revising their subjects and wanted to recommend to their peers. 12

This study not only aimed at teaching general Anatomy, general Physiology and cell biology in Biochemistry in an integrated manner but also the assessment was conducted as a single test from all the three specialities. This integrated simultaneous approach which is new of its kind has provided a bird’s eye view of the topics taught in three different subjects well integrated and timed not only during teaching but also while assessing the knowledge of the students.

Currently Medical Council of India has revised teaching and learning in undergraduate medical course to competency based medical education with early clinical exposure and horizontal and vertical integrated teaching learning approach. Implementation of simultaneous one sitting assessment the curriculum too needs to be integrated thoroughly. Assessing how students use basic science concepts in clinical reasoning which is vertical integration should go hand in hand with understanding and relating within the particular year too through horizontal integration. Simultaneous one test approach for multiple specialities taught in the same academic year at a single sitting is not only time saving but also prepares the medical graduates to prepare for PG entrance and international competitive exams in future. 13
Table 1: Perception and attitude of students towards the integrated MCQ test

<table>
<thead>
<tr>
<th>SI No</th>
<th>Questions</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The questions were time consuming</td>
<td>35%</td>
<td>20%</td>
<td>45%</td>
</tr>
<tr>
<td>2</td>
<td>The questions were relevant well framed</td>
<td>76%</td>
<td>20%</td>
<td>4%</td>
</tr>
<tr>
<td>3</td>
<td>Using the internet and live answering to the questions were stressful</td>
<td>33%</td>
<td>19%</td>
<td>55%</td>
</tr>
<tr>
<td>4</td>
<td>Answering to the question in google forms was interesting</td>
<td>70%</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>5</td>
<td>I will recommend this tool to peers and would like to solve in future</td>
<td>47%</td>
<td>27%</td>
<td>26%</td>
</tr>
</tbody>
</table>

Table 2: Reliability and security of the MCQ test in google forms.

<table>
<thead>
<tr>
<th>SI No</th>
<th>Questions</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Answering questions on google forms are fairer</td>
<td>78%</td>
<td>12%</td>
<td>10%</td>
</tr>
<tr>
<td>2</td>
<td>Online exam using google forms are better than pen and paper based assessment</td>
<td>65%</td>
<td>13%</td>
<td>22%</td>
</tr>
<tr>
<td>3</td>
<td>It easy to cheat in google form based MCQ test than in paper exams</td>
<td>11%</td>
<td>10%</td>
<td>79%</td>
</tr>
<tr>
<td>4</td>
<td>Marking is more accurate in google forms than in manual correction and evaluation</td>
<td>68%</td>
<td>7%</td>
<td>25%</td>
</tr>
</tbody>
</table>

Table 3: Validity of the MCQ test by Google forms

<table>
<thead>
<tr>
<th>SI No</th>
<th>Questions</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MCQ question in google form is easy to score marks</td>
<td>55%</td>
<td>12%</td>
<td>33%</td>
</tr>
<tr>
<td>2</td>
<td>The chapters taught in my subjects are too tough compared to the MCQ test in google form</td>
<td>25%</td>
<td>7%</td>
<td>63%</td>
</tr>
<tr>
<td>3</td>
<td>The MCQ test questions in google form are complex and difficult</td>
<td>34%</td>
<td>11%</td>
<td>55%</td>
</tr>
<tr>
<td>4</td>
<td>The MCQ questions in the google can be used for revising my subject in future</td>
<td>76%</td>
<td>11%</td>
<td>13%</td>
</tr>
<tr>
<td>5</td>
<td>The questing in this tool was relevant to the topics taught</td>
<td>87%</td>
<td>6%</td>
<td>7%</td>
</tr>
<tr>
<td>6</td>
<td>The questions in this tool has improved my knowledge and allow for critical thinking</td>
<td>77%</td>
<td>14%</td>
<td>9%</td>
</tr>
</tbody>
</table>

Table 4: Practicality of Integrated assessment using MCQs in Google forms

<table>
<thead>
<tr>
<th>SI No</th>
<th>Questions</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Integrated combined assessment of Anatomy, Physiology and Biochemistry through MCQs by using Google forms is easy and less stressful</td>
<td>66%</td>
<td>15%</td>
<td>18%</td>
</tr>
<tr>
<td>2</td>
<td>Integrated assessment using the Google forms are less time consuming</td>
<td>78%</td>
<td>4%</td>
<td>18%</td>
</tr>
<tr>
<td>3</td>
<td>Good IT skills will help me to solve questions faster in Google forms</td>
<td>40%</td>
<td>20%</td>
<td>40%</td>
</tr>
<tr>
<td>4</td>
<td>Preparation for integrated assessment is difficult and confusing</td>
<td>29%</td>
<td>15%</td>
<td>56%</td>
</tr>
<tr>
<td>5</td>
<td>Integrated assessment through MCQs in Google forms are preferred and should also be a part of University exams</td>
<td>67%</td>
<td>10%</td>
<td>23%</td>
</tr>
</tbody>
</table>
Table 5: Shows the total responses and percentage of correct response

<table>
<thead>
<tr>
<th>Number of participants</th>
<th>Number of questions</th>
<th>Number of responses</th>
<th>Number correct responses</th>
<th>Number of incorrect responses</th>
<th>% of correct response</th>
</tr>
</thead>
<tbody>
<tr>
<td>122</td>
<td>45</td>
<td>5490</td>
<td>3962</td>
<td>1528</td>
<td>72.96</td>
</tr>
</tbody>
</table>

Table 6: Performance of number of students according to scores

<table>
<thead>
<tr>
<th>SI No</th>
<th>Below 25 % of total score &lt; 11.25 score</th>
<th>25%-49% of total score (11.25 – 22)</th>
<th>Above or equal to 50% of total score (22.5)</th>
<th>51 – 74% of total score</th>
<th>Equal to 75% or above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students</td>
<td>20</td>
<td>27</td>
<td>75</td>
<td>42</td>
<td>33</td>
</tr>
<tr>
<td>Percentage of students in each category</td>
<td>16.39%</td>
<td>22.13%</td>
<td>61.4%</td>
<td>34.42%</td>
<td>27.04%</td>
</tr>
</tbody>
</table>

Figure 1
Conclusion

Assessment has always formed an integral and important part of teaching and learning process, especially in formal medical education. Online web based assessment offers a range of benefits in improving the process of learning and on the other hand reduces the workload for teachers and administrators. This study introduces usage of Google forms in assessment of knowledge of introductory topics in basic science subject in a simultaneous single sitting formative exam pattern. The main benefits in this type of assessment process include the elimination of time and space restrictions existing in the case of paper or face-to face exams. At the same time, as google forms are self assessment tools the student is able to gauge their performance too thus this immediate feedback allows for a genuine formative evaluation. In this study first year medical students were exposed to Google forms and E assessment that too in an integrated simultaneous common questionnaire for all three subjects of first year and its intended that this process of assessment will be recommended to university curriculum committee to introduce online google form based formative assessments in a formal way as an assessment tool in future.

Institutional ethical clearance was taken prior conducting the above study

Source of Funding: Self

Conflict of Interest: None

References


Changing Trends in Teaching Method for Medical Students-Prosection Versus Dissection of Cadavers

Sudakshina Chakrabarti
Assoc Prof of Anatomy, Saveetha Medical College & Hospital Chennai

Abstract

Background: Cadaveric dissection is considered a tool for studying structural details of the human body. Prosection is demonstrating anatomy of wet specimens preserved and already dissected by experts. In prosection students get to see multiple wet specimens, museum specimens already dissected by experts and learn by observing the structures.

Methodology: Study is conducted on 30, 1st year MBBS students divided randomly into 2 groups each having 15 students-- Group A and Group B. Informed consent is taken from all the participants prior to the study. The second part of study conducted on final year MBBS students on their view on cadaveric dissection.

The anatomy of the neck region which extends over 8 hours of dissection classes are taught to the group A by traditional dissection demonstration method. The same is taught to Group B by prosection technique. The following day the performance of the students are assessed by a spot identification test consisting of 15 questions each of 2 marks pertaining to the specimens as a practical test. In the second part of the study feedback is taken in form of a validated questionnaire from final year MBBS students about their view on cadaveric dissection.

Results: The performance of the spot identification test conducted on the students was analysed uniformly and corrected by 2 experts. The results shows the performance of group B (Prosection group) was significantly better than group A (p value 0.034 at 95% CI). On analysing the feedback majority of final year students liked dissection on cadavers and they felt it promoted group learning and future knowledge on surgical instruments and skills.

Conclusion: This study suggest that utilizing prosections of the neck region specimens seem to be advantageous pedagogical approach for teaching Gross Anatomy. Based on the views on cadaveric dissection of final year students it is better to adopt combined approach and expose students to both techniques dissection and prosection.

Keywords:- Prosection, Dissection, demonstration, specimens questionnaire.

Introduction

A good knowledge of clinical Anatomy is fundamental and indispensable to efficient and safe clinical practice and for the understanding of other subject disciplines such as physiology, pathology and surgery for a medical students.

Cadaveric dissection is considered a tool for studying structural details of the human body. Major part of practical working in gross anatomy consists of cadaver dissection by students. This method of learning human gross anatomy is time-honoured and highly effective recent years. Time and again the relevance and value of dissection as a tool for teaching anatomy to medical students have been under discussion at different
Due to cultural practices which makes availability of cadavers difficult and also increase in number of students in medical course there is a rapid decline in student cadaver ratio. The high costs, time intensity, the requirement for highly skilled teachers and the emotionally challenging nature of cadaveric dissection as well as being a cause of significant psychological distress among medical students have been cited as its potential disadvantages of cadaveric dissection. This has ultimately resulted in using newer techniques to teach Gross Anatomy. Not only the student cadaver ratio is unfavourable there is also a need of completing the syllabus of gross Anatomy in a limited time frame available for first year MBBS. With reduction in contact hours less emphasis being given to the basic science courses in the pre-clinical years of medical education and with the need for integration has resulted in the need for educators in the anatomical sciences to develop new pedagogical approaches which are more time efficient at the same time do not compromise students learning experiences.

Prosection is demonstrating anatomy of wet specimens preserved and already dissected by experts which is being considered as an effective teaching tool in Anatomy for undergraduate medical students. Thus in prosection students get to interact with multiple wet specimens, already dissected by experts and learn by observing the structures. Students working together to learn from prosected materials may spend more time focused on the learning objectives than students dissecting in a team where most of them are just passive observers. Students working with multiple prosected specimens have the opportunity to view several variations, rather than the single variation which may or may not be present in their dissection cadaver. With the present integrated medical curriculum and less time allotted for basic science subjects there is a need to judiciously manage the time available. Complete dissection of cadaver by first year medical students is time consuming and there no concrete evidence as whether it is required or not for a medical graduate. Dissection skill is not a required competency for undergraduate medical student as per medical council of India curricular regulation. Not only prosected specimens an increasing number of computer assisted learning tools (CAL) have been introduced to fill in the practical aspects of teaching human anatomy especially for cross sectional anatomy. Newer techniques like plastinated specimens are also being used and used increasingly. This study is an attempt to introduce prosection as a regular tool in teaching Anatomy to first year MBBS students as an alternative to cadaveric dissection. This study also assesses the perception of final year medical students on the importance of dissection in learning gross anatomy as a feedback using a validated questionnaire and whether they would prefer dissection.

**Objectives:**

- To compare the performance of the students who are taught Gross Anatomy of neck region by dissection versus students taught by prosection method.
- To assess the perception of students towards including prosection in regular teaching method in Gross Anatomy.

**Material and Method**

Project proposal approval was obtained from Institutional ethical committee in Saveetha Medical College & Hospital. Study was conducted in two parts.

- 30 randomly selected 1st year MBBS students were divided randomly into 2 groups each group of 15 students.
- Group A and Group B. Informed consent is taken from them after explaining the study.
- Permission to conduct the study was taken from the HOD of Anatomy department and permission of taking help from other teaching staffs was obtained from the head of department.

The anatomy of the neck region which extends over 8 hours of dissection classes was identified which includes a. Midline structures of neck, b. anterior triangle and c. posterior triangle dissection and demonstration. The above regions are taught to the group A by traditional dissection demonstration method. The same regions are taught to Group B through interactions by experts on already dissected preserved wet specimens and museum specimens by prosection technique.

Group B classes are taken in the museum and they were not allowed to dissect for the study period. Classes being taken in respective groups simultaneously is being shown in Fig 4.

Both groups were given an extra of 2 hours for revision of the specimens and at the end of 10 hours of Dissection classes the following day the performance of the students are assessed by a spot identification test consisting of 15 questions each 2 marks pertaining to the
specimens as a practical test conducted at the end of the session.

Once the study period was over the Group B students were allowed to dissect the neck.

In the second part of the study informed consent was taken from 150 final year medical students of the same college. A validated self framed questionnaire in Likert scale of 10 questions was used to assess the perception of final year MBBS students about cadaveric dissection. Internal validity of the questionnaire was tested using Cronbach’s alpha. The total questionnaire Cronbach’s alpha value was calculated as 0.613 which is acceptable. Each participant was given 10 minutes to fill the form which was collected back for analysis. The questionnaire is shown in table 3

Performance of the 30 first year MBBS students of Group A and Group B was statistically analysed. The questionnaire collected from the final year students were analysed SPSS version 21 was used to analyze the data.

**Results**

The performance of the spot identification test conducted on the first MBBS students Grp A and Grp B was analysed uniformly and corrected by 2 experts. The results are shown in Figure 1.

The Mean score, Median and standard deviation was calculated and plotted in table 1

Difference of mean value between two groups ia 3.00, standard error is 1.348. Applying paired t test it was seen at 95 % confidence interval the P value obtained is <0.05 . table 2 and Fig 2 So the difference in the performance of the two groups is significantly better in Group B students taught by prosection technique than group A students taught by cadaveric dissection and demonstration.

The responses of the questionnaire was analysed by percentage and frequency. On analysis of the questionnaire filled by final year MBBS students it was seen they preferred cadaveric dissection. 71% of students agreed that orientation and consistency of gross structures are better observed in cadaveric dissection. 87% students felt visual memory of the structures were better after dissection. 77% of students strongly agreed that dissection helped them to learn how to use basic surgical instruments in future years. 81% of the students felt dissection promoted group learning and discussion. 90% of the final year students felt they learnt to respect the dead in dissection hall. Thus cadaveric dissection is favored strongly among final year students. Table 3 & Fig 3.

**Table 1: Marks obtained by Group A and group B--analysis.**

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>18.26</td>
<td>21.26</td>
</tr>
<tr>
<td>Median</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>Mode</td>
<td>18</td>
<td>24</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>4.25</td>
<td>3.03</td>
</tr>
</tbody>
</table>

**Table 2: Statistical analysis of the test score of both groups**

<table>
<thead>
<tr>
<th>Difference in mean</th>
<th>3.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard error</td>
<td>1.348</td>
</tr>
<tr>
<td>95% confidence interval</td>
<td>0.2378 to 5.7622</td>
</tr>
<tr>
<td>t- statistics</td>
<td>2.225</td>
</tr>
<tr>
<td>DF</td>
<td>28</td>
</tr>
<tr>
<td>Significance level</td>
<td>P= 0.034</td>
</tr>
</tbody>
</table>

At 95 % confidence interval P value <0.05 is considered significant

**Table 3: Questionnaire and responses**

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orientation of structures is better learnt while dissecting</td>
<td>59 (39%)</td>
<td>54 (36%)</td>
<td>31 (20%)</td>
<td>6 (4%)</td>
</tr>
<tr>
<td>2</td>
<td>Consistency of Structures are appreciated better in dissection.</td>
<td>60 (39.5%)</td>
<td>58 (38.6%)</td>
<td>22 (14%)</td>
<td>10 (6%)</td>
</tr>
<tr>
<td>3</td>
<td>Dissection helps students to learn to respect the dead.</td>
<td>82 (54%)</td>
<td>58 (38.6%)</td>
<td>8 (5%)</td>
<td>2 (1%)</td>
</tr>
<tr>
<td>No.</td>
<td>Question</td>
<td>Strongly agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly disagree</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------------------------------------------</td>
<td>----------------</td>
<td>-------</td>
<td>----------</td>
<td>-------------------</td>
</tr>
<tr>
<td>4</td>
<td>Everyone is able to participate during dissection.</td>
<td>58 38.6%</td>
<td>66</td>
<td>19</td>
<td>7 4.5%</td>
</tr>
<tr>
<td>5</td>
<td>Visual memory following a dissection is better than demonstration.</td>
<td>71 47%</td>
<td>60</td>
<td>14</td>
<td>5 3.6%</td>
</tr>
<tr>
<td>6</td>
<td>Chances of altering the normal anatomy and damage to structures and thus enable to identify important structures - happens in dissection.</td>
<td>29 19.3%</td>
<td>38</td>
<td>49</td>
<td>34 22.6%</td>
</tr>
<tr>
<td>7</td>
<td>Active participation is more in dissection, students work as a team</td>
<td>41 27%</td>
<td>83</td>
<td>21</td>
<td>5 3.6%</td>
</tr>
<tr>
<td>8</td>
<td>Health hazards and injury risks to medical students are more with dissection.</td>
<td>33 22%</td>
<td>23</td>
<td>47</td>
<td>47 31.3%</td>
</tr>
<tr>
<td>9</td>
<td>Dissection helps the student to learn how to use basic surgical instruments.</td>
<td>56 37.3%</td>
<td>58</td>
<td>23</td>
<td>13 8.6%</td>
</tr>
<tr>
<td>10</td>
<td>Dissecting is an useful tool for learning Anatomy</td>
<td>59 49%</td>
<td>49</td>
<td>34</td>
<td>8</td>
</tr>
</tbody>
</table>

**Fig 1: Marks obtained by group A and group B students in spot identification test.**

Blue – Group A, Red – Group B
Fig. 2: Shows the percentage analysis of each response for each question

Fig. 3: Responses of the questionnaire is plotted
Discussion

This cross sectional study conducted in two parts first part was to analyze the performance of first year MBBS students to two different pedagogical approach of teaching and learning gross Anatomy which clearly showed a significantly better performance of student taught by prosection technique and the second part of the study which was a survey conducted on final year students with a questionnaire which clearly showed final year students preferred dissection. In 2004 a study was conducted to consider the arguments related on use of cadavers for teaching Anatomy and to put forward the rationale in removing cadaveric dissection from a new medical school. They developed a curriculum design, assessment and evaluation process based on imaging, clinical skills and living anatomy for teaching Anatomy to first year students.15

In another review paper it is seen that Africa and USA are the leading areas where medical schools are offering cadaveric dissection. In Canada several medical schools have retained compulsory cadaveric dissection in their undergraduate program. In Asia data suggest India has continued teaching anatomy with cadaveric dissection. In European countries and Australia cadaveric dissection is not rampantly used. Many medical schools in UK and Australia are offering optional cadaveric dissection for undergraduate students.10,11,12.

In a another similar study conducted by Nnodim J O et al on two matched group of preclinical students the students belonging to the group taught by experimental prosection technique performed better in the practical exam and multiple choice question test and difference was statistically significant.2 Present study too has a very similar result and difference in performance of the two groups is statistically significant p value 0.034.

A questionnaire study conducted on first year medical students on their views on cadaveric dissection showed 76% of students are excited and most of them did not have fear of dead 65%. 85% felt cadaveric dissection gives better result than only demonstration on prospected specimens and 70% wanted dissection to be continued in Anatomy.13 These findings are very similar to our present study where final year students preferred cadaveric dissection in Anatomy and most of them liked dissection classes during their first year. Table 3 & Fig 3

Journal of Anatomical Record invited faculty of four prestigious medical schools of US to represent the changing views of cadaver teaching in Anatomy and usage of technology to replace cadaveric teaching. In that discussion Kimberly S Topp from University of California brought out the concept of pre dissected specimens and bodies for teaching Anatomy in alternative to cadaveric dissection by students. Though diagrams, animations, digital simulations do provide idea about the anatomical structures they are oversimplified. Ruff an author from John Hopkins has the view that there is definitely a sense of curiosity and satisfaction in hands on dissection especially appreciating the variations and organs in each cadaver. The texture of the structures, variations, reality of the specimens can be well appreciated in prospected specimens too.14

Though students complained of horrifying thoughts, anorexia, nausea, loss of appetite, fainting attacks, eye irritation etc on exposure to cadavers and dissection in first few days of their exposure to cadaveric dissection still dissection and prosection are learning tools in Anatomy which cannot be substituted by other method.16

Conclusion

This study suggest that utilizing prospected specimens for pedagogical teaching of the gross anatomy of neck region seem to be advantageous for students in identifying structures in the practical spotter examination and score higher marks. The performance of the first year students was statistically better for group B students taught by the above method. On analysing the view point of final year students on cadaveric dissection using questions based on Likert scale it showed students preferred dissection during their first year while learning Anatomy. Thus keeping in mind the final year medical students view point and better performance of first year students taught by pedagogical approach using prospected specimens it is concluded that both traditional teaching using cadaveric dissection and teaching with prosectedspecimens should be done hand in hand. This study findings show that complete removal of cadaveric dissection from MBBS curriculum would not be welcomed by medical students and there is a need of cadaveric dissection according to the survey. Thus it is recommended that cadavers can be judiciously used for teaching specific regions of gross Anatomy and students should be encouraged to participate in dissection. Prosection should also be included as a pedagogical approach in teaching gross Anatomy for improving the performance of the students in examinations.
Ethical clearance obtained from institutional ethical committee prior to the study.

**Conflict of Interest:** None

**Funding:** Minimal self.

**References**


Comparison of Quadriceps Muscle Girth Using Ultrasound Imaging In Supervised vs Unsupervised Post Operative ACL Reconstruction

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Abstract

Injury to the anterior cruciate ligament (ACL) is one of the most common knee ligament injuries. The ACL injury is a sprain or tear of the anterior ligament (ACL). Effective exercises will reduce the risk of ACL injury. An ACL injury in athletes is a higher incidence than other general public, such as soccer, basketball, hockey, etc. The aim of this study was to compare the effectiveness, recovery rate and variance in both knee-affected and non-affected muscle girth readings in supervised v/s unsupervised patient groups after the patient underwent ACL reconstruction surgery. The participants were divided into two groups (A-Supervised and B-Unsupervised) through a random sampling. The supervised exercise in group A performed according to the WILK protocol at RML hospital and un-supervised group B performed the same WILK protocol at home. The ultrasound scans were performed after 2-4 weeks and 12-14 weeks post operation to measure the muscle girth in both the groups. The study findings indicated the significant difference in recovery rate as well as the difference in between supervised v/s unsupervised groups i.e. the difference of affected and unaffected knees based on ultrasound imaging was higher in un-supervised group compared to supervised group (a difference of 2.3 mm in post-operation muscle girth after 12-14 weeks). The ultrasound reading of the muscle girth after 2-4 weeks post-operation showed a decline in the recovery of the muscle girth in both the groups (9% and 8% for supervised and un-supervised groups respectively). This reduction in the muscle girth value as compared to the pre-operative values was due to arthroscopic effect, which showed there was a transient deactivation of the muscle take place due to surgery. The ultrasound reading of the muscle girth after 12-14 weeks post-operation showed a different progressive recovery of the muscle girth in both the groups as 31% and 10% for supervised and un-supervised groups respectively. We concluded that supervised exercises was better than unsupervised exercises for the early recovery after ACL recontraction.

Keywords: Quadriceps; Muscle girth; ACL; Ultrasound; Recovery.

Introduction

The knee is a weight-bearing joint which operates as a fulcrum between tibia and femur. ACL is present in the knee and the bone structure of the knee joint is made up of the tibia, femur and patella¹². The knee is basically a pivoted joint that is held together by the Posterior Cruciate (PCL) ligaments, Medial Collateral (MCL), Anterior Cruciate (ACL) and Lateral Collateral (LCL)³⁴. The ACL is located diagonally in the knee as is shown in the below figure, keeping the tibia from sliding out before the femur and also giving rotational steadiness to the knee. The ACL is one of the four primary ligaments inside the knee that associate the femur to the tibia⁵⁻⁷. ACL tends to be at risk as it prevents posterior displacement of the distal femur on the tibia. ACL can tear due to twisting type of force acted at the joint in such
ACL reconstruction may be defined as the functional restoration of the ACL to its native dimensions, collagen orientation and insertion sites. ACL Reconstruction is the technique in which the tunnels are placed in the centre of the native femoral and tibial insertion sites. It can be done either through a single bundle or double bundle. Anatomic ACL reconstruction can be used in both single and double-bundle reconstructions and also to Augmentation surgery. Complete restoration of the native ACL may not be possible, because of the complex nature of the ligament. However, the surgeons always attempt towards close proximity.

ACL injuries received the greater attention of orthopaedic surgeons and due to their deep analysis of the subject, it became possible to treat such injury. Previously, the cases of ACL were not reported so frequently in India as in the current scenario due to the absence of sufficient analytical skills & required tools. But now the incidences of ACL has increased and after an ample amount of research in this field, the surgeons are able to perform ACL Reconstruction successfully. There is as low as 2.5% chance of recurrent instability due to rupture of the reconstructed ligament or maybe poor surgical technique. The post-operative examination was carried out by a non-operative observer. On the first postoperative day, digital anteroposterior and lateral knee radiographs were completed without a strap. For the direction and inclination of the tunnel on the frontal and sagittal planes, the femoral tunnel was evaluated in radiographs. The follow-up was done weekly, then at 2-3 weeks, three months and one year. During 1-year follow-up, a practical performance review was conducted with the Lysholm knee scoring system. A rolimeter (Rolimeter TM for measuring anterior/posterior knee joint laxity by aircraft) was used to assess previous tibial translation quantitatively. Pivot shift testing was performed. The main objective of the study was to compare and to find out the relative progression of muscle girth readings in supervised v/s unsupervised ACL reconstruction patient.

**Material and Method**

Eighty-two subjects (73 male 9 female) at the age group of 18-40 yrs were enrolled for this study between November 2016 to December 2018. All the participants had undergone ACL reconstruction surgery at RML hospital Delhi. The selection of participants was volunteered and their consent for performing Ultrasound imaging was provided formally. The participants were divided into two groups as Group A: Supervised and Group B: Unsupervised. The average age of participants in supervised and unsupervised groups were 27.5 and 28.5 years respectively. The inclusion criteria were Post-operative anatomic ACL reconstruction. The exclusion criteria were any degenerative changes, bone infections, any previous injury in lower limb other than an ACL injury, any metabolic disorders like diabetes, obesity.
and hypertension, any meniscal or PCL injury and Pre-operative MRI Scan confirming ACL tear only no associated injury to menisci or other ligaments.

**Assessment:** Detail assessment was performed according to the assessment performa measuring the mid thigh circumference and special tests and strength of the muscle. WILK protocol was adopted for the strengthening exercise for both the groups for a duration of 3 months post operative.

**Measurement of quadriceps muscle girth:** Ultrasound is most commonly used in the assessment of soft tissue disease or fluid collection detection and may also be used to visualize other structures, such as cartilage and bone surfaces. All measurements in patients were performed three times: measurements were performed on the Kranzbüchler ultrasound machine, Medizinische Systeme GMBH, Germany, using a 7.5 MHz linear probe (Medizinische). During the measurements, the subjects lay on their backs with stretched/extended legs, their muscles relaxed and their feet in a neutral position. Both legs were examined for both the groups and muscular girth was measured by horizontal and vertical scanning of the upper leg, in the centre of the upper leg and 5 cm proximal and distal from the centre. In their central segments, m. vastus intermedius and m. rectus femoris have square shapes. The reproducibility of the ultrasound procedure was calculated by several measurements of 10 healthy volunteers over one day, as a change in muscle volume can not be predicted in such a short period of time. The error of this process was calculated on the basis of the variations and the uncertainty coefficients of these measurements.

**Statistical tests:** The SPSS 24 (Statistics System for Social Science) was used for statistical analysis. The paired t-test and was performed, which was having a significance p-value (less than 0.05). The findings of the one pair sample statistics for supervised group is having a mean value for study group is 14.3 mm, for normal/un-effected limb is 15.2 mm. Whereas the standard mean difference of 0.9 mm for three month post operative to normal. Furthermore the standard error value of 0.24 and 0.36 for three month post operative and normal respectively. On the other hand the values for supervised group is having a mean value for study group is 12 mm, for normal/un-effected limb is 15 mm. Whereas the standard mean difference of 03 mm for three month post operative to normal and furthermore the standard error value of 0.29 and 0.38 for three month post operative and normal respectively.

Muscle dimensions were measured on off-line scans using Image J software (available http://rsb.info.nih.gov/ij/docs/index.html). Muscle thickness was measured as the greatest vertical distance between the anterior and posterior borders of RF from their inside edges. Measurement of quadriceps muscle girth:

**Results**

The figure 2 showed the data for supervised and un-supervised groups. The following information was tabulated in the Excel spreadsheets: sex, age, ms mid quad for normal, ms mid quad in pre-operation, ms mid quad in 8 weeks of operation and ms mid quad in 12-14 weeks of operation for both supervised and unsupervised groups. A total of 164 participants were divided into two groups, i.e. 82 in each group. The pre-operative values of muscle girth for supervised was 10.83 mm and for unsupervised was 10.93 mm. The ultrasound reading after 2-4 weeks post operation for supervised group was 9.83 mm and for un-supervised was 10.11 mm respectively. Both the readings of post operative 2-4 weeks, was having a downwards recovery of the muscle girth. The findings of the one pair sample statistics for supervised group is having a mean value for study group is 14.3 mm, for normal/un-effected limb is 15.2 mm. Whereas the standard mean difference of 0.9 mm for three month post operative to normal. Furthermore the standard error value of 0.24 and 0.36 for three month post operative and normal respectively. On the other hand the values for supervised group is having a mean value for study group is 12 mm, for normal/un-effected limb is 15 mm. Whereas the standard mean difference of 03 mm for three month post operative to normal and furthermore the standard error value of 0.29 and 0.38 for three month post operative and normal respectively.
Discussion

The ultrasound reading of the muscle girth after 2-4 weeks of post-operation showed a decline in the recovery of the muscle girth in both the groups (-9% and -8% for supervised and un-supervised groups). This reduction in the muscle girth value as compared to the pre-operative values was due to arthroscopic effect, which showed there was a transient deactivation of the muscle which took place due to surgery. The ultrasound reading of the muscle girth after 12-14 weeks post-operation showed a significant progressive recovery of the muscle girth in both the groups (31% and 10% for supervised and un-supervised groups respectively). This progression in the muscle girth value as compared to the pre-operative values (the difference between the progression in the two group) is significant (21%), is due to the approach in supervised exercise vs un-supervised exercise, where the focus is for isolated muscle activation of the knee. The statistical data analysis provided a comprehensive understanding of the gain in the muscle girth and the data would be inferred that the recovery rate in supervised group is relatively approaching towards the normalcy, whereas in the un-supervised group the difference in the affected and normal is relatively higher i.e. it is deficient of recovery of muscle strength post operatively. It was also observed that in the un-supervised group, the muscle atrophy was very significantly visible in comparison with the supervised group. Furthermore it was also observed that the functional strength required post operatively for the knee was lacking in the un-supervised group. This study also reflected the importance and the significance of the exercise done under supervision where the physiotherapist and the patient could adopt focused approach to develop the required muscle strength and substitution of the other muscle groups could be avoided, which was lacking in the unsupervised group, where patients are complying with the exercise protocol but unable to discriminate the muscle group to be strengthened and using the gross muscles for the thigh leading to the imbalance of the muscle strength between the agonist and the antagonist group i.e. knee extensors and knee flexures muscles.

Conclusion

With the above study the authors concluded that supervised exercises in post operative ACL reconstruction plays a very significant role for the recovery and also reduces the chances of post operative complications remarkably.
**Ethical Clearance:** Taken from the ethical committee of post graduate institute of medical education & research, Dr. Ram Monohar Lohia Hospital, New Delhi approved the study.

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**Conflict of Interest:** Nil.

**References**


Exclusive Breastfeeding, Blood Volume and BleedingDuration on Postpartum Period at Kassi-Kassi Primary Health Centre (PHC), Makassar, Indonesia

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Abstract

**Introduction:** Breastfeeding has been widely recognised as benefiting for infants and mothers. It could avoid haemorrhage after giving birth (postpartum). The study aimed to observe the association between exclusive breastfeeding, blood volume and blood duration in a postpartum period.

**Method:** This was an analytic study with a cross-sectional design. The number of samples was 56 postpartum women who were chosen by purposive sampling method. A questionnaire was used in collecting data by interviewing the respondents. Data was analysed using descriptive statistic and chi-square test.

**Result:** There were 78.57% respondents breastfed exclusively and 21.43% did not breastfeed exclusively. In this study, exclusive breastfeeding related to bleeding duration \((p=0.00)\), while blood volume was not associated with exclusive breastfeeding \((p=0.06)\).

**Conclusion:** There was a relationship between exclusive breastfeeding and blood duration. Meanwhile, exclusive breastfeeding was not associated with blood volume.

**Keywords:** Exclusive Breastfeeding, Blood Volume and Bleeding Duration.

Introduction

Providing exclusive breastfeeding is an important intervention to reduce neonatal, infant or child morbidity and mortality. It is a good strategy as well for child survival. Breast milk is a very good intake in the first thousand days of birth because it provides complete nutrition for baby and it is ideal for the few first months as it is nurture provided by the nature\textsuperscript{1}. Breastfeeding infants is the best way to improve nutrition and the quality of human resources.

Breastfeeding optimizes the development of nerves and the brain, provides immune substances against disease and builds the emotional bond between mother and baby\textsuperscript{2}. Breastfeeding not only give benefits for baby but also for mother. Early initiation of breastfeeding could reduce the risk of postpartum haemorrhage\textsuperscript{3}.

Postpartum Haemorrhage (PPH) is a major determinant in maternal morbidity and mortality\textsuperscript{4,5}. The consequence of excessive blood loss during childbirth is a significant problem. According to World Health Organization (WHO) in\textsuperscript{3}, it is estimated that around...
800 women die every day because of preventable disease during pregnancy and postpartum, in which 99% of the death are in developing countries. Among ASEAN countries, Indonesia is on the fifth in terms of maternal death. The main cause of the deaths is complications during pregnancy and mostly occur during the postpartum period which was mainly caused by haemorrhage. WHO defines PPH as a blood loss of 500 ml or more, while severe PPH is defined as vaginal bleeding more than 1000 ml within 24 hours after birth. By this definition, around 14 million cases of postpartum haemorrhage (PPH) occur each year, affecting about 6% of all women giving birth around the world. There was some research about PPH in Indonesia have been carried out. However, this study focused on exclusive breastfeeding, related to blood volume and duration of bleeding after birth.

**Method**

This study is an observational study with cross-sectional design which was conducted in Kassi-Kassi Primary Health Centre (PHC) area, Makassar, Indonesia. This study focused on exclusive breastfeeding at one month of postpartum period. Sampling method used was purposive and the number of samples was 56. The criteria of sample:

Inclusive criteria: women who have a baby aged 1 month and live in Kassi-Kassi PHC area, the women breastfed exclusively (breast milk only) and did not have health problems related to their labour.

Exclusive criteria: women did not breastfeed exclusively and have health problems during the postpartum period.

For data collection, a questionnaire was used as a research instrument. The questionnaire was consisted of some questions such as characteristic of respondents, parity, type of labour, sanitary pad change and duration of bleeding. Respondents were interviewed directly when visiting PHC for their baby’s immunization. Data were analysed by using SPSS program and the result was showed in frequency and cross-tabulation table. Chi-square test was applied to observe the association between exclusive breastfeeding, blood volume and duration of vaginal bleeding.

**Findings:** The number of samples which was analysed in this research is 56. Table 1 shows that of 56 respondents, most of them aged 20-35 years (89.29%) and only 3.57% aged under 20 years. The highest education level is university, 53.57% respondents who graduated from university and 7.14% was junior high school. In this study, most of the women were housewife (60.71%) and a civil servant (7.14%).

The percentage of respondents who are parity 1 and 2 is 57.14% and 42.86 respectively. For the delivery process, the vast majority of respondents gave birth through vaginal birth (96.43%) and caesarean only 3.57%.

In terms of breastfeeding, 78.57% breastfed exclusively and 21.43% non-exclusive. Most of the women (96.43%) have blood volume loss <500ml and only 3.57% more than 500ml. For the duration of vaginal bleeding, less than 14 days (78.57%) and 21.43% more than 14 days.

Table 2 and 3 show the association between exclusive breastfeeding, blood volume and duration of vaginal bleeding. All respondents (100%) who breastfed exclusively have blood volume < 500ml (table 2). However, the percentage of women who did not breastfeed exclusively and had blood volume < 500ml was high as well (83.3%). Respondents who did not breastfeed exclusively and had blood volume >500ml was 16.7%. Chi-square test revealed that there was no association between exclusive breastfeeding and blood volume (p=0.06).

Table 3 shows that 97.7% of respondents who breastfed exclusively and the duration of vaginal bleeding was under 14 days. Meanwhile, respondents who did not breastfeed exclusively and had bleeding duration > 14 days were 91.7%. The percentage of women who did not breastfeed exclusively and had bleeding duration < 14 days was 8.3% and mother who breastfed exclusively but had bleeding duration > 14 days was 2.3%. Chi-square test show that exclusive breastfeeding related to the duration of vaginal bleeding (p=0.00). These results can be observed in the following tables (Frequency table and cross tabulation table).
### Table 1. Characteristics of Respondents

<table>
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<tr>
<th>Characteristic</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
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<td></td>
</tr>
<tr>
<td>&lt; 20</td>
<td>2</td>
<td>3.57</td>
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<tr>
<td>20 – 35</td>
<td>50</td>
<td>89.29</td>
</tr>
<tr>
<td>&gt;35</td>
<td>4</td>
<td>7.14</td>
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<tr>
<td><strong>Education</strong></td>
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<td>7.14</td>
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<tr>
<td>Secondary High School</td>
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<td>39.29</td>
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<td>University</td>
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<td>53.57</td>
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<tr>
<td><strong>Occupation</strong></td>
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<tr>
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<tr>
<td>Entrepreneur</td>
<td>18</td>
<td>32.14</td>
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<tr>
<td>Civil Servant</td>
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<td>7.14</td>
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<tr>
<td><strong>Parity</strong></td>
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</tr>
<tr>
<td>1</td>
<td>32</td>
<td>57.14</td>
</tr>
<tr>
<td>2</td>
<td>24</td>
<td>42.86</td>
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<tr>
<td><strong>Type of Birth</strong></td>
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<tr>
<td>Normal (vaginal birth)</td>
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<td>96.43</td>
</tr>
<tr>
<td>Caesarean</td>
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<td>3.57</td>
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<tr>
<td>Non-Exclusive</td>
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<td>21.43</td>
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<tr>
<td><strong>Blood Volume</strong></td>
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<tr>
<td>&lt;500</td>
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<td>96.43</td>
</tr>
<tr>
<td>&gt;500</td>
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<td>3.57</td>
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<tr>
<td><strong>Duration of vaginal bleeding</strong></td>
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<td>78.57</td>
</tr>
<tr>
<td>&gt;14 days</td>
<td>12</td>
<td>21.43</td>
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### Table 2. Exclusive Breastfeeding and Blood Volume

<table>
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<th>Blood Volume(ml)</th>
<th>Total</th>
<th>P-Value</th>
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<tr>
<td></td>
<td>&lt;500</td>
<td>&gt;500</td>
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</tr>
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<tr>
<td></td>
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<td>10</td>
<td>16.7</td>
<td>12</td>
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### Table 3. Exclusive Breastfeeding and Blood Duration

<table>
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<th>Total</th>
<th>P-Value</th>
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<tbody>
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<td>&gt;14</td>
<td>n</td>
</tr>
<tr>
<td>Yes</td>
<td>43</td>
<td>1</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>97.7</td>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>8.3</td>
<td>91.7</td>
<td></td>
</tr>
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</table>
Discussion

Exclusive Breastfeeding and Blood Volume:
Breastfeeding is the most effective way to ensure the health and survival of both infants and mother. WHO recommended providing exclusive breastfeeding (6 months) for a child without giving any formula milk and any food. In this research, exclusive breastfeeding was defined as an activity breastfeeding of respondents who gave breast milk only to their baby at least for 1 month. The result of this study revealed that all the respondents who breastfed exclusively had blood volume < 500ml. However, the data showed that the percentage of the mother who did not provide exclusive breastfeeding and had blood volume < 500ml is high as well. The result of this study suggested that there was no association between exclusive breastfeeding and blood volume.

World Health Organization (WHO) and The United Nation Children’s Fund (UNICEF) recommends early initiation of breastfeeding within one hour of birth to stimulate breast milk production. It also stimulates uterine activity which can reduce the risk of heavy bleeding and infection. Maternal death in the postpartum period can be caused by the amount of blood (volume) that comes out after delivery. The simple and easy strategy to reduce the Maternal Mortality Rate (MMR) and Infant Mortality rate (IMR) is breastfeeding directly (early initiation) and breastfeed exclusively to baby because breast milk contains Immunoglobulin which can prevent infection and diarrhoea.

Nipple stimulation, either manually using a breast pump or by encouraging the baby to suckle is a method to reduce bleeding after birth. It can be used immediately after childbirth to increase the secretion of the hormone called “oxytocin”. Thereby, if the mother breastfeeds the baby immediately after giving birth, postpartum bleeding can be prevented or blood volume will be lower. When oxytocin is released or the level increase, it causes uterus contraction and helps the uterus back to the normal size which can lead to the reduction of postpartum bleeding. Early initiation and the breastfeeding frequency immediately after birth will reduce the amount of vaginal blood loss and improve uterine involution. Some studies found that breastfeeding related to postpartum haemorrhage. A retrospective cohort study which analysed birth cohort (n=3671) and conducted in New South Wales (NSW) Australia (2015) showed that breastfeeding and skin-to-skin contact immediately after giving birth may be effective in reducing PPH for women at any level of risk of PPH. A quasi-experimental study (n=50) conducted in Alexandria, Egypt (2004) revealed that early breastfeeding had a statistically significant effect (p=0.001) on post-birth blood loss. The early breastfeeding group of women lost less than 150 ml of blood; the later breastfeeding group lost 300 ml or more. A study which was carried out in Tegal regency, Indonesia (2015) showed that there was a relationship between early breastfeeding and postpartum haemorrhage.

However, this study, conducted in Kassi-Kassi PHC, Makassar city of Indonesia, showed a different result with the previous studies that stated breastfeeding influences vaginal bleeding after birth. This study suggested that exclusive breastfeeding was not related to blood volume after birth. The results showed that although all women who breastfed exclusively had blood volume < 500ml, the percentage of women who did not breastfeed exclusively and had blood volume < 500ml is high as well (83.3%). This result could be explained that exclusive breastfeeding is not the only one strategy to prevent blood volume loss > 500ml or postpartum haemorrhage, but at least breastfeeding and skin to skin contact immediately after childbirth should be encouraged to stimulate and release oxytocin hormone that helps to reduce vaginal bleeding. The result of this study is similar to systematic review found that there is not a significant difference between nipple stimulation (breastfeeding) versus no treatment concerning the incidence of PPH (>500ml) and blood loss in the third stage of labour.

Although this study revealed that there was no association between exclusive breastfeeding and blood volume, exclusive breastfeeding has many benefits both infant and mother. It is not only can prevent haemorrhage but also prevent complication in a postpartum period. Thereby, it could reduce maternal morbidity and mortality after birth.

Exclusive Breastfeeding and Duration of Vaginal Bleeding: Duration of vaginal bleeding in this study is how long the bleeding occurs in a postpartum period, whether less than 14 days or more than 14 days. The result showed that the percentage of women who breastfeed exclusively and had bleeding duration < 14 days is very high and proportion of mother who did not provide exclusive breastfeeding and had bleeding duration > 14 days is very high as well. The results of
this study revealed that exclusive breastfeeding is related to the duration of vaginal bleeding.

In the process of lochia discharge, there are stages which require certain period of time. The time needed to release lochia depends on the smoothness of the discharge, if the lochia discharge smoothly, the time required will be faster, that is ≤ 14 days and conversely, if the lochia is not smooth, the time required will also be longer that is > 14 days. This study is supported by research which stated that mothers who experience stress during pregnancy and childbirth can cause breastfeeding problems whether breastmilk release or not. The hormones responsible for the lactation process are prolactin and oxytocin. Women who are being stress will affect the release of the hormone from neurohypophysis that leads to a blocking of the let-down reflex when the baby is being breastfed. These hormones have a role in stimulating the process of uterine contractions that influence lochia discharge.

A study in Indonesia shows, of the 30 respondents who breastfeed their baby (early initiation), there were 25 respondents (83.3%) who had high normal uterine fundus. A decrease in the normal uterine fundus occurs because blood (lochia) which release after birth lasting <14 days. Conceptually the dominant factor influencing the return of menstruation or bleeding after childbirth is a hormonal regulation factor. The hormone that has an important role in bleeding begins with the release of the prolactin. This hormone is secreted by the anterior pituitary gland due to the stimulation of baby suction when suckling in the mammary areola area. Suction stimulation will be continued to the spinal cord through sensory nerve impulses and passed on to the brain, namely to the hypothalamus. In the next process, the hypothalamus will give a command to the posterior and anterior pituitary glands. The posterior pituitary gland secretes the hormone oxytocin which is useful for smoothing out breast milk. If the production of the hormone prolactin and the hormone oxytocin continues smoothly, it affects the uterus and ovaries. This effect is related to the smoothness of breast milk discharge needed by the baby at any time. Continuous suction in the mammary areola area gives a positive effect of myoepithelial cell contractions so that breast milk is quickly excreted. It will also have an impact on the uterus so that no bleeding and duration of bleeding will be shorter.

The let-down reflex coincides with the production of prolactin by the anterior pituitary, stimulation originating from the baby’s sucking is continued to the posterior pituitary (neurohypophysis) which is then excreted oxytocin. Through the bloodstream, this hormone goes to the uterus, causing contractions. The contraction of the squeezing milk breast that has been made, out of the alveoli and into the duct system and then flows through the ductus lactiferous into the baby’s mouth.

Neurohypophysis periodically secretes oxytocin (pulsatile). This process stimulates milk secretion from breastfeeding by causing contraction of myoepithelial cells in the alveoli and small milk ducts. Ejection or breast milk discharge is a reflex that is initiated by the suction of the nipple which stimulates neurohypophysis to release oxytocin. Breastfeeding also speeds up uterine involution because repeated stimulation of the nipple will release oxytocin which causes contraction of the uterine muscle.

WHO recommends providing exclusive breastfeeding for babies until 6 months. Providing exclusive breastfeeding to infants will increase uterine involution thereby reducing postpartum complications. Breastfeeding also has a positive impact on the mother because the baby’s sucking will cause uterine contractions that prevent post-partum bleeding. During breastfeeding, oxytocin releases after childbirth also reduce uterine bleeding and prevent about one-fifth of neonatal deaths. Therefore, a health provider should provide nutrition and lactation counselling for women during pregnancy and after childbirth.

Conclusion

This study found out that all of the women who breastfed exclusively had blood volume loss <500ml, but the percentage women who did not breastfeed exclusively and had blood volume loss <500ml is high as well. Thereby, this study suggested that there was no association between exclusive breastfeeding and blood volume loss. Meanwhile, exclusive breastfeeding related to the duration of vaginal bleeding after birth.

Conflict of Interest: No conflict interest regarding this study

Source of Funding: Muslim University of Indonesia

Ethical Clearance: Muslim University of Indonesia
References


Analysis of Community Empowerment in the Implementation of Healthy Living Movement Programs (GERMAS) in the Regional Post-Disaster Palu City

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Abstract

Community empowerment is one of the global strategies for health promotion so that community empowerment is very important to do so that the community as the primary target has the will and ability to maintain and improve health. The Healthy Living Community Movement Program (GERMAS) is basically a public health effort through community empowerment. This study aims to analyze the process of community empowerment in the implementation of the Healthy Living Community Movement Program (GERMAS) in post-disaster areas. This type of research is qualitative using a phenomenological study approach. Data collection is done by in-depth interviews, document review, FGD (Focus Group Discussion), and documentation. The results showed that the implementation of community empowerment in the Healthy Living Community Movement Program (GERMAS) by conducting integrated collaboration with related sectors such as Empowerment of Family Welfare (PKK), National Narcotics Agency (BNN), Ministry of Religion, Office of Women’s Empowerment and Child Protection and banking. Incentives for health cadres are budgeted by the Health Office of the City of Palu in the amount of Rp. 150,000 (one hundred and fifty thousand Rupiah) per quarter.

It was concluded that community empowerment in the implementation of GERMAS in the post-disaster area of Balaroa Village was in the aspect of partnerships in the form of cooperation with various cross-sectors in that program, integration of GERMAS with other priority programs such as GALI GASA, coordination with all stakeholders by involving community leaders, youth leaders, and the K5 task force. From the aspect of the budget in the form of budget allocation in every financing activities of the program and providing incentives for cadres. From the aspect of evaluating activities in the form of a final report on activities, the residents have cultivated vegetables and other plants in their own yards.

Keywords: Community Empowerment, Germas, post-disaster.

Introduction

The condition of public health in Indonesia is currently experiencing major challenges namely the three burden of disease (triple burden) because there are still infectious diseases, increasing non-communicable diseases (PTM) and diseases that should have disappeared again. The country of Indonesia faces changes in disease patterns or what is often called the epidemiological transition in the last 30 years. The biggest causes of death and illness in the 1990s were infectious diseases such as upper respiratory infections (ARI), TB, diarrhea, etc.¹

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There are many health problems in general that occur in Indonesia, especially in the city of Palu, which has experienced natural disasters due to the earthquake, tsunami, and liquefaction on 28 September 2018. Palu City which is the center of government and economic heart of Central Sulawesi Province affected by the disaster recorded 1,649 people died, 2,549 people were injured, 265 were missing and 152 were estimated to be buried and have not been evacuated due to the incident. This caused the paralysis of Palu City from various aspects, there were around 62,359 inhabitants in refugee camps, 66,926 houses were thought to be damaged. Various problems especially in the health sector that arise at this time actually do not need to occur if the community plays an active role in accordance with their respective roles ranging from awareness of maintaining personal health, family, environment, health program planning and supervision. The Healthy Life Community Movement Program (GERMAS) launched by the government through Presidential Instruction No. 1 of 2017 is basically a public health effort through community empowerment. Community empowerment in the health sector is the main target of health promotion. Community empowerment is one of the global strategies for health promotion so that community empowerment is very important to do so that the community as the primary target has the will and ability to maintain and improve health.

At the initial stage, GERMAS began with a focus on three activities, namely carrying out 30 minutes of physical activity every day, consuming vegetables and fruit and regular health checks at least once every 6 (six) months as an early detection effort disease. These three activities can be started by yourself and your family.

Thus an analysis of community empowerment is needed in the implementation of GERMAS in the post-disaster area of Palu City. This study aims to analyze community empowerment in the implementation of GERMAS in the post-disaster area of Palu City.

**Material and Method**

This type of research is qualitative using a phenomenological study approach. A sampling of informants was carried out using a purposive sampling technique, namely determining the sample of research informants by means of deliberately selecting or appointing them to be informants. The subjects used as informants in this study were 10 (ten) people. The method in collecting data in this research is in-depth interviews, Focus Group Discussion (FGD), documentation.

Data obtained through in-depth interviews in this study were analyzed using content analysis. Content analysis involves a process designed to condense raw data into categories or themes based on valid conclusions and interpretations. The process of content analysis in qualitative research begins with data collection, to support the drawing of valid and reliable conclusions, the reduction of data tailored to the objectives of the study.

**Results**

**Empowerment Stage:** The results of research on community empowerment related to the analysis of the power supply stage can be listened to through the following in-depth interviews with informants:

Research questions about how to analyze the steps of the Power Giving Phase related to partnerships in the implementation of GERMAS in post-disaster areas in Balaroa Village?

"... During this time we are collaborating with the GALI GASA program, the K5 task force, PKK, BNN, including the Ministry of Religion, women empowerment, child protection, banking assistance, GERMAS is integrated with other parties ..."

"... Since we entered the emergency response, the post-disaster period, the transition period, the reconstruction and recovery period, we have done everything, besides GERMAS, there are also special treatments, health services, and reproductive health posts. So post 24-hour public health during the emergency response period. We cannot work alone because of limited manpower so that after the disaster many parties involved were involved there but continued to coordinate with the puskesmas because of our work area."

Research questions on how to analyze the steps for the Empowerment Phase in relation to budget support in implementing GERMAS in the post-disaster area of Balaroa Village?

"... In 2020, which is usually 50 people/village to 100 people/village. Last year needed 3 tents, now it needs 6 tents. Funding from the Regional Budget ..."

"... What is important is that if there is a listing of the director, there is a hook in the RPJMD, then every
year the budget will come out. The allocation last year was quite large because of the activities almost every week ... “

The excerpts from the interview results above explain that the budget support for GERMAS in the Palu City Health Office has increased but is not significant from previous years, where there are an increase of 2 (two) times the financing volume of 50 people every village to 100 people every village, from the needs of 3 (three) tents to 6 (six) tents. This is reinforced by the explanation of the Regional Development Planning Agency (BAPPEDA) of Palu City that the budget allocation for GERMAS is annually and is quite large.

Related to research questions about incentives for cadres in the implementation of GERMAS in the post-disaster area of Balaroa Village?

“... If from BOK 50 thousand/month. I have been given incentives starting from my work in 2011. Received quarterly .. “

“... Cadre incentives from our government, a month of 50,000 are received per quarter. So the officers here take the funds in the new service, we are here to channel ...

From the interview excerpt above that up to now the incentive for health cadres in Balaroa Village is budgeted by the Palu City Health Office and then distributed by Sangurara Health Center every quarter of Rp. 150,000 (one hundred and fifty thousand Rupiah) every quarter.

Related to research questions regarding the evaluation of the implementation of GERMAS in the post-disaster area of Balaroa Village?

“... Activity reports start from Integrated healthcare center (posyiandu) cadres, village health post (poskesdes), and community leaders who were completed in the public health center (puskesmas) report. In addition, around 4-5 community groups have been formed which independently carry out activities related to GERMAS without any intervention from the local government, community awareness to conduct clean and healthy lifestyles is better, formed Community-Based Health Efforts (UKBM), and before the disaster, residents had already grown vegetables and chilies in their own yards.

**Discussion**

Community empowerment in the health sector is more aimed at increasing community participation in the health sector. Community participation is the activity of involving the community in a program. It is expected that with high community participation, a health program can be more targeted and have greater leverage for behavior change because it can create a value in the community that the health activities are from us and for us.

Community empowerment is an effort or process to foster awareness, willingness and ability of the community to recognize, overcome, maintain, protect, and improve their own welfare. Community empowerment in the health sector is an effort or process to foster awareness of the willingness, and ability to maintain and improve health.

The Healthy Life Community Movement Program (GERMAS) is a systematic and planned action taken jointly by all components of the nation with awareness, willingness, and ability to behave in a healthy manner to improve the quality of life. GERMAS can be done by doing physical activities, consuming vegetables and fruits, not smoking, not consuming alcohol, checking health regularly, cleaning the environment, and using the toilet.

The interview excerpt above explained that the evaluation of the implementation of GERMAS was reported in the form of reports by Integrated healthcare center (posyiandu) cadres, village health post (poskesdes) and community leaders who were completed in the public health center (puskesmas) report. In addition, around 4-5 community groups have been formed which independently carry out activities related to GERMAS without any intervention from the local government, community awareness to conduct clean and healthy lifestyles is better, formed Community-Based Health Efforts (UKBM), and before the disaster, residents had already grown vegetables and chilies in their own yards.

Based on the results of research on the analysis of community empowerment in implementation GERMAS conducted in Balaroa Village, Palu City, shows a picture of the implementation of community empowerment through stages. The discussion of these stages is described as follows:

**Empowerment Stage:** The stage of giving power itself or empowerment. At this stage, the authority is
given to identify the problem and the right strategy to overcome the problem of community empowerment in implementing GERMAS. Community empowerment activities at this stage appear in the form of partnerships, utilization of potential and resources, integration of activity programs and evaluations in the implementation of the GERMAS.

Explore and develop the potential of each community member so that they can contribute according to their ability to jointly planned programs or activities. Community contribution is a form of community participation in the form of energy, thoughts or ideas, funds, building materials, and other facilities to support health businesses.

According to Sari and Sulistiowati, the tasks of the public health center (puskesmas) are so numerous and not possible to be done by the public health center (puskesmas) themselves, it needs support from various parties. A partnership is one of the important health promotion strategies to be implemented, which must begin with the identification of community leaders in order to form a tiered and sustainable partnership. The implementation of GERMAS in all villages in the city of Palu is integrated with the Gali Gasa Program which is also a priority and priority program in the city of Palu.

In addition, the provision of incentives for health cadres in every community empowerment activity related to GERMAS carried out in Balaroa Village has been carried out by the Palu City Health Office through the Sangurara Health Center by providing incentives of Rp. 150,000/quarterly. According to the research results of Bhattacharayya et al., 2001, giving awards in the form of cash to cadres does have an advantage. The advantage of money as a cadre incentive can be asked to work longer hours to achieve certain goals, supervision can be carried out strictly so that the program can be implemented quickly, regular work routines and service quality can be maintained, negative reinforcers such as dismissal or punishment that can be used to encourage desired performance and payments are also seen as helping to build economic equality in populations that lack economies. In line with this, the WHO (World Health Organization) sees the need for cadre payments as a long-term program sustainability effort.

Even so, the provision of incentives in the form of cash causes a weak sense of volunteerism from cadres. Wirapuspita revealed that monetary incentives can improve the performance of cadres, but the incentive management system by the government can reduce the voluntary nature of cadres and weaken community empowerment. Bhattacharya et al., incentives in the form of money have losses, which can lead to jealousy and hostility if not all CHWs (Community Health Workers) or other communities that work are paid, thereby damaging their commitment and their relationship with the community. CHWs (Community Health Workers) those who receive salary or wages can see themselves as government employees or NGOs rather than as community servants.

Based on the results of the study, it is important for posyandu managers and coaches, both at the village office, sub-district, public health center (puskesmas), health offices and city government levels to consider giving and managing money incentives to cadres, so that the provision of incentives can be on target and the desired goals can be achieved.

**Conclusion**

At the power supply stage in the implementation of the Healthy Life Community Movement Program (GERMAS) in the post-disaster area of Balaroa Village in the aspect of partnerships in the form of collaboration with various cross-sectors, integration with other priority programs such as GALI GASA, coordination with all stakeholders involving community leaders, youth leaders, and K5 task force. From the aspects of the budget in the form of budget allocation in every financing activities of the Healthy Living Movement Program (GERMAS) and providing incentives for cadres. From the evaluation aspect of the activity in the form of a final report on the activities of the Healthy Living Community Movement Program (GERMAS) that has been carried out, the residents of Balaroa Village have been cultivating vegetables and other plants in their respective yards.

**Conflicts of Interest:** None

**Source of Funds:** Self

**Ethical Clearance:** Health Research Ethics Committee, Faculty of Public Health, Universitas Hasanuddin.

**References**


Design and Guidelines for Early Stimulation to Optimize Toddler Development in Maritime Communities in Kelurahan Lapulu Abeli Puskesmas Working Area in Kendari City

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Abstract

The first three years of a toddler is a golden period for optimal brain growth and development. Growth and development of infants will be in line with the optimal age increase, if appropriate stimulation is carried out routinely, this study aims to analyze the effectiveness of early stimulation guidelines to optimize the development of infants in maritime communities. This research method is a quasi experiment with pre and post test design with control group. The population in the study were all toddlers with a sample of 30 people (case group of 15 people and control of 15 people). Sampling is done by simple random sampling. Data were analyzed using paired T-Test to analyze differences in development before and after the administration of early stimulation, and pooled T-Test to analyze the effect of early accumulation on toddler development by comparing the development between case groups and control groups. The results of the study found that the provision of early stimulation was effective in optimizing the development of children under five in the maritime community in Posyandu, Lapulu Village, the working area of Abeli Puskesmas, Kendari City in 2018.

Keywords: Early Stimulation, Toddler Development, Maritime Society.

Introduction

To achieve good human qualities, it is necessary to foster children as early as possible from the womb, the age of the child, until the child becomes an adult. Toddlerhood is a period that really determines the quality of human resources, because the growth and development of children is determined by the condition at the time of infancy. Toddlerhood is often stated as a critical period in order to get quality human resources, especially in the first 3 years period is a golden period for optimal brain growth and development. The development of the ability to speak in toddlers with the language of creativity, social awareness, emotional and intelligence goes very fast. Growth and development will be in line with the normal increase in age if routinely given the appropriate stimulus, so that toddlers will grow and develop normally as well, so that it will increase human resources in the future.

Comprehensive and quality child development is carried out through stimulation activities, and early interventions for toddler growth and development. Toddler development is greatly influenced by guidance from parents by providing stimulation in the form of guiding the toddler, so that development can be in accordance with the age of the toddler. Early Childhood Growth and Development (SDDTK) stimulation and detection is carried out to get quality children. A simple means of monitoring growth and development is the Pre Development Screening Questionnaire (KPSP). Monitoring efforts are made to stimulate development by following up the complaints of parents related to the growth and development problems of infants and toddlers.

Method and Method

This research is a quasi-experimental research with a pre-post test with control group design. This design aims to determine the effectiveness of early stimulation guidelines after being given an intervention or treatment on a variable, then the results of the treatment are compared with the control group, i.e. the group that is not subject to treatment.
This study compared the intervention group for early stimulation in infants as a treatment group with the group that did not intervene as a control group. This study uses two measurements, namely before and after the intervention. Measurements made before the intervention (O1) are called pretest, and measurements made after the intervention (O2) are called posttest. 7

The population in this study were healthy toddlers who did not experience health problems during the last 3 months as many as 118 people in the PudaiKelurahan and Lapulukelurahan, the Abeli Health Center in Kendari City. Sampling of toddlers as many as 15 intervention groups and 15 control groups with regard to matching age groups, and gender. Retrieval of initial observation data (pre-test) by measuring the development of infants using the KPSP Ministry of Health 2014 measurement tools before giving early stimulation. Provision of intervention by training toddler mothers to do early stimulation of development accompanied by the provision of a media booklet that contains technical instructions on how to do stimulation to mothers of toddlers 8,9.

Results

The results showed that maternal education with the highest frequency of secondary education was 16 people (53.3%) and low frequency was S1 as much as 1 person (3.4%) (Table 1).

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intervention</td>
<td>Control</td>
</tr>
<tr>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Mother’s education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary</td>
<td>7</td>
<td>46,7</td>
</tr>
<tr>
<td>Intermediate</td>
<td>7</td>
<td>46,7</td>
</tr>
<tr>
<td>High</td>
<td>1</td>
<td>6,7</td>
</tr>
</tbody>
</table>

The distribution of toddlers’ development in the intervention group before the early stimulation intervention of toddler development all doubted 15 people (100%), and after the early stimulation intervention, the development was appropriate for 15 people (100%). Table 2.

<table>
<thead>
<tr>
<th>Development</th>
<th>Interventions Before</th>
<th>After</th>
<th>Control Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponds</td>
<td>0</td>
<td>15</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Doubt</td>
<td>15</td>
<td>0</td>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>

Analysis of differences in infant development showed that the average under five development in the intervention group before the early stimulation intervention was 7.87 ± 0.352. After the intervention, it becomes 10.0 ± 0.000. Paired t test showed that there were differences in the development of children under five before and after the intervention for early stimulation, namely the average development of children under five after an early stimulation intervention was higher than before the intervention (p = 0.000; α = 0.05).
The average development of children under five in the control group before the early stimulation intervention was $7.73 \pm 0.458$. After the intervention, it became $8.47 \pm 0.743$. Paired t test showed there were differences in the development of children under five before and after the stimulation intervention, the average development of children under five after an early stimulation intervention was higher than before the intervention ($p = 0.001; \alpha = 0.05$). (Table 3).

<table>
<thead>
<tr>
<th>Groups</th>
<th>Development</th>
<th>n</th>
<th>Mean±SD</th>
<th>Mean Different</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interventions</td>
<td>Before Interventions</td>
<td>15</td>
<td>7.87±0.33</td>
<td>2.13</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>After Interventions</td>
<td>15</td>
<td>10.0±0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>Before Interventions</td>
<td>15</td>
<td>7.73±0.74</td>
<td>0.45</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>After Interventions</td>
<td>15</td>
<td>8.47±0.74</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results showed there were differences in development between the intervention group and the control group after the intervention was given early stimulation ($p = 0.000; \alpha = 0.05$). This shows that there is an influence of early stimulation on the development of children under five in the maritime community in LapuluKelurahan, the area of the Abeli Health Center in Kendari City in 2018.

Table 4. Analysis of Differences in Toddler Development between the interventions group and the control group after the provision of early stimulation in the Posyandu in the Lapulu sub-district, the working area of the North Sumatra Community Health Center in 2018

<table>
<thead>
<tr>
<th>Groups</th>
<th>Development</th>
<th>n</th>
<th>Mean±SD</th>
<th>Mean Different</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interventions</td>
<td></td>
<td>15</td>
<td>10.0±0.0</td>
<td>1.53</td>
<td>0.000</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>15</td>
<td>8.47±0.74</td>
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</tbody>
</table>

**Discussion**

Good education and supported by a good nurturing environment, good mother-child interaction through nurturing greatly affect the development of good children. Development requires stimulation/stimulation, especially in the family, for example the provision of toys, child socialization, involvement of mothers and other family members in children’s activities.¹⁰

The link between education and the mother’s knowledge in providing early stimulation to her child is also supported by the results of research that found that there is a relationship between maternal knowledge about infant growth and development stimulation with the development of toddlers aged 12-36 months in Posyandu Kasihibu Banyu UripKlego Boyolali.¹¹

Children who are entrusted in TPA have better development than those raised by parents because TPA has good parenting standards, has professional caregivers, a comfortable and attractive place, and there is a complete play area to stimulate toddler development. Basically, all activities in TPA are intended to stimulate children to meet the optimal development needs.¹²

This is in line with the opinion which says that in parents with a high and good education, parents can receive well all information from outside, especially how to care for children properly and healthier. This is in line with the results of research on the relationship between the level of parental knowledge about stimulation and gross motor development of children aged 0-5 years in BumiAji Village, Anak Tuha Subdistrict, Central
Lampung Regency. As a result, there is a relationship between parents’ knowledge about stimulation and gross motor development in children aged 0-5 years.\textsuperscript{13}

The level of education of respondents with high frequencies in high school education was 16 people (53.3\%) and the presence of higher education (S1) of 1 person (3.4\%) contradicts the opinion that the characteristics of coastal communities that lack education, slums, tend to let children develop with less than maximum stimulus and greatly affect the cognitive, personality, physical, emotional, social development of coastal children.

Nutritional factors have a big influence on children’s growth and development so they cannot be underestimated. Fulfillment of children’s nutritional needs must also be supported by the active role of parents, an environment that stimulates all aspects of child development, and is also supported by the active role of children.\textsuperscript{14} Environmental factors include aspects of physical needs, aspects of compassion (compassion), and aspects of care (education and relationships). Secondary education with good relationships will support children’s development as well.\textsuperscript{10}

1. Toddler Development Before and After Early Stimulation Giving Interventions: The results of this study indicate that there are differences in the development of toddlers in the provision of early stimulation which is indicated by the increase in development that is in accordance with the age of all toddlers in the intervention group after giving early stimulation.

An increase in development is appropriate for all respondents in the case group after an early stimulation intervention for 15 days continuously every day, this indicates the importance of providing early stimulation, especially in infants to stimulate optimal development. The optimal development of infants will determine the optimal future of children and also better in the future.

Every child needs regular stimulation as early as possible and continuously at every opportunity. Stimulation of child development is carried out by parents, people closest to the child, surrogate mother or child caregiver, other family members and other adults. In this study, of the 15 respondents as controls also found that there were 10 respondents (66.7\%) who did not experience growth despite the increase in age, and still remained in the category of dubious development. Less optimal development that occurs in the control group is caused by suboptimal early stimulation done to the toddler. This finding is in line with the opinion that psycho-social development is greatly influenced by the environment and interactions between children and their parents. Child development will be optimal if social interaction is maximally pursued in accordance with the needs of children at various stages of development.\textsuperscript{15}

Provision of stimulation is more effective when paying attention to children’s needs in accordance with the stages of child development to the fullest. In the early stages of development the child is in the sensory motor stage. Giving visual stimulation to children will increase children’s attention to their environment, children will be happy by laughing and moving their whole body so that it will stimulate all sensory body to develop optimally, both physically, psychologically and socially.\textsuperscript{16,17}

2. Provision of Effective Early Stimulation to Influence Toddler Development in Maritime Communities: The results showed that there were developmental differences between the intervention group and the control group after the intervention was given early stimulation (p <0.05). This shows that the provision of early stimulation is effective to optimize the development of toddlers in the maritime community in Posyandu, Lapulu Village, the working area of Abeli Health Center, Kendari City in 2018.

This is confirmed by research on 30 mothers who have babies aged 0-1 years in the Kemayoran District of Surabaya. The act of maternal stimulation of infant gross motor development in the good category. The better the stimulation action given by the mother, the better will be the effect on the normal and appropriate gross motor development of the baby.\textsuperscript{18}

In this study, it was found that all respondents (100\%) experienced optimal development after routine early stimulation for 15 days with a continuous carried out by mothers of toddlers has a positive effect on improving the development of toddlers. This is evident from the results of the study found that in infants who get early stimulation on a regular basis every day every time the child needs to show optimal improvement in development.

**Conclusion**

Preparation of guidelines for early stimulation
to optimize the development of children under five in the maritime community in Posyandu, Lapulu Village, the working area of Abeli Puskesmas, Kendari City. The compiled guidelines refer to the guidelines for early stimulation in KPSP (Pre Development Skrening Questionnaire) Children at the Basic Service Level (Kemenkes RI, 2014) and adjust to the characteristics of the maritime community with their daily activities as fishermen. There is a difference in the development of toddlers in maritime communities in Lapulu Kelurahan in the area of Abeli Puskesmas in Kendari City in 2018. Provision of early stimulation is effective in optimizing development in toddlers in maritime communities in Posyandu in Lapulu Kelurahan in the Abeli Puskesmas working area in Kendari City in 2018. This is shown after early stimulation all in the intervention group were in the appropriate development, whereas in the control group there were still largely in the doubtful development.

**Ethical Clearance:** Taken from University ethical committee

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**

Analysis of Factors Affecting the Workload of Health Workers in the Namrole Public Health Center and Wamsisi Public Health Center in South Buru Regency

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Abstract

The workload on health workers in Public health centers can be seen from aspects such as tasks that are carried out based on their main functions. The purpose of this study was to analyze the factors that influence the workload of health workers in the Namrole Public health center and the Wamsisi Public health center in South Buru Regency. This type of research is a quantitative cross-sectional study design. The population in this study were all health workers with the status of civil servants who worked in the Namrole Public health center as many as 73 officers and Wamsisi Public health center as many as 27 officers. The sampling technique in this study was proportional random sampling to obtain a sample of the Namrole Public health center as many as 58 officers and Wamsisi Public health center as many as 22 officers. The results showed that there was no influence of the level of education on the workload of health workers in the Namrole Public health center and the Wamsisi Public health center in South Buru regency (p = 0.622 > 0.05). Working time significantly affected the workload (p = 0.000 < 0.05) and years of service are protective factors for the workload of employees at the Namrole Public health center and the Wamsisi Public health center in South Buru regency (p = 0.053 > 0.05). To the Regional Government of South Buru Regency to emphasize more regulations related to working hours, especially for employees at public health care centers, so that they are able and comfortable to carry out their duties and functions effectively and efficiently with optimal work time and not excessive.

Keywords: Workload, work time, Wamsisi Public Health Center, Namrole Public Health Center.

Introduction

Workloads on healthcare personnel in public health centres can be seen from aspects such as tasks that are executed based on their main functions. Tasks that carried out include basic tasks, additional tasks/double, the number of patients who should be served, the working capacity in accordance with the education of health workers, the working time used to work on the task in accordance with the working hours of the day, as well as the completeness of facilities that can help the health workforce in solving their work well.1

The Public health Center is a healthcare facility that organizes public health efforts and first-rate individual health efforts, with a greater emphasis on promotive and preventive efforts, to achieve the highest degree of public health in its working area2.

Based on the results of the research Nafizta, showing the calculation and analysis of the workload of...
the nurses using the work sampling method resulted that
the workload on 6 working days of nursing workers in
the public health center Poncol differ. Nursing personnel
workloads are the highest on Mondays and Thursdays
during long working hours, while for short working
hours the highest workload of caregivers is on Saturday.  

Namrole Public Health Center and Wamsisi Public
Health Center are two public health centres located in
the South Buru regency. Namrole Public Health Center
and Wamsisi Public Health Center is a health service
with inpatient unit based on the visit data that is obtained
shows that patients who come to the public health center
are many and tend to increase, since the NHI era, number
of visits in Namrole Public Health Center in 2018 as
many as 13,858 patients and in 2019 as of October
17,157 patients 4 Meanwhile, in the Public health center
of Wamsisi in 2018 as many as 7,556 patients and in the
year 2019 as of October 4,934 patients 5. The aim of the
study was to analyse the factors affecting the workload
of healthcare personnel at the Namrole Public Health
Center and the Public Health center of South Buru
Regency.

Materials and Method

This research uses quantitative research method
of cross sectional study design. The population in this
research is all health officers who are the status of
civil servants who work in the Namrole Public Health
Center, which is 73 officers and the Public health center
of Wamsisi is as many as 27 officers. The sampling
technique in this study is proportional random sampling
so that the information obtained by the Namrole Public
Health Center is as many as 58 officers and the Public
health center of Wamsisi is as many as 22 officers. Data
collection is obtained through a live interview using a
questionnaire.

Results

Based on table 1 shows respondents who are 26–35
years more than 55 people (68.8%), while the respondents
are the least in the age group of 18-25 who are 9 people
(11.2%). According to the gender the number of female
respondents was more than 69 people (86.2%), while
male respondents were only 11 people (13.8%) While
based on the working area of the number of respondents
working in the Namrole Public Health Center as many as
58 people (72.5%), while the respondents who worked
in Wamsisi public health centers as many as 22 people
(27.5%).

<table>
<thead>
<tr>
<th>Characteristics of Respondents</th>
<th>Amount (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Age (yr)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-25</td>
<td>9</td>
<td>11.2</td>
</tr>
<tr>
<td>26-35</td>
<td>55</td>
<td>68.8</td>
</tr>
<tr>
<td>36-45</td>
<td>16</td>
<td>20.0</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>b. Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>11</td>
<td>13.8</td>
</tr>
<tr>
<td>Girl</td>
<td>69</td>
<td>86.2</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>c. Working area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Namrole public health center</td>
<td>58</td>
<td>72.5</td>
</tr>
<tr>
<td>Wamsisi public health center</td>
<td>22</td>
<td>27.5</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: 2020 Primary Data
Table 2. Effects of education, work time and work period on workloads Namrole public health center and Wamsisi public health center 2020

<table>
<thead>
<tr>
<th>Research variable</th>
<th>Light</th>
<th>Weight</th>
<th>Total</th>
<th>P.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>High</td>
<td>54</td>
<td>72</td>
<td>21</td>
<td>29</td>
</tr>
<tr>
<td>Low</td>
<td>3</td>
<td>60</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>71.3</td>
<td>23</td>
<td>26</td>
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<tr>
<td>Working time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>44</td>
<td>93.6</td>
<td>3</td>
<td>6.4</td>
</tr>
<tr>
<td>Abnormal</td>
<td>13</td>
<td>39.4</td>
<td>20</td>
<td>60.6</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>71.3</td>
<td>23</td>
<td>28.7</td>
</tr>
<tr>
<td>Years of service</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enough</td>
<td>49</td>
<td>89.1</td>
<td>6</td>
<td>10.9</td>
</tr>
<tr>
<td>Less</td>
<td>8</td>
<td>32.0</td>
<td>17</td>
<td>68.0</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>71.3</td>
<td>23</td>
<td>28.7</td>
</tr>
</tbody>
</table>

Table 2 shows that from 50 respondents that the variable is located from 80 respondents there are 75 people who are highly educated, who are 54 people (72%) Of those who felt a mild workload and 21 people (28%) The rest feels its burden is quite heavy. Meanwhile, out of 5 low-educated respondents were 3 people (60%) That feels it has a lightweight workload and 2 people (40%) have heavy workloads. Statistical test result X² Fisher’s Exact Test obtained the value P = 0.622 or value p > 0.05, thus Ho accepted and Ha rejected. So it can be concluded that there is no meaningful relationship between the level of education and the workload of health workers in the Namrole public Health Center and Wamsisi Public Health center in 2020.

Based on the working period variable table 2 shows that from 80 respondents there were 55 people who had sufficient employment, of which 49 people (89.1%) Of those who felt a mild workload and 6 people (10.9%) The rest feels its burden is quite heavy. As for 25 respondents who have a less working period, there are 8 people (32.0%) That feels it has a lightweight workload and 17 people (68.0%) Others feel that the workload is quite heavy. The test result of the Ikchi-square Statistic is derived from the value p = 0.000 or P value < 0.05, thus Ho rejected and Ha accepted, so that there is a meaningful relationship between the working time with the workload of health care in the Namrole public Health Center and the Wamsisi public health center in 2020.

Discussion

Effect of education on workload: From the analysis results with the X² statistical test Likelihood Ratio obtained the value P = 0.622 (P > 0.05), thus there is no link between the level of education with the workload. It is in accordance with the research of Umamah which proves that there is no link between the level of education and the workload. The research is also in line with the findings of Veny Yuliani (2017) which proves there is no link between the level of education and the workload with the value P = 0.17 > 0.05.

Meanwhile, Maryam (2017) states that performance is heavily influenced by the internal factors of workload
i.e. education level. This is because the higher the mastery of one’s intellectual degree, the more it is open ability to increase the productivity of its work. In addition to the higher level of education of a person, the likelihood of analyzers in addressing problems is also higher.

**Effect of working time on workloads:** Everyone has been stressed and will experience it, but the levels vary and within the same period. Nurazizah states that stress is a thorough response from both physical and mental bodies to any demands or disturbing changes, threatening security and individual self-esteem.

Working in a public health center in every opportunity will meet patients with varying characteristics that impact different conditions and workloads. For that, Nurses should act as all-round personnel, have initiatives, behave creatively and have a broad insight with the motivation of hard work, intelligent, sincere and quality work. The types of patients who are hospitalized or treated in an inpatient room can be viewed as a claim to health care if not managed properly, it will result in stressful work.

The results of this research in line with the research of SrieWulandari, et al. (2017) said that the workload in the Emergency Instaltance space is heavy because it has to do the treatment of patients who come quickly and precisely. According to research Nurazizah is known to occur decrease in overall brain function. With a tool that can display the picture of the brain using advanced technology, it is found that more severe damage occurs in areas responsible for attention, complicated planning, complex mental processes and on the area of decision making.

The excess sleep time also poses a problem, theoretically if the body is too much sleep, then blood circulation becomes slow. The impact will be about the whole body, because metabolism will also slow down. If it happens for a long time then the condition will cause a variety of problems. According to him, shift work affects health in the first 5 (five) years, called the adaptation phase.

**Effect of working period on workload:** Through analysis with the Chi-Square test obtained the value $P = 0.000$ ($P < 0.05$), thus there is a relationship between the working period and the workload. The results of this study are in line with the findings of Zulkifli, DKK (2018) stating that the longer working life is closely related to the experience and understanding of the better job description. This experience and understanding will assist in addressing the problem (stresor) that exist in the prevention of stress due to excessive workload.

Meanwhile, the results of this research are contrary to the research results of VennyYuliandi which says that there is no relationship between the working period and the workload with the value $P = 0.91$ ($p > 0.05$). This is due to the longer the working period, the greater the burden and responsibilities of the employees. The difference in workers whose work period is less than 5 years still needs self-adjusting with the working environment and any work risk that can occur. Because of the negative impact for a company if it gives a mental workload too high or too low for employees, it provides special attention to the right mental workload for its employees. Additionally, respondents who experienced the dominant heavy workload have been working long enough (> 5 years). It can be assumed in addition to the effect of demands on speed of work, thoroughness and prudence there are also other factors that cause heavy workload that is also boredom due to the destruction of the work.

In overcoming the boredom of work because the specialization of work is required the right solution. Changing tasks can increase the stimulation of mental workers or passions, as well as the involvement of their duties, so that it can improve performance within the company. Many companies do a variety of work boredom prevention measures to make workers not feel bored with the activities that must be done daily, by conducting work rotation, involving workers in decision making, conducting the meeting of all employees, giving the opportunity to do leave, and many other things. All these activities aim to prevent or reduce the boredom of work on employees.

**Conclusion**

The research concluded that there was no level of education on the workload of healthcare personnel at the Namrole Public Health Center and the WamsisiPublic Health center of the South Buru regency ($p = 0.622 > 0.05$), the working time significantly affects the workload ($P = 0.000 < 0.05$) and the working period is a protective factor against personnel workloads in the Namrole Public Health Care Center and the wamsisiPublic Health center of the South Buru regency ($p = 0.053 > 0.05$). To the local government of South Buru Regency to be more emphasized regulation related to working hours.
especially for employees at the Public health Care center, so that they can afford and comfortably fulfill their duties and functions effectively and efficiently with optimal uptime and not excessive

Ethical Clearance: Taken from University ethical committee.

Source of Funding: Self

Conflict of Interest: Nill

References

Al-Qoran Views of Tobacco Smoke Exposure on Pregnant Women

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Abstract

Smoking has become a serious problem for all nations of the world. The threat of the adverse effects of smoking on the health of pregnant women has shown an adverse effect. Pregnant women affected by tobacco smoking may give birth to low birth weight babies (LBW), preterm birth and stillbirth. The religion of a person can play a role in changing the attitude of a society towards bad actions. The teachings of Islam through verses of the Koran teaches to create environmental conditions that are appropriate for a pregnant woman. Achieve safety in the fabric of human life through prevention of negative behaviors that lead. Realizing a healthy family environment situation. Creating a harmonious family full of happiness and meeting physical and spiritual needs.

Keyword: Tobacco smoke, pregnancy, Qoran, pregnant outcome.

Introduction

Smoking has become a global public health problem. Since the beginning of the 20th century tobacco smoke consumption has increased throughout the world. Around 1.1 billion people aged 15 years and over are smokers. Smoking not only has an effect on active smokers but also has the potential to be a health disorder for those around them exposed to cigarette smoke.¹² According to the World Health Organization (WHO) in the Global Tobacco Epidemic report, smoking is a global health problem that causes death in 5 million people every year.³⁴ The adverse effects of smoking on pregnancy are widely known, the prevalence of smoking in women has decreased in high-income countries in 50 years, but the prevalence has increased in middle and low income countries.⁵⁶

Passive smoking is estimated to cause death in 1.0% of the world’s population, 603,000 deaths in children and adults and the number is increasing every year. Secondary smokers are people who are exposed to cigarette smoke from the environment (environmental tobacco smoke, ETS).⁷ Exposure to secondary tobacco smoke during pregnancy is often associated with various health problems for mothers and the babies. Various studies have shown pregnant women who are exposed to cigarette smoke increase the risk of babies born. Pregnant women exposed to tobacco smoke have the possibility to give birth to low birth weight babies (LBW), give birth pretermly and stillbirth.⁸–¹² Exposure to tobacco smoke during pregnancy also increases the risk of babies born with Respiratory distress syndrome.
Medico-legal Update, October-December 2020, Vol. 20, No. 4

(RDS), being treated in intensive neonatal care and early neonatal complications.\textsuperscript{13}

Religion also pays serious attention to the effects caused by smoking. The religious teachings adopted by a pregnant woman also have a strong influence on her pregnancy. That research shows 47\% rate believes that spiritual is very influential on a pregnant woman’s pregnancy. This indicates that religious teachings are the most important part and basic needs in pregnancy. Islam based on the Qur’an Surah Maryam verse 16 contains instructions to Maryam who will enter the labor process. Mary is a symbol of the role of a woman who is pregnant must do something positive for herself. Self-protection Maryam who is pregnant is part of the teaching of protection against external interference that can endanger her and prepare herself carefully in accepting her responsibilities as a mother.

**Effect of Smoking on Health:** Cigarettes contain a variety of harmful substances including nicotine, cotinin, cadmium carbon dioxide, asbestos, arsenic, benzene and radon gas.\textsuperscript{14,15} Nicotine is a water-soluble bioactive alkaloid with parasympathomimetic effects and addictive substances. Nicotine is obtained from the leaves and stems of the tobacco plant Nicotianatabacum which originates from North and South America. Tobacco was later introduced to Europe for pleasure effects and some medical benefits.\textsuperscript{16}

Exposure to secondhand smoke significantly increases the risk of lung cancer in adult smokers and increases the risk of asthma, lower respiratory tract infections and decreases lung function in children. Smoking increases the risk of apnea during sleep and exacerbation of asthma in the adult population and pregnant women. Active and passive smokers increase the risk of tuberculosis infection.\textsuperscript{17}

**Tobacco Smoke Exposure on Pregnant Women:** Pregnant women who are exposed to cigarette smoke from the environment or passive smokers have the potential to be a health problem in the community, about 22-30\% of non-smokers women are exposed to cigarette smoke from the environment.\textsuperscript{18} Data from other studies show that 37\% of pregnant women are passive smokers.\textsuperscript{19} Nicotine is a major component of smoking, its effects on pregnancy have been found in several studies.\textsuperscript{1}

Nicotine and carbon monoxide can cause various disorders for the fetus, ranging from disorders of the placenta to disorders of the fetal circulation.\textsuperscript{9,14,20,21} Smoking during pregnancy is not only dangerous for the mother but also the fetus in her womb.\textsuperscript{22} Smoking in pregnancy can cause preterm birth, miscarriage, ectopic pregnancy, antepartum bleeding, placenta previa, small babies for gestational age, small baby head circumference, increased risk of low birth weight babies (LBW) and congenital anomalies. The effects of smoking on pregnancy that cause adverse effects on birth are well known, but the effects of pregnant women as passive smokers have not been so widely studied and understood.\textsuperscript{18}

Pregnant women are an active risk group for cigarette smoke both actively and passively. ETS smoke is a complex mixture consisting of most of the smoke emitted from the smoker’s body plus the smoke produced by burning cigarettes and the surrounding air.\textsuperscript{2} Exposure to ETS in pregnant women causes increased levels of CO, nicotine and cotinin in maternal serum or urine, in infants and in amniotic fluid. The influence of ETS on pregnant women can occur from the first semester to the third semester. Pregnant women are usually exposed to ETS in various places with different duration of time. Places that have the potential to become ETS exposure locations include at home, at work and the outside environment.\textsuperscript{10}

The physical environment has an important role in determining the weight of babies born and their health in the future. Research in Jordan shows that ETS exposure in non-smoking pregnant women causes an increased incidence of low birth weight babies (LBW). Increased ETS exposure increases the risk of LBW infants. All ETS exposure in the home, office and outside environment has the potential to reduce the weight of babies born. It was also found that second and third semester exposures were the most vulnerable time of exposure causing LBW. LBW infants tend to be more at risk for neurological problems including cerebral palsy, seizures, severe mental retardation, respiratory diseases and other morbidity.\textsuperscript{10} Research shows that smoking during pregnancy increases the risk of preterm birth by 25\%.\textsuperscript{6}

ETS exposure also specifically has an influence on preterm birth.\textsuperscript{23,24} Smoking is known to cause an increased risk of spontaneous and elective preterm birth, but has a stronger relationship with spontaneous preterm birth. Passive smoking in pregnancy also has a risk of preterm birth both spontaneous and elective.\textsuperscript{20} Elective preterm delivery is likely to be related to cigarette-
related obstetric complications such as placenta previa, placental abruption and impaired fetal growth. Research shows that smoking during pregnancy increases the risk of preterm birth by 25%. ETS exposure also specifically has an influence on preterm birth.

Smoking can also increase the risk of preterm rupture of membranes through several mechanisms, namely: (1) smoking decreases immunity and becomes a predisposing factor for infection, (2) smoking decreases copper levels and ascorbic acid in the blood. The micronutrients can cause a decrease in the elasticity of the membranes and increase the risk of rupture of the membranes. Both of these mechanisms have the potential to cause preterm birth.

The Quran Views Of Smoking: Based on the negative effects of smoking in the order of human life, the Quran forbids all forms of actions that lead to harm and adverse effects of a human action or policy (QS. Al-Baqarah; 2: 195). This proposition becomes the basis for the prohibition of all human attitudes and actions that can threaten his survival. The teachings of the Quran require human life in good condition. Every part of his life must avoid evil and harm and survival threaten. In Surah al-Nahl verse 97 explains that everyone who does a joint activity, then positive things must be a priority in the environment:

Whoever works righteousness, man or woman, and has Faith, verily, to him will We give a new Life, a life that is good and pure and We will bestow on such their reward according to the best of their actions.

The teachings in this verse are aimed at all people without having to distinguish roles in the sex in doing good. The responsibility of doing good is an obligation that must be done for those who believe if they want to perfect their faith. Salih is the opposite of alfasad (bad or error). Positive deeds, salih must be a priority scale for humans. Because salih is a real thing in human life, it should be the spearhead in the order of life.

The Qur’an requires human life in the circumstance of thayyibah. Hayatanthayyibah is a picture of a life that deserves goodness. The state of life that meets the healthy requirements and meets both the material, psychological and spiritual needs so as to create a good and comfortable life without being overwhelmed by anxiety and boredom. Good and comfortable are not based on the availability of material, so the material will not affect/damage the desire for religious obligations.

The Quran And Tobacco Smoke Exposure On Pregnant Mother: The goal as a family is to be achieved is the realization of the sakinah, mawaddahwarahmah as revealed in surah Arrum verse 21: that God has planted the potential in each family to live happily, meet each other’s needs and maintain harmony with one another.

And among His Signs is this, that He created for you mates from among yourselves, that ye may dwell in tranquillity with them, and He has put love and mercy between your (hearts): verily in that are Signs for those who reflect.

Life is full of peace with the pronunciation of Yaskunu in the above verse using the verb expression, giving a signal that the family must keep trying to find and maintain peace in family life so that all the hearts of family members are always calm. The word mawaddah in the context of this verse means love and love for all life activities and gives birth to a sense of comfort. Family members must have a good relationship, a sense of caring gives birth to a safe and loving situation, mercy.

A pregnant woman with the responsibility of maintaining the health of the fetus (hifz al-nasl) it contains is very dependent on a healthy environment. A healthy environment will play an important role in creating a comfortable situation and giving birth to high-quality offspring and a person is not justified in making efforts to eliminate the comfort of others, including in the family. Conversely, in an environment that threatens the lives of women and fetuses due to smoking, which is conceived, stated: “If a man kills a believer intentionally, his recompense is Hell, to abide therein (For ever): And the wrath and the curse of Allah are upon him, and a dreadful penalty is prepared for him.” (Al-Nisa [4]:93), “And those who annoy believing men and women undeservedly, bear (on themselves) a calumny and a glaring sin.” (Al-Ahzab [33]: 58).

Conclusion

Various studies showed that smoking has a negative effect on the mother and the baby. Stillbirth, preterm birth and malnutrition in infants are the effects of tobacco smoke on pregnant women. The adverse effects of smoking can threaten human life, the Quran prohibits all forms of actions that lead to harm and adverse effects of an action or human policy (Surah Al-Baqarah; 2: 195). This proposition becomes the basis for the prohibition of all human attitudes and actions that can threaten his survival. The teachings of the Koran require...
human life in good condition and benefits. Whatever is a part of his life must avoid evil and harm, and threaten human survival. In Surah al-Nahl verse 97 explains that everyone who does joint activities,

**Ethical Clearance:** Taken from University ethical committee

**Source of Funding:** Self

**Conflict of Interest:** Nil

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The Association between Diabetes Mellitus and Serum Prostate-Specific Antigen Levels

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Abstract

**Background:** Diabetic patients were indicated to have an improved risk for cancers of the liver, pancreas, and colon; nevertheless, recently many studies have suggested that diabetes mellitus (DM) decreased possibility for developing the cancer of prostate in men.

**Objective:** To analyze if the levels of prostate-specific antigen (PSA) in serum of men with type two DM were low in comparison with healthy group, and to investigate the factors that could influence the PSA level in diabetic patients.

**Method:** 120 diabetic men patients were analyzed for PSA levels in the serum compared with equal number age-matched control group. The relationships between the serum PSA levels and body mass index (BMI), age, hypertension, smoking and glycosylated hemoglobin (HbA1c) were considered.

**Results:** Serum PSA levels were statistically significantly (p<0.05) lower in diabetic patients compared to healthy men. The present study demonstrated that age, BMI and high HbA1c showed independent determining factors of the PSA level in men.

**Conclusions:** Our study strongly support that DM has inverse relationship with the levels of PSA marker and more severe cases of diabetes mellitus, older age and high body mass index in diabetic patients are associated with lower levels of the serum PSA. This result confirms that diabetes mellitus is a protective factor for prostate cancer among populations.

**Keywords:** Diabetes mellitus, PSA, prostate cancer.

Introduction

Diabetes mellitus (DM) and various cancers are commonly diagnosed in the same persons(¹), which suggest that the two diseases may have common risk factors and pathogenesis. The possible links include insulin resistance, hyperinsulinemia, hyperglycemia, oxidative stress, and chronic inflammation; which are factors that have potential promoting effect on the progression of cancer in many ways(²,³).

Many studies have stated that patients with diabetes mellitus are at high risk of many types of cancers, including liver and pancreatic cancers, and the two organs have a major role in the pathogenesis of diabetes mellitus(⁴).

Different studies consistently report type two diabetes mellitus is inversely related the cancer of the prostate(⁵,⁶), but not all studies have reached to this conclusion(⁷).

The mechanisms for these paradoxical associations are not clear. Several studies reported that increased duration since diagnosis of type two DM decreases the risk of prostate cancer(⁸) and there is some suggestion that prostate cancer risk is increased in the years immediately after the diagnosis of DM(⁶,⁹).
Measuring the PSA is the most useful available tumor marker for the diagnosis of the cancer of the prostate (10). It is commonly used for screening of the cancer of the prostate cancer (11).

Although there are variable recommendations, the age of 50 years is suggested by several organizations for PSA screening (12).

**Method**

The study was conducted on 120 previously diagnosed type 2 diabetic men with age ranging from 38-70 years old and 120 age matched normal healthy control men. Patients with type 2 DM were selected from the diabetic clinic and outpatient clinics of urology with no urological disease that may affect the PSA level at Al-Ramadi teaching hospital and Al-Yarmook teaching hospital, and the controls were healthy volunteers, between October 2016 and April 2018. Type two DM was diagnosed according to the American Diabetes Association (ADA) criteria for the diagnosis of diabetes mellitus 2010 (13).

The controls should be never diagnosed with type 2 diabetes. A written consent was taken and ethical approval was obtained from Al-Anbar Medical college ethics committee.

The collection of data were based on structured questionnaires.

Men with evident prostatic disease (like prostate cancer, benign prostatic hypertrophy and prostatitis) and men with history of type 1 DM were excluded from this study.

The hemoglobin A1c (HbA1c) was used as a marker of glycemic control. Its level is used as indicator of glycemic control within the past 3 months (14). The HbA1c levels less or equal 6% was considered normal and 6.1% to 7% as high, and we used 6.1% as cutoff value, which was adopted by Bennett et al. (15) to diagnose patients with diabetes mellitus. The height and weight were measured to calculate the patient’s BMI, BMI of < 25 was considered as normal weight, BMI of >25 and <30 as overweight, and BMI of >30 as obese (16). Waist circumference was also measured.

The blood samples were used for the measurement of the PSA and HbA1c . The PSA levels were measured using Minividas Machine using its costume kit. HbA1c analyses were done (NycoCard™ HbA1c). All measurements were done at Al-Ramadi Teaching Hospital Laboratory according to the instructions of the manufacturer.

**Statistical Analysis:** ANOVA test was used to analyze the statistical differences between group means and McNemar’s test for comparison of proportions, also chi square was used for comparing categorical variables. Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS version 24) software.

**Results**

The age of subjects enrolled in this study ranged from 38 to 70 years with mean of 61.59 and 60.20 year in cases and in control group respectively, there was no significant statistical difference between the age, the prevalence of smoking and family history of prostatic cancer among the two groups. Table (1).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Groups</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age/years ± SD</td>
<td>61.59±8.97</td>
<td>60.20±9.68</td>
</tr>
<tr>
<td><strong>Age distribution N/%</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 50</td>
<td>15/12.5</td>
<td>17/14.2</td>
</tr>
<tr>
<td>50 – 59</td>
<td>40/33.4</td>
<td>38/31.7</td>
</tr>
<tr>
<td>&gt;60</td>
<td>65/54.16</td>
<td>65/54.16</td>
</tr>
<tr>
<td>Body Mass Index/(kg/m2) ± SD</td>
<td>25.34±2.48</td>
<td>24.19±2.62</td>
</tr>
<tr>
<td><strong>Body mass index distribution N/%</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 25</td>
<td>16/13.4</td>
<td>75/62.5</td>
</tr>
<tr>
<td>25 – 30</td>
<td>59/49.2</td>
<td>34/28.4</td>
</tr>
<tr>
<td>&gt;30</td>
<td>45/37.5</td>
<td>11/9.2</td>
</tr>
</tbody>
</table>
There was a highly significant statistical difference in the mean PSA level among the three studied age groups of cases, while no statistical difference among the controls. Independent to other factors the BMI was inversely related to the mean PSA level in both groups with statistically significant difference. Table (2).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Groups</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cases</td>
<td>Controls</td>
</tr>
<tr>
<td>Smokers N/%</td>
<td>44/36.7</td>
<td>52/43.4</td>
</tr>
<tr>
<td>Hypertensive N/%</td>
<td>71/59.2</td>
<td>37/30.8</td>
</tr>
<tr>
<td>Family history of prostate cancer N/%</td>
<td>9/7.5</td>
<td>8/6.6</td>
</tr>
<tr>
<td>Hb A1C(%)± SD</td>
<td>7±1.50</td>
<td>4.9±0.99</td>
</tr>
<tr>
<td>Mean PSA(ng/ml)± SD</td>
<td>1.122±0.118</td>
<td>1.400±0.142</td>
</tr>
</tbody>
</table>

The mean PSA was not statistically different in smokers compared to nonsmokers in the cases but was lower in smokers compared to nonsmokers in the controls with statistically significant difference. Table (3)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cases (N)</th>
<th>Mean PSA (ng/ml)±SD</th>
<th>P value</th>
<th>Controls (N)</th>
<th>Mean PSA (ng/ml)±SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body mass index (kg/m²)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 25</td>
<td>16</td>
<td>1.260±0.089</td>
<td>0.000</td>
<td>75</td>
<td>1.437±0.133</td>
<td>0.039</td>
</tr>
<tr>
<td>25 – 30</td>
<td>59</td>
<td>1.126±0.105</td>
<td>0.000</td>
<td>34</td>
<td>1.367±0.127</td>
<td>0.000</td>
</tr>
<tr>
<td>&gt; 30</td>
<td>45</td>
<td>1.067±0.102</td>
<td>0.018</td>
<td>11</td>
<td>1.245±0.121</td>
<td>0.029</td>
</tr>
<tr>
<td>25 – 30</td>
<td>59</td>
<td>1.126±0.105</td>
<td>0.018</td>
<td>34</td>
<td>1.367±0.127</td>
<td>0.029</td>
</tr>
<tr>
<td>&gt; 30</td>
<td>45</td>
<td>1.067±0.102</td>
<td>0.018</td>
<td>11</td>
<td>1.245±0.121</td>
<td>0.029</td>
</tr>
<tr>
<td>Age distribution/years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 50</td>
<td>15</td>
<td>1.230±0.106</td>
<td>0.025</td>
<td>17</td>
<td>1.376±0.152</td>
<td>0.932</td>
</tr>
<tr>
<td>50 – 59</td>
<td>40</td>
<td>1.138±0.123</td>
<td>0.000</td>
<td>38</td>
<td>1.392±0.136</td>
<td>0.678</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>65</td>
<td>1.080±0.101</td>
<td>0.000</td>
<td>65</td>
<td>1.411±0.143</td>
<td>0.815</td>
</tr>
<tr>
<td>50 – 59</td>
<td>40</td>
<td>1.138±0.123</td>
<td>0.034</td>
<td>38</td>
<td>1.392±0.136</td>
<td>0.815</td>
</tr>
<tr>
<td>&gt; 60</td>
<td>65</td>
<td>1.080±0.101</td>
<td>0.034</td>
<td>65</td>
<td>1.411±0.143</td>
<td>0.815</td>
</tr>
</tbody>
</table>

Regarding duration of DM, no significant difference. Table (4).
Table (4) The association of duration of diabetes mellitus and HbA1c with the mean PSA level in cases group.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number</th>
<th>Mean PSA(^{\text{ng/ml}}) ± SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb A1C(%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 6 (Normal)</td>
<td>30</td>
<td>1.232±0.108</td>
<td>0.000</td>
</tr>
<tr>
<td>6.1 – 7 (High)</td>
<td>47</td>
<td>1.109±0.120</td>
<td>0.000</td>
</tr>
<tr>
<td>&gt; 7 (Very high)</td>
<td>43</td>
<td>1.023±0.0869</td>
<td></td>
</tr>
<tr>
<td>6.1 – 7</td>
<td>47</td>
<td>1.109±0.120</td>
<td>0.001</td>
</tr>
<tr>
<td>&gt; 7</td>
<td>43</td>
<td>1.023±0.0869</td>
<td></td>
</tr>
<tr>
<td>Duration of DM (Years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 - 5</td>
<td>33</td>
<td>1.127±0.120</td>
<td>0.978</td>
</tr>
<tr>
<td>6 -10</td>
<td>47</td>
<td>1.122±0.119</td>
<td>0.889</td>
</tr>
<tr>
<td>&gt; 10</td>
<td>40</td>
<td>1.114±0.118</td>
<td></td>
</tr>
<tr>
<td>6 -10</td>
<td>47</td>
<td>1.122±0.119</td>
<td>0.963</td>
</tr>
<tr>
<td>&gt; 10</td>
<td>40</td>
<td>1.114±0.118</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

The cancer of the prostate is the second most frequently diagnosed cancer of men and the sixth most common cause of cancer mortality among men worldwide (17). In most Asian Countries, the incidence of cancer of the prostate has increased during the last two decades (18).

Saad et al. have suggested a mechanism for the occurrence and progression of type two DM consisting of two-parts (19).

Testosterone is varied by the status of DM and its duration and prostate cancer is the only cancer that is believed to be fueled by testosterone.

Another hypothesis adopted recently is related to microvascularization, of the prostate, where the damage to the blood vessels of the prostate, as a part of DM complications, prevents the development of prostate cancer (20).

Shi et al., demonstrated that the blood level of insulin-like growth factor-I was more in patients with prostate cancer than in controls (21).

So, in the early stage of abnormal metabolism of glucose and development of type two DM (the step of insulin resistance), the risk of the cancer of the prostate may be increased due to elevated levels of insulin and this is consistent with many studies that have examined the risk of the cancer of the prostate and duration of diabetes mellitus since the diagnosis (22) which have found an increased risk in the early stage followed by inverse association in the later stage.

Our results are largely consistent with other study (23) that found there was no significant difference by duration of DM.

However, the duration of diabetes mellitus is a parameter which is difficult to be determined because 50% of patients with type two diabetes mellitus may be undiagnosed (24), and the estimated duration of diabetes mellitus may be related to the degree of medical follow up.

It is well known that as increasing ages, the PSA level will naturally increases by about 3.2% per year (25). Richardson and Oesterling suggested age-specific reference ranges for the serum PSA level in men of different races after reviewing multiple studies (25).

In controls, our results shows that the serum PSA level was found to be significantly increased with age and it is consistent with various Asian populations based studies conducted among China, south India, Korea, Singapore, and Japan (26), while in diabetics as the age increased, the mean PSA level was decreased especially among men aged 60 and over, which similar to that reported by Ainahi et al. (27).

Despite of statistically non-significant relationship between BMI and the PSA level seen in a smaller-scale study (28), Our findings in both cases and controls are
consistent with the findings of an inverse association between BMI and the PSA levels, where there is 5% to 21% decrease in the PSA value in men with BMI more than 30 in comparison with men with normal BMI as seen in several large-scale studies(29). The relevant reduction in the PSA level might be attributable to increased volume of the plasma found in the larger men(29) or due to less androgen levels seen in the obese and insulin resistant adult males (30).

Our findings are also consistent with the results of studies that examine the association with glycemic control in patients with T2DM. Müller et al reported that the serum PSA level is 15% and 29% lower in patients with HbA1c of 6.1–6.9% and ≥7% respectively, in comparison with those with normal HbA1c (<6.1%) (31).

Ohwaki et al suggest a positive association between HbA1c and the PSA(5.7% increase in the PSA for each unit HbA1c change), which is in contrast to many studies and our current study (32).

Similar to previous studies that reported the PSA level were significantly lower in smokers in comparison to non-smokers men who are over the age of 55 (33). We found the PSA level was significantly lower as compared with never smokers in the controls. In patients with diabetes mellitus, the PSA levels were mildly lower in smokers in comparison to non-smokers, but it was statistically nonsignificant.

Among the possible explanations for lower PSA levels in patients with type 2 diabetes mellitus is hypertension (34), and this is inconsistent with our results.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding

**References**


Correlation of Ki 67, Histopathological Features and Shape of Lesion in Skeletally Mature Osteochondroma

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Abstract

Background: Osteochondroma represents the most common benign tumor of bones and accounts for about 30-50 % of them. Poor information’s in previous studies act on demonstration of the significance of atypical histological changes as a premalignant precursor in mature osteochondroma regardless of the cap thickness. In this study, the proliferative activity of cartilaginous cap will be studied in skeletally mature patients regardless of the cap thickness to demonstrate the independent significant of histological features in predicting the malignant potential in osteochondroma.

Methodology: Cases of skeletally mature osteochondroma (78 case) were isolated and separated into sessile and pedunculated, then into G1(without suspicious histological features) and G2 (with suspicious features), and stained with Ki- 67. Data were analyzed using SPSS version 21 and p value < 0.05 was considered as significant.

Results: There was significant association between study groups and Ki 67 staining results, majority (75%) of patients with suspicious histopathological features presented with positive results of Ki 67 staining (p value < 0.001). While there was no correlation between shape of lesion and histopathological features (p value 0.662).

Conclusion: A typical histopathological features can be regarded as independent factor with the other clinical data when considering the diagnosis of grade 1 chondrosarcoma.

Keywords: Osteochondroma, proliferative marker, atypical histopathology, lesion shape, Ki 67.

Introduction

Osteochondroma represents the most common benign tumor of the bony skeleton and accounts for about 30-50 % of them(1-2) some researchers regards this tumor as developmental abnormality rather than a true neoplasm. It may result from small fracture in the growth plate in skeletally immature bone and herniated through peristeal bone to form a tumor like lesion.(3-4) Pathologically, osteochondroma (also called exostosis) is composed of cartilaginous cap of hyaline type, covered with fibrous sheath that is continuous with the periosteum and it in turn covering an underlying bone and medullary cavity that is continuous with that of the parent bone.(5-6) This continuity with the underlying bone is important radiological feature in the diagnosis and it is more clear in pedunculated shape lesion than in sessile one. Development of osteochondroma in children whom treated with radiation for Wilm’s tumor due to separation and migration of physeal plate support the suggestion that osteochondroma is a tumor.
like condition\(^7,8,9\), on the other hand, presence of hereditary form of osteochondroma (hereditary multiple osteochondromatosis or called hereditary multiple exostosis HME) support the fact that osteochondroma is a true neoplasm\(^{10,11}\). HME comprise about 15 % of osteochondroma and caused by mutation in EXT1 or EXT2 genes that are located on chromosome 8 and 11 respectively\(^,12\). the most common location for osteochondroma is the metaphysis of long bones especially the lower limbs, flat bones are less commonly affected\(^,13\). this benign tumor usually affect children and adolescent and stop growing after skeletal maturity. Clinically, it may be silent or cause disfigurement, pain due to pressure on a nerve or blood vessel and fracture\(^14\), the serious complication of this neoplasm is malignant transformation, usually in form of secondary peripheral chondrosarcoma. Malignancy can complicate about 25% of HME and only 1-8 % of solitary exostosis\(^{15,16}\). At microscopy, the tumor composed of hyaline cartilage with lobulation, the chondrocytes are bland looking, evenly spaced and show ordered maturation in columns. The cartilage merges with the underlying bone that project from the bone of origin and continuous with it. Atypical histological features such as mild increased cellularity, occasional binucleation, more than one cell in the lacuna, and foci of necrosis are considered to be reactive changes in the growing cartilaginous cap and should not be overdiagnosed when the cap thickness is within usual\(^3-17\). the allowed cap thickness is up to 3 cm in children with immature skeleton and only few millimeters in skeletally mature adult\(^3-18\). Also new increased growth of exostosis in adult should raise the suspicion of malignant transformation into peripheral chondrosarcoma since osteochondroma is unusual to enlarge after maturity\(^,19\). Another features that should brought the attention is the proximal location of tumor such as around the pelvis or shoulder, grossly irregular surface, cystic changes and soft tissue invasion.

Chondrosarcoma arising in osteochondroma is usually of low grade as the trabecular bone permeation is usually absent, in addition, the cytological features may be bland with the exception of loss of columnar arrangement of the chondrocytes. This laid a hard work on the pathologist and necessitate clinico-radiological-pathological correlation for such a diagnosis\(^,19\). Eefting et al suggested a statistically significant pathological criteria that could distinguished low grade (G 1) chondrosarcoma from proximally located benign cartilaginous tumors\(^,20\). Such a histological features included increased cellularity, nuclear pleomorphism, mitosis, entrapment, mucoid changes and loss of normal cellular arrangement. These features are added to the clinical data including age of patient above 40 years, proximal location and radiological data. Few studies work on demonstration of proliferative activity of osteochondroma cartilage in children comparing with proliferative activity in premature growth plate and in adult using immunohistochemistry with Ki 67 antibodies\(^{21}\). Ki 67 is a nuclear non histone protein that is expressed in all phases of cell cycle with exception of G0\(^,22\). most articles focused on cartilage cap thickness as the main indicator of malignant transformation. However no enough previous studies act on demonstration of the significance of atypical histological changes as a premalignant precursor in mature osteochondroma regardless of the cap thickness. In this study, the proliferative activity of cartilaginous cap of osteochondroma will be studied in skeletally mature patients regardless of the cap thickness in order to demonstrate the independent significant of atypical histological features in predicting the malignant potential in osteochondroma. Also there will be a focus on the relationship between unusual histological features in osteochondroma (increased cellularity, occasional binucleation and mild pleomorphism) with shape of the lesion (sessile or pedunculated).

**Methodology**

Part of cases for study are collected from Al Hilla Teaching Hospital and Al-Hayat hospital retrospectively from the last 4 years (2015-2018). Cases with insufficient clinic-radiological data are ignored. The other part is selected prospectively from the work of orthopedic author (use of suitable longitudinal incision to expose the tumor, careful dissection with radical excision of osteochondroma from its base with the mother bone with its basal cortex to avoid recurrence). Exclusion criteria: osteochondroma from skeletally immature cases were excluded.

**Inclusion Criteria:** All skeletally mature osteochondroma regardless of cartilage cap thickness were included.

**Ethical Issues:** No patients identity or identifying photos are included in the study, so the permission of the institute, where the data are collected (including radiological and clinical information, as well as histological slides and paraffin blocks), is taken. The
The total number of collected cases was 130. Orthopedic author reviewed the radiological picture for each case and separate them into skeletally immature cases (excluded from the study) and skeletally mature cases (included), so the final number of cases was 78 case. Also the included cases were divided into sessile shape lesions and pedunculated shape lesions. All study’s cases were reviewed by two pathologists blindly from each other and without any clinical information. Cases are separated into group 1 (conventional osteochondroma with no atypical histological features) and group 2 (osteochondroma with atypical histology).

Atypical histology defined by presence of increased cellularity, binucleated chondrocytes, occasional more than one cell in the lacuna, and mild pleomorphism with absence of other features that raise the suspicion of chondrosarcoma such as irregular arrangement of chondrocytes (not in ordered columns), mitosis, marked pleomorphism, necrosis, permeation and marked myxoid changes and separation of cells into specific lobules by fibrous bands.

Cases of both groups are then stained immunohistochemically with MIB1 antibody (mouse monoclonal antibody, Dako 1:50). Three μm sections are cut, deparaffinized, rehydrated and stained with standard procedure. Heat induced antigen retrieval is used for all sections. Nuclear staining of Ki 67 was scored using the average method by manual counting of Ki67 positive cells in three representative sections for each case and calculating the average percentage of positive cells by two pathologists.

**Figure (1):** A An intra-operative picture of osteochondroma in 20 years old male show pedunculated shape tumor. B X-ray of 32 years old patient show osteochondroma in skeletally mature skeleton at lower femur and complicated by basal fracture. (our cases).

**Data Analysis:** Statistical analysis was carried out using SPSS version 21. Categorical variables were presented as frequencies and percentages. Pearson’s chi square ($X^2$) was used to find the association between categorical variables. A $p$-value of $\leq 0.05$ was considered as significant.

**Results**

**The Distribution of Patients According to Study Groups:** Figure (2) shows distribution of patients according to study groups including (group 1 osteochondroma without suspicious histo-pathological features and Group 2 osteochondroma with suspicious histo-pathological features). Majority (64.1%) of patients presented with osteochondroma without suspicious histo-pathological features.
The distribution of study groups according to Ki 67 staining results: Figure (3) shows distribution of study groups according to Ki 67 staining results including (Positive and negative). Majority (75%) of patients with osteochondroma with suspicious histopathological features had positive Ki 67 staining.

Figure (4): A osteochondroma in 25 years male with conventional histological features (group 1) show negative Ki 67 staining. B osteochondroma in 32 years old male with increased cellularity and occasional binucleation (group 2), show positive Ki 67 staining.
The Distribution of Study Groups According to Shape of Lesion: Figure (5) shows distribution of study groups according to shape of lesion including (pedunculated and sessile). More than a half of patients with osteochondroma in two groups had pedunculated shape of the lesion.

![Distribution of patients according to shape of lesion](image)

**Figure 5: Distribution of patients according to shape of lesion**

The association between study groups and study variables: Table (1) shows the association between study groups including (group 1 osteochondroma without suspicious histopathological features and Group 2 osteochondroma with suspicious histopathological features), and study variables including (Ki 67 staining results and shape of the lesion). There was significant association between study groups and Ki 67 staining results, majority (75%) of patients with suspicious histopathological features presented with positive results of Ki 67 staining (p value < 0.001), while there was no correlation between shape of lesion and histopathological features (p value 0.662).

**Table (1): Association between study groups and study variables including (Ki 67 stain results and shape of lesion)**

<table>
<thead>
<tr>
<th>Study variables</th>
<th>Study groups</th>
<th>Total</th>
<th>$\chi^2$</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group 1</td>
<td>Group 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ki 67 staining</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>3 (6.0)</td>
<td>21 (75.0)</td>
<td>24 (30.8)</td>
<td>40.11 &lt;0.001*</td>
</tr>
<tr>
<td>Negative</td>
<td>47 (94.0)</td>
<td>7 (25.0)</td>
<td>54 (69.2)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50 (100.0)</td>
<td>28 (100.0)</td>
<td>78 (100.0)</td>
<td></td>
</tr>
<tr>
<td><strong>Shape of lesion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pedunculated</td>
<td>26 (52.0)</td>
<td>16 (57.1)</td>
<td>42 (53.8)</td>
<td>0.191 0.662</td>
</tr>
<tr>
<td>Sessile</td>
<td>24 (48.0)</td>
<td>12 (42.9)</td>
<td>36 (46.2)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50 (100.0)</td>
<td>28 (100.0)</td>
<td>78 (100.0)</td>
<td></td>
</tr>
</tbody>
</table>

*P value ≤ 0.05 was significant. (group 1 osteochondroma without suspicious histopathological features, Group 2 osteochondroma with suspicious histopathological features).

**Discussion**

In a large studies reported by Mayo Clinic, it had been found that (81%) of secondary chondrosarcoma arose at site of previous osteochondroma\(^{(23)}\). It has been estimated that 2/3 of these cases derived from sporadic osteochondroma. Although osteochondroma is rarely (1-2%) transformed into chondrosarcoma, its recognition is of high importance because most of these
tumors are low grade and treated by adequate excision without need for chemotherapy or radiotherapy.\textsuperscript{(24)} Huch et al performed a study on a group of solitary osteochondroma and other group of patients with multiple osteochondroma, comparing the immunohistochemical expression of Ki-67 in both groups as a marker of nuclear proliferative activity. They found that the proliferative activity in osteochondroma from patients younger than 14 years of age is similar to that in postnatal growth plate, while in individuals older than 14 years there was no significant detectable proliferative activity\textsuperscript{(21)}. So, in the current study the only skeletally mature cases are included to avoid such overlap in the results of immunohistochemical staining with Ki-67. In a study of de Andera et al, only cellular pleomorphism and mitotic activity show significant difference between osteochondroma and low grade chondrosarcoma on one hand and high grade chondrosarcoma on the other hand. While other cellular features as binucleation, necrosis, and irregular calcification was found in 72% of osteochondroma.

K.Huch et al supported the concept of increased suspicion for malignant transformation in osteochondroma of adult when Ki 67 positivity is detected.\textsuperscript{(21)}

The shape of osteochondroma (pedunculated versus sessile) was not studied previously regarding their relation to the microscopical features that raise the suspicion about malignancy (increased cellularity, frequent binucleation, nodularity and necrosis). We found that no relation between the shape of the lesion and such a histological features. However the shape of the lesion may affect the accuracy of radiological diagnosis of osteochondroma (more difficult in sessile tumors) as mentioned previously by Mark D. Murphey.\textsuperscript{(2)}

**Conclusion**

Histopathological features, when atypical, can be regarded as independent alarming factor for malignant transformation (the same as cartilage cap thickness and may precede it). There is no relation between shape of osteochondroma and risk of atypical histological features, proliferation, and hence risk of malignancy.

**Acknowledgment:** We are grateful for lab staff in Al-Hilla Teaching Hospital and Al- Hayat hospital for their help in data collection.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

**References**

9. Jaffe N, Ried HL, Cohen M, McNeese MD, Sullivan MP. Radiation induced osteochondroma...
Effect of Tamoxifen Drug on Testes of Albino Male Rats

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Abstract

This study was conducted to evaluate the negative effects of Tamoxifen (TAM) on Testis tissues and spermatogenesis. Use for this purpose forty male of mature albino rats were divided into 4 equal groups, 3 groups were administrated different doses (30, 40, 50) mg/kg b.w of TAM for 10 weeks as well as control group administrated with physiological solution (normal saline 0.9%). Histopathological examination of testes tissues in TAM groups showed histological changes that increased with the increased dose compared to control group include degeneration change were appeared as atrophy, deformity and destruction of the seminiferous tubules, congestion of blood vessels in the interstitial tissue and many seminiferous tubules. Also the results showed a significant different in the numbers of spermatogonia, primary spermatocytes and spermatiods. As noted in the results, the higher the dose, the lower the sperm production, and consequently the tissue injury increases.

Keywords: Tamoxifen, Testis, Seminiferous tubules; physiological solution; blood vessels.

Introduction

Tamoxifen is a drug used to prevent breast cancer in women and to treat breast cancer¹,². Studies are under way to use it to treat other types of cancer. It has been used in the treatment of McCune-Albert syndrome. Tamoxifen is usually taken by mouth for five years to treat breast cancer³,⁴.

Tamoxifen is used in many medical fields, the most important of which is under study, this research aim to treat male and female infertility. Females with ovarian disorders after achieving success in treating breast cancer and gynecomastia in men⁵,⁶. TAM has been used in the treatment of infertile men with idiopathic infertility, oligospermia, and nonobstructive⁷.

The testis manufactures estradiol, via enzyme aromatase. Estradiol receptors (ER), alpha (α) and beta (β) in various testicular cells that plays important roles in male reproduction such as differentiation of germ and somatic cells, spermiogenesis, spermiation, maturation, transport and motility of spermatozoa, secretory activity of efferent ductulus, scrotal testicular descent and long-term fertility. Estrogen receptors in the Leydig and Sertoli cells presumably play an important role in the paracrine regulation of spermatogenesis. The hypothalamus, pituitary, epididymis and the and Sertoli cell, Leydig cells are important components of the male reproductive system⁸,⁹.

Estrogen receptors (ER) are existent in the testis, efferent ductules and epididymis, yet, ERα is plentiful in the efferent ductule epithelium, its primary function is the regulated expression of proteins involved in fluid reabsorption¹⁰.

Tamoxifen has serious side effects, being a chronic treatment and a selective receptor for estrogen receptors) Selective estrogen receptor modulators), It is from the group of Triphenethylene¹¹. It has been proven in several experiments that tamoxifen works on estrogen receptors in the testes, accessory glands, and hypothalamic-pituitary axis after administration in adult male rats¹².

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Tamoxifen induced a decrease in testosterone hormone, ruptured the testicular seminiferous epithelium, and induced the formation of multinucleated cells in the testis\(^{13}\).

Estrogen concentrations within the testicle and semen can reach high levels due to tamoxifen, estrogen synthesis in the male reproductive in Sertoli cells but then only in Leydig cells\(^{14}\).

The aim of the study was to identify the histological damage that occurred in the testes of rats that dosed tamoxifen in different doses and to know the amount and size of histological damage, especially in the spermatic tubules and sperm cells.

**Materials and Method**

**Experimental Animal:** The experimental animals used in this study were male albino rats weighing (200 – 250 g). The animals were purchased from Pharmaceutical control of the Ministry of Health in Baghdad. Animals were given food and water *ad libitum*. Rats were maintained in a friendly environment with a 12 h/12 h light-dark cycle at room temperature (25 °C\(^{15}\)).

**Experimental Design:** A total 40 of male rats were divided at random into 4 groups of 10 animals each group and treated as following:

- **Group I (control):** Animals were administrated orally with normal saline (0.9 %) 4 times/week for 10 weeks.
- **Group II (treated):** Animals were administrated orally with TAM (30mg/kg) 4 times/week for 10 weeks.
- **Group III (treated):** Animals were administrated orally with TAM (40mg/kg) 4 times/week for 10 weeks.
- **Group IV (treated):** Animals were administrated orally with TAM (50mg/kg) 4 times/week for 10 weeks.

After anesthetizing the animal, rats were dissected, testes were excised, washed with normal saline 0.9 % (NaCl), placed in fixative solution (neutral buffered 10% formalin) for histological examination. The preparation of histological sections was performed on standard method of\(^{16}\). At last the sections were examined by light microscope under magnification power (40x,20x). Photographs were taken.

**Statistical Analysis:** Results were expressed as Mean ± standard Error of the Means (SE). The Statistical analysis system applied using one-way (ANOVA) analysis variance to verify the Least significant differences (LSD) design. All figures were drawn using the Statistical package for prism 8.1.2 (version 8.1.2, Graphpad, San Diego, CA, USA) software. The probability (p) value of less than or equal to 0.05 has been considered to be of Statistical significance.

**Results**

**Histopathological Examination:** The histopathological examination showed several changes in the testis of treated animals compared with control group (Fig.1). These changes include congestion of blood vessels in the interstitial tissue (Fig. 2).

The degenerative changes in seminiferous tubules were appeared as atrophy and deformity of seminiferous tubules with large spaces between them. Some degenerated tubules showing the capsule were empty consist of basement membrane with no germinal layers and disappearance of spermatogonia, spermatocytes, spermatids and Sertoli cells (Figure 3).

While the testis tissue in the third group (50 mg) showed more severe lesions form previous groups which include severe edema in the interstitial tissue with complete losses of spermatogenesis with vacuolation of epithelial. in addition, the seminiferous tubules appear with irregular basement membrane with absence of spermatids (Figure 4).

**Figure (1): Cross section in the testis of control animal shows normal architecture of the spermatocytes (H & E 20 X).**
Figure (2) : Microscopic section in the testis of animals treated with TAM (30 mg/kg b.w.) shows congested of Blood vessels with edema in the interstitial tissue. (H & E 20 X).

Figure (3): Histopathological section in the animal treated with TAM (40mg/kg b. w.) shows congestion of blood vessels, while many seminiferous tubules under the capsule were empty consist of basement membrane with no germinal layers (H & E 40X).

Figure (4): Histopathological section in the group (50 mg/kg b. w.) showed seminiferous tubules appears with irregular basement membrane with absence of spermatids (H & E 10X).

The count of spermatogenic cells: The count of spermatogenic cells showed significant different number of spermatogonia, primary spermatocyte, spermatids and Sertoli cells in the three groups of experiment as compared with control group (fig. 5).
Discussion

In view of the results of the current study there is a significant decrease in the number of Sertoli cells, primary spermatocytes cells and spermatogonia when treated with TAM and elevation increased as the dose multiplied increased by the level of (30, 40, 50)mg/kg compared to the control group and this is consistent with what the researchers said\(^{16, 17, 18}\).

Tamoxifen increases LH and FSH in the case of a lack of testosterone in the body responsible for sperm synthesis. LH stimulates Sertoli cells in the testicle to produce testosterone. A drug works to improve the epididymis work on the maturity of sperm and does not affect its synthesis because it has no effect inside the testicle and also works to inhibit the Pituitary gland - Adrenal gland axis (HPA axis) and thus increase each of LH, FSH to produce testosterone. But if the dose amount as in this study gradually increased to reach the highest concentration, it leads to a decrease in the production of LH due to estrogen receptors in the testicle especially Leydig cell, which reduces spermatocytes count, and thus fertility decreases down to the condition of sterility, as well as the influence of Sertoli cells (Fig. 5)\(^{19, 20, 21}\).

Estrogen synthesis in the male in Leydig cells of the adult in Sertoli cells during tests. There is a consistent presence of aromatase in Leydig cells show activity in Sertoli cells of the adult testis. Aromatase activity is a marker for Sertoli, Tamoxifen has an aromatase inhibitor effect that prevents the conversion of androgens into estrogen, which is important for the maturity and shape of sperm\(^{22}\).
The testis produces estradiol, via enzyme aromatase, and can acts locally through selectively expressed estradiol receptors (ER, (α) and (β)) in various testicular cells. It plays several important roles in male reproduction, such as differentiation of germ and somatic cells, spermiogenesis, spermatiation, maturation, transport and motility of spermatozoa, secretory activity of efferent tubules, scrotal testicular descent and long-term fertility(8,23).

The microscopic examination of histological sections of the Testes treated with TAM showed clear tissue changes can be achieved with congested Blood vessels, edema in the interstitial tissue also atrophy and deformity of seminiferous tubules with large spaces between them with incomplete spermatogenesis and vacuolation of epithelial layer as well many seminiferous tubules under the capsule were empty consist of basement membrane with no germinal layers, complete losses of spermatogenesis with vacuolation of epithelial layer in addition the seminiferous tubules appears with irregular basement membrane with absence of spermatids, destruction of the seminiferous tubules and this is consistent with previously reported results(8,22,23).

It did not match the research, which says not to change the shape and size (18).

Testes injury because of oxidative stress, through conversion to electrophiles, nucleophiles and redox-active reactants, has a direct toxic effect and causes cellular dysfunction. Oxidative stress is considered as the important factor in the development of a variety of human complications that result from over production of ROS and impairment in the biological defense system. ROS interact with the renal mitochondrial membranes producing large amounts of oxygen radicals that cause deterioration of the testis’s architecture. Oxidative stress leads to the formation of vasoactive mediators as in the bloody congestion of the testicle tissue. This further leads to the morphologic al changes(24,25).

The decreased estrogenic effect due to tamoxifen may be directly responsible for decreased testicular expression of aromatase, which in turn may be responsible for the decreased synthesis of estradiol in the testis. Estrogen acts as a regulator of the proliferation/apoptosis balance, especially in germ cells, Moreover, the decrease of testosterone secretion in tamoxifen-treated rats could worsen the effects of decreasing estrogen synthesis. Testosterone regulates some genes supporting the complex development of germ cells(26,27,28).

**Conclusion**

The results of the present study revealed that the administration of TAM with increasing doses of 20mg for a long period of time and without regularity leads to weak sperm and a few in it number and cause infertility in addition to large and evident tissue changes in the composition of the testicle and its cells.

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Estimation of Some Immunological Markers of Iraqi Patients in Systemic Lupus Erythematosus with Lupus Nephritis

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Abstract

Background: The chronic autoimmune inflammatory, systemic lupus erythematosus (SLE), is a disease that may be caused by autoantibody production, complement activation, and immune complex deposition. Several organs can be affected by this disease; lupus nephritis which considers the most complication that may be occurred. The aim of our study is to establish if that serum sVCAM-1 and IL-18 can be applied as biomarker for diagnosis of LN and CKD in patients with SLE.

Method: One hundred twenty patients from both sexes were enrolled in this study. The subjects have been divided into three groups, group one and group two represent the patient groups that include, (40) patients SLE with LN (8 male-32 female) with age range (19-44) years for the group one, (40) patients SLE without LN with age range (16-45), for the group two. The third group includes (40) healthy subjects with age range (19-62) years, which represent the control group. VCAM-1 and IL-18, were estimated by ELISA method.

Results: The results referred to present high level of VCAM-1 and IL-18 in patients group that represent a complication case of SLE in comparison with patients group without complication “without LN”. At the same time, the results showed significance increasing of VCAM-1 and IL-18 in both patients groups rather than control group. Also, this study revealed a significant correlation (p<0.01) between VCAM-1 and IL-18, but no correlation with other relevant factors.

Conclusion: The results revealed the elevation of both sVCAM-1 and IL-18 levels in patients with SLE. Furthermore, this study indicates the association between the mentioned biochemical factors and suggests being as a useful indicators for LN in patients with SLE.

Keywords: SLE, VCAM-1, IL-18, LN; Iraqi Patients.

Introduction

Complications of SLE include a wide range of disorders for numerous organs. Lupus nephritis considers the main disease that may be occurred as a result of action SLE(1). Chronic inflammation were investigated in many cases in previous our studies(2,3). The facilities of cell adhesion molecules (CAM) include adherence of leukocyte and control their movement into inflame tissues(4).

Leukocyte circulation and lymphoid cells can be adjusted and allowed to adhesion on specific tissues or inflammation sites by vascular cell adhesion molecule-1 (VCAM-1). There are three types of adhesion molecules that include: integrins selectins(5) and immunoglobulin

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The supergene family (IGSF). The molecule-1 (ICAM-1) and the molecule-1 (VCAM-1) of vascular cell adhesion belong to the supergene family of immunoglobulins (IGSF), they are response for many cytokines such as IL-1 and TNF. Soluble forms of these molecules are discarding from endothelial cell surfaces and are easily measurable in serum\(^6\). At the same time, these soluble forms represent the most abundant of the circulating adhesion molecules at maximum dissimilarity levels with numerous inflammatory disorders. The highest level of these soluble adhesion molecules is found in patients with SLE and rheumatoid arthritis in comparison with healthy subjects \(^7\). On another hand, levels of sVCAM-1 have been found to associate with the activity of inflammation disease as in SLE rather than other soluble adhesion molecules. Several studies were proposed that urinary sVCAM-1 useful as a good marker for inflammatory diseases\(^8\).

Dendritic cells and macrophages consider the main source to produce IL-1α, IL-B and IL-18, which belong to Interleukin-1 family cytokines. Furthermore, IL-18 involved in pathogenesis of inflammatory disease, thus, it becomes of importance in association with a wide range of inflammatory diseases especially SLE.\(^9\) Previous studies referred to that, the exogenous IL-18 mice administration increased the incidence of sickness and nephritis, while IL-18 decreased improved survival and proteinure in the mice rather than in the healthy community. Moreover, few studies were revealed that IL-18 level increase in patients with SLE. Furthermore, the association between severity disease and IL-18 was confirmed\(^10\).

**Subjects and Method**

One hundred and twenty patients from both genders who attended Baghdad Teaching Hospital/Medical City Iraq from December 2018 to May 2019 were involved in this study. The subjects have been grouped into three categories: forty SLE patients with LN (8 male-32 female) with age range (19-44) years, forty SLE patients without LN, age range (16-45) and forty healthy subjects with age range (19-62) years.

Patients with SLE (without renal involvement) were clinically diagnosed with examination markers (Antinuclear Antibody ANA. Anti-double-stranded DNA [dsDNA], C3, C4 were done by immunological method), SLE with LN (biopsy approved) patients. Using (5ml) disposable syringe between (8.30-12) AM, five ml of venous blood was taken from subjects. Four ml from the sample was transferred to the sterile plain tube enable to clotted and then centrifuged for 15 min at 3000 rpm.

Serum was dispensed in several aliquots and frozen at -20°C immediately before analyzed the immunological and biochemical markers (Urea, total protein, Creatinine, C3, C4, Anit ds DNA, ANA and h-CRP by enzymatic and immunoturbidity method). The remaining blood samples (1ml) were transferred to EDTA tubes for hematological analysis (ESR). SVCAM-1 and IL-18 analyzed in the kit use enzyme-linked immune sorbent assay (ELISA) based on biotin double antibody sandwich technology.

**Statistical Analysis:** The system-SAS (2012) software for statistical analysis was used to detect the effect of differentiating factors on the study parameters. The least significant difference – the LSD test (Analysis of Variation-ANOVA) was used to make a significant comparison between the means. To significantly compare the percentage (0.05 and 0.01 probability), the chi-square test was used. Estimation of the coefficient of correlation between variables of difference in this study.\(^11\)

**Results**

Table 1 shows mean ± SD values for age, BMI, duration of SLE, urea, creatinine, total protein, Albumin C3, C4, ANA, Anti ds DNA, ESR and h-CRP. The results showed significant differences of age for the studied groups (p>0.01), while a significant increase in the body mass index (BMI), blood urea (BU), creatinine (Cr), ANA, Anti-ds DNA, ESR and h-CRP in groups of patients (SLE with LN, SLE without LN) were observed in comparison with control. In contrast, there was a significant decrease in total protein, Albumin C3, C4 in patient groups compared to healthy subjects.
Table 1: Clinical chartists “mean ± SD values for age, BMI, duration of SLE, urea, creatinine, total protein, Albumin C3, C4, ANA, Anti ds DNA, ESR and h-CRP”

<table>
<thead>
<tr>
<th>Factors</th>
<th>Control</th>
<th>SLE without nephrites</th>
<th>SLE with nephrites</th>
<th>LSD value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>41.02 ± 2.01 a</td>
<td>29.37 ± 1.25 b</td>
<td>31.05 ± 1.33 b</td>
<td>4.400 **</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>26.94 ± 0.40 b</td>
<td>28.54 ± 0.49 a</td>
<td>29.56 ± 0.61 a</td>
<td>1.438 **</td>
</tr>
<tr>
<td>Duration (year)</td>
<td>---</td>
<td>3.63 ± 0.19 a</td>
<td>6.11 ± 0.26 a</td>
<td>0.657 **</td>
</tr>
<tr>
<td>Urea (mg/dl)</td>
<td>23.47 ± 0.88 c</td>
<td>31.08 ± 0.63 b</td>
<td>57.98 ± 1.06 a</td>
<td>2.45 **</td>
</tr>
<tr>
<td>Total protein (mg/dl)</td>
<td>7.05 ± 0.17 a</td>
<td>6.66 ± 0.08 b</td>
<td>6.50 ± 0.08 b</td>
<td>0.348 **</td>
</tr>
<tr>
<td>Creatinine (mg/dl)</td>
<td>0.815 ± 0.04 b</td>
<td>0.887 ± 0.03 b</td>
<td>1.785 ± 0.06 a</td>
<td>0.139 **</td>
</tr>
<tr>
<td>C3 (mg/dl)</td>
<td>161.56 ± 5.13 a</td>
<td>90.81 ± 1.38 b</td>
<td>80.55 ± 1.33 c</td>
<td>8.86 **</td>
</tr>
<tr>
<td>C4 (mg/dl)</td>
<td>47.96 ± 3.10 a</td>
<td>23.23 ± 0.46 b</td>
<td>25.03 ± 0.78 b</td>
<td>5.23 **</td>
</tr>
<tr>
<td>ANitDNA (IU/ml)</td>
<td>10.66 ± 0.90 c</td>
<td>60.23 ± 1.39 b</td>
<td>75.48 ± 2.37 a</td>
<td>4.68 **</td>
</tr>
<tr>
<td>ANA (IU/ml)</td>
<td>1.264 ± 0.80 c</td>
<td>7.45 ± 0.34 b</td>
<td>19.01 ± 1.07 a</td>
<td>2.24 **</td>
</tr>
<tr>
<td>h-CRP (mg/l)</td>
<td>1.800 ± 0.15 c</td>
<td>9.32 ± 0.22 b</td>
<td>15.14 ± 0.60 a</td>
<td>1.077 **</td>
</tr>
<tr>
<td>ESR (mm/h)</td>
<td>4.88 ± 0.21 c</td>
<td>47.09 ± 0.85 b</td>
<td>57.84 ± 1.22 a</td>
<td>2.44 **</td>
</tr>
</tbody>
</table>

Table (2) shows a comparison between inflammation markers sVCAM and IL18 for the studied groups which are revealed significant correlation depending on the disease case compared healthy case (p<0.01)

** (P<0.01).

The study revealed that a significant correlation was found between sVCAM and IL18(r=0.45*), while there is no correlation found between others parameters, as shown in figure 1.

![Figure (1): The correlation between IL18 and sVCAM](image-url)
The study was found that serums VCAM, IL-18 levels in patients group without nephrites showed no correlation with other parameters as indicated in table (3).

**Table 3: shows correlation between sVCAM, IL-18 and biochemical parameters in SLE patients without nephrites.**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>sVCAM</th>
<th>P</th>
<th>IL18</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.07</td>
<td>0.627</td>
<td>0.04</td>
<td>0.805</td>
</tr>
<tr>
<td>BMI</td>
<td>-0.10</td>
<td>0.523</td>
<td>0.05</td>
<td>0.772</td>
</tr>
<tr>
<td>Urea</td>
<td>-0.13</td>
<td>0.392</td>
<td>-0.06</td>
<td>0.686</td>
</tr>
<tr>
<td>Creatinine</td>
<td>0.27</td>
<td>0.08</td>
<td>0.09</td>
<td>0.544</td>
</tr>
<tr>
<td>Total protein</td>
<td>-0.24</td>
<td>0.135</td>
<td>-0.07</td>
<td>0.627</td>
</tr>
<tr>
<td>Albumin</td>
<td>-0.06</td>
<td>0.697</td>
<td>0.02</td>
<td>0.884</td>
</tr>
<tr>
<td>h-CRP</td>
<td>-0.06</td>
<td>0.697</td>
<td>0.14</td>
<td>0.384</td>
</tr>
<tr>
<td>ESR</td>
<td>-0.33</td>
<td>0.034</td>
<td>-0.23</td>
<td>0.136</td>
</tr>
<tr>
<td>C3</td>
<td>0.03</td>
<td>0.861</td>
<td>-0.05</td>
<td>0.756</td>
</tr>
<tr>
<td>C4</td>
<td>-0.42</td>
<td>0.006</td>
<td>-0.28</td>
<td>0.072</td>
</tr>
<tr>
<td>Anti ds DNA</td>
<td>-0.21</td>
<td>0.189</td>
<td>-0.26</td>
<td>0.102</td>
</tr>
<tr>
<td>ANA</td>
<td>0.05</td>
<td>0.741</td>
<td>-0.03</td>
<td>0.857</td>
</tr>
</tbody>
</table>

* (P: 0.01-0.05), ** (P: less than 0.01), NS (P: More than 0.05).

![Image of ROC curve for IL18](image)

**Figure (2): The Roc curve for IL18**

Area under the ROC curve (AUC) for the analysis includes IL18 is (0.904). The best cut-off point derived from the ROC curve shows a sensitivity of (82.5%) and specificity of (95.0%) is ≤ 1.943(ng/ml). A test value below 1.943(ng/ml) is referring to the abnormal case (disease case) and the value above 1.943(ng/ml) is representing the healthy case. As shown in figure (2), a high significance difference is (P<0.0001).
sVCAM test is considered a good marker to diagnose SLE because the area under the ROC curve (AUC) for the analysis is 0.754. The best cut-off point derived from the ROC curve shows a sensitivity of 66.2% and specificity of 77.5% is ≤ 2.232 (ng/ml). A test value below 2.232 (ng/ml) is referring to the abnormal case (disease case) and the value above 2.232 (ng/ml) is representing the healthy case. As shown in figure (3), a high significance difference is (P<0.0001).

Figure (3): The ROC curve for sVCAM

Discussion

VCAM is associated with inflammatory cell sequestration through interactions with leucocyte integrated integrin. Soluble VCAM-1 levels are raised in several autoimmune diseases, including rheumatoid arthritis and SLE (12).

Earlier studies showed the serum concentration Svcam-1 control the development of SLE disease (13). Conforming to these previous studies, it was found that absolute SVCAM-1 levels were less useful than other traditional markers such as ds DNA anti body titers C3 and C4 levels as a diagnostic tool for the identification of SLE patients due to the inherent variation of sVCAM-1 levels between individuals (14).

In past years, it was reported that sVCAM-1 level may be associated with endothelial activation. In general sVCAM and sICAM serum concentration in coronary artery disease and endothelial dysfunction-related disease are only modestly evaluated. This complies with evidence that sICAM-1 levels are nearer to systematic endothelial dysfunction than sVCAM-1 levels. sVCAM-1 level is related with those observed in patients with necrotic shock (15).

Patients with elevated SLE disease activity are among the most significant. Our observation that sVCAM-1 level are much stronger than sICAM-1, sP-selectin, sE-selectin, shows variances in the level sVCAM-1 reflect other physiological roles than endothelial activation. Furthermore, Vcam-1 has a major role at several essential steps of lymphocyte production due to its pervasive expression in minor lymphoid tissues (16).

VCAM-1 is largely expressed in bone marrow stream cells and is required for both early pre-pro B-cell production and long-lived bone marrow plasma cell retention. B-cell maturation in the mouse is caused by conditional of VCAM-1, which lead to increased circulating immature B-cell, suggesting that VCAM-1 is an important factor for homing mature B bone marrow cells (17).

It is not clear if sVCAM-1 is eliminated in the course of any the cell interactions between lymphocytes.
and DC or other stromal cells that have VCAM-1. The super family IL-1 is made up of 11 members; some are known to be pro-inflammatory, including IL-1α, IL-1β and IL-18, the most studied IL-1 superfamily members in autoimmune disease, all of whom have been involved in SLE pathogenesis.\(^{18}\)

In this research, we demonstrated that serum IL18 levels are considerably higher in patients with SLE. These results confirm previous studies that there are significantly higher IL18 levels in SLE patients than healthy control\(^{19}\).

The association of IL18 with an overall active disease (ODA) is reported in previous studies, like kidney disease and organ damage, related to other variables and also in patients with biopsy-proven LN. The association of IL-18 with active renal disease was confirmed. Similarly, in LN patients, an earlier study has shown elevated serum IL-18 levels.\(^{20}\) In other studies in both glomeruli and LN cases, it was found an increase in IL-18. IL-18 has also been proposed as a suitable marker for long term outcomes in pediatric LN. Kidney dysfunction is a significant indicaor of SLE harm development; previous results in smaller study documenting revealed the elevated IL-18 level in patients with organ damage.\(^{21}\)

Acknowledgments: We would like to thank the staff of the Baghdad Teaching Hospital in the Medical City, and department of chemistry in College of Science for Women, University of Baghdad for their efforts and supports that helped to conduct this study.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

Funding: Self-funding

References


The Effect of Vitamin D3, Vitamin B6, Selenium and Some Electrolytes on the Women with Nausea and Vomiting of Pregnancy in Thi-Qar Government-Iraq

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Abstract

Objective: Nausea and vomiting (NVP) are among the most common symptoms during pregnancy. NVP causes emotional and psychological distress and can have a profound impact on a woman’s quality of life (QoL).

Material and Method: Vitamin D3 and Vitamin B6, Se and electrolytes (Mg⁺², K⁺) levels were determined in first and second trimesters in 120 women suffering from nausea and vomiting of pregnancy, 30 pregnant women free of symptoms, age identical between the ages of (17-45) years.

Results: Vitamin D3, Vitamin B6, K⁺, Se and Mg⁺² in the blood showed a significant decrease in all patients as compared to control group (P ≤ 0.05).

Conclusion: In patients with NVP and NP we find a significant reduction in level of Vit.D3, and decrease in level of serum Vit. B6, K⁺, Se and Mg⁺². In first trimester found a decrease in levels of Vit.D3, Vit.B6 and K⁺ more from second trimester, while in first trimester found an increase in levels Se, Mg⁺² more from second trimester.

Keywords: Pregnancy, Nausea and vomiting (NVP), First and Second trimesters, Vitamin D3, Vitamin B6, Selenium, Potassium, Magnesium.
been proposed as a cause for NVP too\(^9\). Vitamin B6 supplementation may be important for achieving adequate intake during pregnancy\(^{10}\). Selenium plays an important role in the maintenance of human health\(^{11}\). It is a vital intracellular antioxidant that prevents oxidative cellular damage\(^{12}\). The demand for selenium during pregnancy is increased to support optimal fetal growth, resulting in decreased maternal blood and tissue concentrations of selenium\(^{13}\). Electrolytes are present in the human body, and the balance of the electrolytes in bodies is essential for the normal function of the cells and organs\(^{14}\). Magnesium (Mg\(^{2+}\)) is the fourth most abundant cation in the body and the second most abundant intracellular ion\(^{15}\). Pregnancy represents a physiological situation with increased magnesium requirement\(^{16}\). An adequate magnesium intake also seems to be important for further healthy development in pregnancy\(^{17}\). Potassium (K\(^+\)) is a very important mineral to the human body for Building proteins, Break down and use carbohydrates, Building muscle, maintain normal body growth, control the electrical activity of the heart and control the acid-base balance\(^{15}\).

**Material and Method**

This study conducted at the Bent Al-Huda hospital in Thi-Qar Governorate/Iraq, biochemistry laboratory, the hormones and immunology laboratory, the specialized clinics. It included (150) subjects, the control group consisting of (30) women Symptom -free (SF) and patients (120) . About (5mL) of blood samples of NVP patients and controls. Analyzed Vitamin D3, Vitamin B6, electrolet and Se. Vitamin D3 in serum was analyzed by ELISA instrument, kits supplied by Calbiotech, USA . Serum vitamin B6 was analyzed by (ELISA) instrument, kits supplied by Elabscience, USA . Serum Mg\(^{2+}\) and K\(^+\) was analyzed by enzymatic colorimetric method by UV/VIS spectrophotometer, kits supplied by (S.A.E), Egypt. Concentrations of selenium element in serum samples were measured by flame atomic absorption device, at the college of sciences/university of Thi-Qar. **Excluded cases**: non-pregnant women, smokers, pregnant women with diabetes, preeclampsia, heart disease, patients with chronic diseases. **Statistical Analysis**: All statistical analysis was performed using SPSS, Windows version 24.0 software and Microsoft Excel 2010. the results were expressed as mean ± standard deviations (mean ± SD),and Least Significant Difference (LSD). One way analysis of variance (ANOVA) was used to compare parameters in different studied groups. P-values (P ≤ 0.05) were considered statistically significant.

**Results**

In this study, we identified the effect of NVP and NV on pregnancy womans in first and second trimesters in Vitamins (D3 and B6), Electrolytes (Mg\(^{2+}\) and K\(^+\)) and trace elements (Se). The levels of biochemical markers in pregnancy (Vit.D3,Vit B6,Se, Mg\(^{2+}\),K\(^+\)) showed a significant decrease in NVP and NP patients compared to the control group. We also identified the effect of pregnancy period (first trimester) (1st),(second trimester) (2nd) on those parameters biochemical, and the results indicate a significant decrease in the concentration of vitamin D3 (Vit.D3) in (1st) compared to (2nd) compared to the control groups .As shown a significant decrease in the concentration of (Vit.B6 and K\(^+\)) in (1st) compared to (2nd). The results showed a significant increase in the levels of (Se and Mg\(^{2+}\)) in (1st) compared to (2nd). We also identified the correlation between (V.D3) and with those parameters biochemical and the results showed positive correlation.

**Table (1): Serum vitamin D3 and vitamin B6 Test for patients with NVP,NP and the controls.**

<table>
<thead>
<tr>
<th>Groups</th>
<th>No.</th>
<th>Vit.D3 (ng/ml) Mean ± SD</th>
<th>Vit.B6 (ng/ml) Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVP</td>
<td>1st</td>
<td>30</td>
<td>2.02±0.15(^a)</td>
</tr>
<tr>
<td>NVP</td>
<td>2nd</td>
<td>30</td>
<td>2.52±0.21(^d)</td>
</tr>
<tr>
<td>NP</td>
<td>1st</td>
<td>30</td>
<td>3.20±0.43(^c)</td>
</tr>
<tr>
<td>NP</td>
<td>2nd</td>
<td>30</td>
<td>3.60±0.30(^b)</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>30</td>
<td>8.52±1.12(^a)</td>
</tr>
<tr>
<td>LSD</td>
<td></td>
<td>0.14</td>
<td></td>
</tr>
</tbody>
</table>
Table (2): Serum Se, Mg⁺² and K⁺ Tests for patients with NVP, NP and the controls.

<table>
<thead>
<tr>
<th>Group</th>
<th>No</th>
<th>Se (mg/l) Mean ±SD</th>
<th>Mg⁺² (mg/dl) Mean ±SD</th>
<th>K⁺ (mmol/L) Mean ±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVP 1st</td>
<td>30</td>
<td>7.13±0.43ᵇ</td>
<td>2.22±0.11ᵇ</td>
<td>3.44±0.81ᶜ</td>
</tr>
<tr>
<td>NVP 2nd</td>
<td>30</td>
<td>3.86±0.37ᵉ</td>
<td>2.11±0.61ᵇ</td>
<td>4.08±0.57ᵇ</td>
</tr>
<tr>
<td>NP 1st</td>
<td>30</td>
<td>6.68±0.63ᶜ</td>
<td>2.24±0.04ᵇ</td>
<td>4.24±0.62ᵇ</td>
</tr>
<tr>
<td>NP 2nd</td>
<td>30</td>
<td>5.37±0.54ᵈ</td>
<td>2.13±0.46ᵇ</td>
<td>4.26±0.49ᵇ</td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>7.60±0.52ᵃ</td>
<td>2.40±0.12ᵃ</td>
<td>5.25±1.02ᵃ</td>
</tr>
<tr>
<td>LSD</td>
<td></td>
<td>0.22</td>
<td>0.15</td>
<td>0.31</td>
</tr>
</tbody>
</table>

* Each value represents mean ± SD values with non-identical superscript (a, b, or c…etc.), which were considered significant differences (P≤ 0.05).


Discussion

Our study is the first to include a clinical study of vitamins and elements and their effect and classification of nausea and vomiting during pregnancy during the first and second trimesters of pregnant women with NP and NVP and asymptomatic pregnant women. Morning sickness is a frequent symptom in pregnancy, the pregnant woman has nausea or vomiting at various levels due to gestational hormone increase (HCG), leading to dehydration, weight loss, malnutrition, and micro-nutrient deficiency as well. Vitamin D is a well-known immunomodulatory and anti-inflammatory agent in the body(18). Pregnant women with morning sickness had a double increase in vitamin D deficiency risk versus pregnant women without morning sickness at P<0.05(19). Table (1), show a significant decrease in the concentration of serum Vit.D3 in all patient with NVP, NP in comparison with control groups. There was no significant difference in the prevalence of 25(OH) D deficiency(25(OH)D,50nmol/l)among pregnant women in the three different trimesters(20) nutrients from vitamins and supplements in addition to foods, however, revealed that the intake of many micronutrients increased substantially from the 1st to 2nd trimester(21). Vitamin D deficiency is a widespread global problem, which even can observe in the countries which get enough sunlight(22). Table (1), show a significant decrease in the concentration of serum Se in all patient with NVP, NP in comparison with control groups. In a previous study, the antioxidant activity was significantly lower in Women with NVP compared to healthy pregnant women. Some theories may explain the decreased levels of antioxidants in NVP in the study. The decreased dietary intake of most nutrients rich in antioxidants is observed in women with NVP(26). Selenium is believed to be one of the most important antioxidant nutrients in the human body, and selenoproteins have a protective effect against oxidative stress and inflammation(27). Various studies have demonstrated that during pregnancy, the whole blood and plasma selenium concentrations, and the activity of glutathione peroxidase in red cells and plasma decline in a linear fashion from the first trimester to parturition(28). The demand for selenium during pregnancy is increased to support optimal fetal growth, resulting in decreased maternal blood and tissue concentrations of selenium(13). Table (2), show a significant decrease in the concentration of serum Mg⁺² in all patient with NVP, NP in comparison with control groups. In a previous study serum Mg⁺² concentration during pregnancy was significantly lowered to a value
considered to be deficiency starting appears at the first trimester and continues to decline during the rest of pregnancy have a significant negative correlation with pregnancy duration\(^{(29)}\). The reduction of serum Mg\(^{2+}\) level during pregnancy is mainly attributed to fetal growth demand or because of nutritional status during pregnancy. Many explanations behind this reduction, it is most likely due to the fetus and placenta absorb huge amounts of nutrients particularly magnesium from the mother\(^{(30)}\). Early signs of deficiency can include loss of appetite, nausea, vomiting, fatigue, and weakness\(^{(31)}\).

Table (2), show a significant decrease in the concentration of serum K\(^+\) in all patient with NVP, NP in comparison with control groups. The concentration of (K\(^+\)) in the serum is a balance among intake, excretion, and distribution between the extra-and intracellular spaces\(^{(32)}\). A patient with Hyperemesis gravidarum (HG) frequently vomits gastric juice and, thus, the loss of hydrogen ions, sodium, chloride, and water in gastric contents leads to chloride-sensitive metabolic alkalosis, dehydration, and extracellular fluid (ECF) volume reduction\(^{(33)}\) causing elevated activity of the renin-angiotensin-aldosterone system (RAAS)\(^{(33)}\). This activated RAAS, in turn, increases the urinary excretion of potassium, compounding the hypokalaemia\(^{(34)}\).

**Conclusion**

Vitamin D is has a key role in the etiopathogenesis of nausea and vomiting pregnancy because vitamin D deficiency might lead to problems in immune regulation.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** None

**Funding:** Self-funding

**Reference**

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Study the Sensitivity and Specificity of Urinary Arginase in Bladder Cancer Patients in Babylon Governorate

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²Prof., College of Medicine, University of Babylon, Iraq

Abstract

Background: Urinary Arginase is an enzyme found in the urine that can be measured by ELISA. The sensitivity and specificity of this test can also be checked.

Aim: The present study aims to determine Arginase in urine in the bladder cancer patient’s the type of this study is case- controls study.

Method: The study was conducted during the period from August 2019 until February 2020. There are two groups, the first containing forty-five patients and the second forty-five control.

Results: The level of arginase in the urine of CA Bladder patients was evaluated in the two groups, the first group, G1 newly diagnosis (94.6±17.2), and second group G2 treatment and follow-up (.91.2±13.6),compared with normal patients control group (77.9±12.9).In this study, urinary arginase was significantly higher in both groups of Bladder cancer patients G1 and G2 compared to normal control group of patients (CG) P value < 0.001. In G1 (new diagnosis) urinary arginase was negligible in contrast with G2 (Treatment and follow up) P-value > 0.05. Throughout this analysis, the amount of urinary arginase increases with an increase in the cancer stage, thereby increasing cell degradation and releasing more protein molecules in the urine, such as arginase.

In Conclusion: This enzyme may serve as a useful biological urinary marker in bladder cancer while also being an indication of the progression of bladder cancer. the sensitivity of this test (92.59) and the Specificity (51.52)The sensitivity and specificity of this test should be improved in order to be used in the follow-up of patients with bladder cancer.

Keywords: Urinary Arginase, Bladder cancer, Specificity, Sensitivity.

Introduction

Bladder Cancer is the fourth most common cancer in males and the eighth in females and is the most common neoplasm of the urinary system[1]. Bladder cancer is a well-known condition that affects men more than women[2]. The definition of urothelial carcinoma is the invasion of the basement membrane or lamina propria or deeper by neoplastic cells of urothelial origin It includes one of many types of malignant growth of the urinary bladder and It characterized by abnormal cells multiply without control in the bladder[3]. Cigarette smoking is the most well-established risk factor for Bladder cancer[4]. Bladder cancer (BC) is ones of the most common cancer worldwide. It is classified in muscle invasive (MIBC) and muscle non-invasive (NMIBC) BC[5]. NMIBCs frequently recur and progress to MIBCs with a reduced survival rate and frequent distant metastasis [6]. BC detection require unpleasant and expensive cystoscopy
and biopsy, which are often accompanied by several adverse effects. Thus, there is an urgent need to develop novel diagnostic method for initial detection and surveillance in both MIBCs and NMIBCs[7]. Multiple urine-based tests approved by FDA for BC detection and surveillance are commercially available. However, at present, sensitivity, specificity and diagnostic accuracy of these urine-based assays are still suboptimal and, in the attempt to improve them, novel molecular markers as well as multiple-assays must to be translated in clinic [8].

Arginase is a ubiquitous enzyme. It is present in yeasts, bacteria, plants, Invertebrates, and Vertebrates. It acts on the final step that leads to the production of urea (urea cycle)[9]. Arginine hydrolysis to form Ornithine and urea by the action of Arginase. Ornithine will convert to proline by ornithine aminotransferase (OAT) and polyamines by the ornithine decarboxylase (ODC) pathway [10]. Arginase is a manganese metalloenzyme that hydrolyses L-arginine to urea and L-ornithine. Arginase exists in two distinct isoforms, arginase I and II, that share 60% sequence homology[11]. Although both isoforms are found throughout the body, arginase I is a cytosolic enzyme mainly localized in the liver[12]. Hepatic arginase I contributes most of the body’s total arginase activity and has a pivotal role in eliminating nitrogen formed during amino acid and nucleotide metabolism via the urea cycle [13]. More recently, arginase I expression has been demonstrated in extra-hepatic tissues including endothelial cells and vascular smooth muscle cells[14]. Arginase II is a mitochondrial enzyme with a wide distribution and is expressed in the kidney, prostate, gastrointestinal tract, and the vasculature. The role of arginase II is not completely understood, but the enzyme is assumed to be involved in the regulation of L-arginine homeostasis and production of L-ornithine for polyamine and proline synthesis for cell proliferation and development[15]. Both isoforms are expressed in the vasculature, but it appears as if the expression is both vessel and species dependent[16]. Increased arginase activity in mammals has been associated with cardiovascular and nervous system dysfunction and disease[17]. Arginase can be expressed in many various types of cells and can be stimulated by a vast variety of agents and conditions, depending on tissue and species[18].

Materials and Method

The type of this study is case- controls study, which is done in the laboratory of Biochemistry Department, College of Medicine, University of Babylon. The study was conducted during the period from August 2019 until February 2020. The entire samples collected from patients attending Al-Hila Teaching Hospital, Urology Department at Margean Hospital Department of Oncology. The patient’s group who subjected to this study were 45 patients divided into two groups depend on pathological staging: Group One (G1). Patients with this group newly diagnosis of CA bladder. This group including 19 patients in the range of age 35-76 years it is have 14 males (mean ± standard deviation 59.7 ± 10.7 years) and 5 females (mean ± standard deviation 61.0 ± 14.4 years). Group Tow (G2) This group include patients with treatment of CA bladder and Follow up after treatments. This group including 26 patients in the range of age 52-86 years it is have 20 males (mean ± standard deviation 65.4 ± 7.7 years) and 6 females (mean ± standard deviation 65.4 ± 12.1 years). Anther grouped this includes forty- five apparently healthy subjects with an age range 31-67 years there are 11 females and 34 males. None of these subjects had a history of abnormal liver function, blood dyscrasias, hematuria and with any Lwoer part of urinary infection. Ten to twenty milliliters of urine were collected from patients and healthy persons to the urine cup and then collected in the plane tube were centrifuged at 4000xg for approximately 15 minutes. The supernatant was divided in two parts of 1.ml and transferred to the Eppendrof tube and stocked at -20 C until time of use. This Arginase enzyme-linked immunosorbent assay applies a technique called a quantitative sandwich immunoassay. The microtiter plate provided in this kit has been pre-coated with monoclonal antibody specific for Arg. Standards or samples are then added to the microtiter plate wells and Arg if present, will bind to the antibody precoated wells. In order to quantitatively determine the amount of Arg present in the sample, a standardized preparation of horseradish peroxidase (HRP)-conjugated polyclonal antibody, specific for Arg are added to each well to sandwich the Arg immobilized on the plate. The microtiter plate undergoes incubation, and then the wells are thoroughly washed to remove all unbound components. Next, A and B substrate solution is added to each well. The enzyme (HRP) and substrate are allowed to react over a short incubation period. Only those wells that contain Arg and enzyme-conjugated antibody will exhibit a change in color. The enzyme-substrate reaction is terminated by the addition of a sulphuric acid solution and the color change is measured spectrophotometrically at a wavelength of 450 nm[19].
Results and Discussion

The mean ±SD age of Bladder cancer patients were (60.6±10 years). age distributions of CA Bladder patients were as follow:

According to this figure, the age distributions of CA Bladder patients in this study show a peak level in the age of 55-64 years and the least between 35-44 years age groups. The mean age of Bladder cancer in this study was 62 years, and it is near the mean age reported in a previous study done in Iraq which is 60 years [20-24].

Table (1): Means Age ±SD of Bladder Cancer Patients Compared to Control.

<table>
<thead>
<tr>
<th>Subject</th>
<th>No.</th>
<th>Mean±SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newly diagnosis</td>
<td>19</td>
<td>59.28 ± 11.26</td>
<td>35-76</td>
</tr>
<tr>
<td>Treatment and follow up</td>
<td>26</td>
<td>64.55 ± 6.92</td>
<td>52-84</td>
</tr>
<tr>
<td>Control</td>
<td>45</td>
<td>46.15 ± 6.39</td>
<td>31-67</td>
</tr>
<tr>
<td>P.value</td>
<td></td>
<td>Newly diagnosis versus Treatment and follow up (P&gt;0.05)</td>
<td></td>
</tr>
</tbody>
</table>

The number of male’s patients in this study was 34 in the ages ranging between 35-80 with mean ± SD (59.7±10.7) while the female’s number was 11 in the ages ranging between 48-84 with mean ± SD (63.1±10.0). The ratio of males to females in CA Bladder patients in this study represented to 4:1 proportion. The demographic distribution of male and female in this study, the male’s patients have the greatest ratio than females, these ratios agrees with other studies done in Iraq which concluded to a similar ratio between male and female with CA bladder in his study. According to the history of Bladder cancer patients participated in this study all 30 male patient and 5 female patients was a heavy smoker for a long time. In the present study, the level of arginase in the urine of CA Bladder patients was evaluated in the two groups, the first group, G1 newly diagnosis
(94.6±17.2), and second group G2 treatment and follow-up (.91.2±13.6), compared with normal patients control group (77.9±12.9). In this study, urinary arginase was significantly higher in both groups of Bladder cancer patients G1 and G2 compared to normal control group of patients (CG) P value < 0.001. In G1 (New Diagnosis) urinary arginase was negligible in contrast with G2 (Treatment and follow up) P-value > 0.05.

Table (2): The Mean ±SD of Urinary Arginase (Arg) in CA Bladder Compared to Control

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Subjects</th>
<th>No.</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary arginase</td>
<td>Newly diagnosed</td>
<td>19</td>
<td>94.6±17.2</td>
</tr>
<tr>
<td></td>
<td>Treat. &amp; fallow up.</td>
<td>26</td>
<td>91.2±13.6</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>45</td>
<td>77.9±12.9</td>
</tr>
<tr>
<td>P-value</td>
<td>Newly diagnosed versus Control group (P &lt;0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Treat. &amp; fallow up. versus Control group (P &lt; 0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Newly diagnosed versus Treat. &amp; fallow up (P &gt; 0.05)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Throughout this analysis, the amount of urinary arginase increases with an increase in the cancer stage, thereby increasing cell degradation and releasing more protein molecules in the urine, such as arginase. Hence, this enzyme may serve as a useful biological urinary marker in bladder cancer while also being an indication of the progression of bladder cancer. These findings of the previous research support report have showed that the amount of arginase in the different types of cancer increases as the tumor stage increases.

Figure(2): Arg in CA bladder and control groups

To extract sensitivity and specificity, Medcalc was used. Medcalc is a simple statistical program with full capabilities, as it contains all the functions and statistical tests, in addition to the lightness of the program and simple graphical interfaces from us, and also features great graphics[27]. This program was used to obtain the sensitivity and Specificity of Urinary Arginase that is managed through test schedules the results are as follows:

Table (3): Sensitivity and specificity of Urinary Arginase

<table>
<thead>
<tr>
<th>Abbreviations</th>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sens.</td>
<td>Sensitivity</td>
<td>92.59</td>
</tr>
<tr>
<td>Spec.</td>
<td>Specificity</td>
<td>51.52</td>
</tr>
<tr>
<td>AUC</td>
<td>Area under the ROC curve</td>
<td>0.716</td>
</tr>
<tr>
<td>P.Value</td>
<td>Probability value</td>
<td>0.001</td>
</tr>
</tbody>
</table>
Conclusions

CA bladder patients in Babylon province have high urinary arginase level comparing to normal subjects. Urinary arginase can be used as CA bladder protocol during the course of follow up for CA bladder patient and may help to minimize the need for an invasive procedure or radiation imaging. Therefore, please work on improving the sensitivity and specificity to test for Urinary Arginase so that it can be used as a protocol in the follow-up of bladder cancer patients.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: None

Funding: Self-funding

References


bladder cancer are frequent and associate with reduced recurrence in non-muscle invasive tumors. Molecular carcinogenesis. 2015 Jul;54(7):566-76.


Aspects of Fatal Burn Injury Cases Admitted to Al–Sadiq Teaching Hospital, Babylon Province/Iraq During 2020

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Abstract

**Background:** Burns death both intentional and non-intentional considered among the most disastrous outcome of burn injuries.

**Objectives:** To measure the case fatality rate in hospitalized burn patients and to investigate in-hospital mortality among burn injury cases who were admitted to Al–Sadiq Teaching Hospitalburn center from the first of January to the end of June, 2020.

**Methodology:** This is an observational descriptive case series study conducted on all cases who died from burn injury among patients who were admitted to the biggest teaching hospital in Babylon Province – Iraq. Data were collected from patients themselves or their companions and from patients’ hospital records, using a pretested questionnaire designed for collection the requested information.

**Results:** The mean age ± SD (Standard Deviation) of burn death victims were 24.5±17.66 years. Young age group (15-24 years) represents the highest proportion (50%). Male to female ratio was 1:2.25. The case fatality rate was 26.6%(32/120). The majority of cases were from rural areas, 67% of suicidal burn deaths had more than 50% of burnt total body surface area. Intentional burn deaths victims had significantly severe burns (third degree burn and high-burnt surface area) as compared to accidental burn deaths. There was a statistically significant difference as regards the mode of burns between the intentional and accidental burn deaths, all intentional deaths were burnt with flame.

**Conclusions:** The case fatality rate of burn injuries was high, females outnumbered males, and suicidal burn deaths were significantly associated with severe burn as compared to the accidental ones.

**Keywords:** Intentional burn injury deaths, accidental burn deaths, Babylon, Iraq.

Introduction

According to World health Organization, fire burns were responsible for more than 300,000 deaths annually\(^(1)\). Burns still represent one of the leading cause of death in developing countries\(^(2)\).

Recently, developed countries have made good progress in lowering burn-related mortality including Self Inflicted Burn (SIB) by raising awareness, prevention, improving secondary and tertiary health care and support programs for SIB cases\(^(3)\) but SIB is still a priority public health problem in developing countries, including Iraq\(^(4)\).

Self-burn is high in Asian countries and the lowest in the United States\(^(5,6)\). This may be associated with the instability of the region, due to insecurity and the continuous arm conflicts. The rates of SIB associated burn deaths were very high 85% in Pakistan\(^(7)\), 79.6% in Iran\(^(8)\), and high 60% in Nepal\(^(9)\) while the rates of

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deaths are low in Brazil 40%\(^{(10)}\) and Sri Lanka 27%\(^{(11)}\). SIB is generally more common among females than among males\(^{(12)}\).

The majority of burn death cases were accidental, while suicidal manner was mainly observed in females\(^{(13-21)}\).

The burden of burn in Baghdad is quite high\(^{(22)}\). The objectives of this study are to measure the case fatality rate in hospitalized burn patients and to investigate in-hospital mortality among burn injury cases.

**Methodology**

This is an observational descriptive case series study conducted on all cases who died from burn injury among patients who were admitted to Al Sadiq Teaching Hospital–Babylon Province–Iraq, this hospital is biggest general teaching hospital in Babylon province, the burn unit includes two wards for males and females. This hospital serves the population of Babylon province, which located in the south central region of Iraq and populated about two million inhabitants. The period of study started from the first of January 2020 to the end of June 2020. Data were collected from patients themselves or their companions and from patients’ hospital records, using a pretested questionnaire designed for data collection. Acceptance from the University of Babylon Ethical Committee, College of Medicine and the director of Babylon Health Directorate were taken. Informed verbal consents were obtained from the patients’ companions or their families, the confidentiality was ensured by keeping all records anonymous. Data include socio-demographic data (age, gender, level of education) types of burn and etiology of burn.

Burns can be; partial thickness burns (second degree) extend through the epidermis and into the dermis or full-thickness burns (third degree) extend through the subcutaneous fat or deeper\(^{(23,24)}\). When estimating the degree of burn in this study, only partial thickness and full thickness burns are considered, and superficial burns are excluded. The extent of burn injury determined by the total body surface area (TBSA) in which estimated according to the rule of nine \(^{(25)}\).

**Results**

A (32) dead cases included in this study out of 120 burn injured patients. The case fatality rate was (26.6%). Burn mortality higher in females than in males, OR with 95% CI (2.78; 1.16-6.72) \(P 0.019\). Death doubled in those aged >18 years old than in children aged ≤ 18 years, OR with 95% CI (3.03; 1.30-7.06) \(P 0.009\). Half of patients with 3rd degree burn injuries and mixed burn were dead, while 97% of those with 2nd. degree were cured, OR with 95% CI (30.5 6.81-136.6) \(P 0.0001\), table [1].

**Table 1: Association between demographic characteristics and burn degree with the outcome of burn injuries (N=120).**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Outcome (N=120)</th>
<th>OR (95% CI)</th>
<th>Sig.*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cured (n=88)</td>
<td>Dead (n=32)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>46 (84%)</td>
<td>9 (16%)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>42 (65%)</td>
<td>23 (35%)</td>
</tr>
<tr>
<td>Age groups (years)</td>
<td>≤ 18</td>
<td>54 (83%)</td>
<td>11 (17%)</td>
</tr>
<tr>
<td></td>
<td>&gt; 18</td>
<td>34 (62%)</td>
<td>21 (38%)</td>
</tr>
<tr>
<td>Burn degree</td>
<td>2nd</td>
<td>59 (97%)</td>
<td>2 (3%)</td>
</tr>
<tr>
<td></td>
<td>3rd and mixed</td>
<td>29 (49%)</td>
<td>30 (51%)</td>
</tr>
</tbody>
</table>

* Chi-Square Test

The mean age ± SD (standard deviation) of burn death victims are 24.5±17.66 years, ranged (1.5 – 83 years). Young age group (15-24 years) represents 50% of burning deaths, as shown in figure [1]. Male to female ratio 1:2.25 (P 0.013), figure [2].
Concerning the marital status, 59% of them and 15.6% are single. The majority (87%) of victims have intermediate school achievement or less, and 62% of them have not enough monthly income. Only three (9%) of victims present with past medical history, and one case (3%) present with history of mental illness. Five cases (16%) reported tobacco smoking, table [2].

The mean duration of admission to hospital was four days±2.79 SD. Findings indicated that 25%, 44% and 31% of victims hospitalized for 1 day, 2-5 days and >5 days respectively.

One-half of deaths occurred intentionally by suicide. Suicidal burn deaths patients have severe burns (3rd. and mixed degree of burn i.e. third and second degree) while most of accidental burn deaths have less severe (mixed degree patients), two of them occurred in patients with 2nd degree (P 0.051), figure [3].

Table 2: Description of socio-economic characteristics, past medical/mental illness history and risky behavior of the burning death (N=32).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital status</td>
<td>Child &lt;15 yrs.</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Divorced</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Widowed</td>
<td>1</td>
</tr>
</tbody>
</table>
The mean total body surface area was 59.72 ± 23.8 SD ranged (24-100%). More than two-third of patients present with TBSA ≥ 50%. However, suicidal death present with 67.8% mean TBSA while, accidental death present with 51.5% mean TBSA (P 0.05). The causes of burn was flame in 81% of death and 19 by hot liquids, table [2]. All intentional burn deaths occurred by using flame while, two-third of accidental death occurred with flame and one-third by hot liquids (P 0.018).

### Table 3: Frequency distribution of total body surface area of burn and the etiology of burn (N=32)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>TBSA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10-20%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>21-30%</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>31-40%</td>
<td>6</td>
<td>19</td>
</tr>
</tbody>
</table>
Findings indicated that 63% of patients were uninvestigated for microbial infections, Pseudomonas detected in 16% of patients, negative microorganisms detected in 9% of the sample and Staphylococcus aurous detected in 6% of them.

### Discussion

The current study is undertaken to describe the characteristics of hospitalized burn deaths. The case fatality rate in this study is relatively high as compared to the results reported by other national studies conducted in Diqar, Basrah, Musol, Baghdad and Babylon governorates. The fatality rate in this study is higher than rate reported by Kandeel FS and El Mehrat et al in Menoufia University Hospital, Egypt and that reported in Jordan. But it was very much higher than that reported by Krishnan et al. from the United Kingdom who noted mortality rate 1.9%. These differences may be due to the nature of these societies as they have better health care services with higher level of public awareness, this comparison should bring the attention of health care planner in Babylon governorate to develop much better health care facilities.

Females are outnumbered among self-inflict burn victims in this study at their young age, this finding goes in line with the findings of other studies. In a qualitative study carried out by Gatea et al in Baghdad on thirty SIB women in their reproductive age they found that females who committed suicide using burn specially fire have four problems leading to this burn deaths these included; personal, social, economic and family situation of the victims. Among these, the main identified factors, family pressure, unstable families, and poor mental health. Females at home may find a fire as weapon to end their lives by burn instead of suffering in male dominated poor societies. In our study most of the victims had low level of education while Gupta et al. showed that the majority of victims had primary school level.

Most of the victims belong to low socioeconomic class this finding consistent with the finding of Vaghela et al. who reported that most of cases were in low socio economic status. The majority of victims in this study had more than 50% burnt total body surface area. The risk of death usually increased burnt surface areas as this indicates the incompatibility with life.

Suicidal burn deaths patients have severe burns (3rd, and mixed degree of burns) while most of accidental burn deaths have less severe degree of burns and the majority of cases were mainly from rural areas. These findings are consistent with the finding of other studies.

Suicidal manner was observed in half of the victims this percentage is much higher than that reported by similar study conducted in Egypt which revealed that the majority of cases were accidental burn deaths but, our finding agrees with the finding of Nath et al. in India, which revealed that the majority of deaths were suicidal in nature followed by homicidal and the least were accidental. These differences may be due to different religions, believes and cultures. The Islamic law considers suicide to be a crime act onto the self. Thus, the number of SIB may be not reported for fear of legal responsibility and social and religion rejections of this act.

This high rate of suicidal deaths mainly among women may show the tip of iceberg (underestimated) due to the above mentioned reasons and the social stigma, this denotes a real presence of high priority health and social problem of suicidal burn deaths.

### Conclusions

The case fatality rate of burn injuries was high, females outnumbered males, and suicidal burn deaths were significantly associated with high severity as compared to the accidental.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** None

**Funding:** Self-funding
References


The Effect of Sports Forums within Population Centers on Physical Abilities and Results of School Table Tennis for Students

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Abstract

The study aimed to prepare a questionnaire for a survey of forum goers and table tennis practitioners and to identify the differences between them in terms of their physical abilities, skill performance, and results of table tennis, and the researcher used the descriptive approach in a comparative study of the reasons and the method of pre and post measurement for two groups equal to its suitability with the nature of this study, and chose a sample (415) students from the community of middle school in the holy Karbala, who are enrolled in the first semester of the academic year (2018-2019) and in an intentional way I choose (33) students from table tennis players participating in the school championship organized by the sports and scouting activity in the governorate.

They were divided into two groups, the first group included (16) students from the regions inhabited by youth forums, and the second group included (17) students from the residents of the areas where these forums did not exist, and the researcher conducted special physical tests within the main experiment of the research, then the two groups left a period (8) Weeks later, the researcher conducted the post-test and the results showed the effectiveness of the presence of forums in the housing areas and their effect on improving elements Special fitness for volleyball, as well as the training contribution in the forums showed the improvement of the skill performance of the first group by winning the school championship. It improves their physical fitness.

Keywords: Sports forums, population and physical abilities.

Introduction

Fitness is one of the most important objectives of education sports and basic components of the health of the individual to relate positively to many life areas such as growth, health, physical, mental, psychological, social, educational attainment, and other words of life that makes a person active in his community. Its importance not to the general public but also contribute effectively to the appropriate setting to perform the duties required of the individual, and because physical exercises are subject to educational and scientific foundations, they have become an area of concern for teachers and trainers at the same time, and physical fitness is divided according to its purpose into public and private physical fitness.

The physical fitness elements of the table tennis game are among the elements that must be available in the successful table football player who possesses a physical structure characterized by the speed, agility, and the superior strength of the distinctive strength, the superior strength. The kinematic dynamics of the game of ball game depends largely on the development of the elements of speed and power in addition to determining the amount of friction required between the ball and the racket that

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has become necessary to reach the results.\textsuperscript{1} Fast action for a short period of time that the player uses either for the purpose of quickly ending the point, or to deal with his control of the game and the style of opponent play, and so the table tennis player needs a special physical abilities that do not depend on the abilities of the support that does not support Sports belonging to the Ministry of Youth have a role in enhancing physical abilities as a result of continuous play in them and the presence of these forums near student housing, which enhances the physical abilities of the players of table tennis, so this came The study is to show the effect of playing in nearby forums on developing physical capabilities and athletic achievement if these young people have the opportunity to represent their schools in these school competitions.\textsuperscript{2}

Important and fundamental factors in the process of learning the different sports skills, are daily her constant practice, the more you practice daily workouts is getting a sense of movement or skill and can be performed better, which leads to increase performance significantly as well as upgarding the physical abilities required for the performance, and to repeat the exercise A great role in the learning of motor skills the more the student possesses a high degree of physical capabilities and technical performance, the faster the ability to learn, and the applied concept of kinetic capabilities is related to the process of receiving and coordinating.\textsuperscript{3}

Through the researcher’s work in teaching in schools and universities, he noticed the weak skill level of table football players, and after reviewing many studies in the field of table football, he found that the reason for the decline in players is the weakness of physical fitness, which in turn leads to a low level of skill, and this leads to a low level of skill, which leads to a low level the researcher pushed for this study with the aim of identifying the level of physical abilities of the Ping-Pong players and the impact of sports forums’ proximity to their schools in influencing that development that helps to stabilize the level of motor and skill performance in this game.

Research Objectives:
1. Preparing a survey questionnaire for forum goers and table tennis practitioners.
2. Identify the differences between students who attend the forums, whether or not in terms of physical abilities, skill performance, and results of table tennis.

Research Hypotheses:
- There are statistically significant differences between the results of the peripheral schools in the forums or not in the physical capabilities and the results of the matches.

Research Fields:
- The human field for middle school students
- Time range: (10/12/2018) until (1/2/2019).
- Spatial field Sports forums in the center of Karbala Governorate.

Research methodology and procedures

Research Method: The researcher used the descriptive research method in the comparative study method using the pre- and post-measurement method of two groups, which are equivalent to the suitability of the nature of this study.

Research community and sample: The research community is composed of (415) prep school students in the holy Karbala students who are enrolled in the first semester of the academic year (2018/2019) in the holy city of Karbala. The research sample was chosen intentionally, and it reached (33) students who were chosen from the research community represented by table tennis players participating in the General Directorate for Karbala Holy Education for Table Tennis, and they were divided into two groups according to the presence of their areas of residence near the group The first (16) students are residents of the areas where youth forums exist, and the second group (17) students are residents of areas where youth forums do not exist. From table (1) it is clear that there are no statistically significant differences between age, height and weight for the research community, which indicates their homogeneity, while table (2) shows the parity between the two groups, as it becomes clear from the table that there are no statistically significant differences between the two groups on the two groups. Represented by (compatibility, accuracy, flexibility, agility, reaction speed, transitional velocity, the distinctive velocity of the arms of the arms, the force distinguished by the speed of the legs) and this is evidence of the parity of the members of the two groups in the field of study in the structure level of the course.
It is evident from Table (1) that there are no statistically significant differences between age, height and weight, as the value of all torsion is between ± 3. It is clear from the table (2) no differences are statistically significant between the two groups in each of the elements of physical fitness actress (b compatibility, accuracy, flexibility, agility, speed of reaction, the transition speed, distinctive power speed of arms, distinctive force as quickly as the legs), which is evidence that the two groups have equal levels of physical fitness before starting research.

The following devices and tools:

- Dynamometers (to measure the grip force kg), Rest meter for measuring length (cm), distance measuring tape (meters), Swedish seat, adhesive characters, tennis balls, cabins, cabins, cabins Table tennis, table tennis, special table tennis balls.

Special physical tests:
- Test the numbered circuits - to measure compatibility.
- Hand aiming at overlapping rectangles - to measure accuracy.
- Bend the torso forward to stand - to measure flexibility.
- Backlash running - to measure agility.
- Ruler Nelson - to measure the reaction speed.
- Counting a meter (30 m) from a moving start - to measure the transition speed.
- Throw the medical ball (kg 3), - to measure the strength of the arms.
- Wide leap of stability - to measure the capacity of the legs.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>17.25</td>
<td>0.93</td>
<td>17</td>
<td>0.80</td>
</tr>
<tr>
<td>Length</td>
<td>159.7</td>
<td>4.60</td>
<td>160</td>
<td>0.9</td>
</tr>
<tr>
<td>Mass</td>
<td>57.56</td>
<td>13.73</td>
<td>65</td>
<td>1.62</td>
</tr>
</tbody>
</table>

Table 1. Shows the sample distribution in terms of length, age and weight (homogeneity)

<table>
<thead>
<tr>
<th>Physical ability</th>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>df</th>
<th>(t) value *</th>
<th>Significant value</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatibility (sec)</td>
<td>First</td>
<td>6.11</td>
<td>0.90</td>
<td>31</td>
<td>1.38</td>
<td>0.176</td>
<td>No sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>6.63</td>
<td>1.23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy (degree)</td>
<td>First</td>
<td>7.13</td>
<td>1.75</td>
<td>31</td>
<td>1.42</td>
<td>0.16</td>
<td>No sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>8</td>
<td>1.76</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexibility (cm)</td>
<td>First</td>
<td>6</td>
<td>1.90</td>
<td>31</td>
<td>0.66</td>
<td>0.511</td>
<td>No sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>5.47</td>
<td>2.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fitness (degree)</td>
<td>First</td>
<td>14.75</td>
<td>1.29</td>
<td>31</td>
<td>1.20</td>
<td>0.23</td>
<td>No sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>15.47</td>
<td>2.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reaction speed (cm)</td>
<td>First</td>
<td>21.81</td>
<td>4.17</td>
<td>31</td>
<td>1.65</td>
<td>0.10</td>
<td>No sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>19.05</td>
<td>5.29</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transition speed (w)</td>
<td>First</td>
<td>8.99</td>
<td>1.52</td>
<td>31</td>
<td>0.82</td>
<td>0.419</td>
<td>No sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>8.39</td>
<td>2.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fast power two arms (cm)</td>
<td>First</td>
<td>3.08</td>
<td>0.44</td>
<td>31</td>
<td>1.66</td>
<td>0.106</td>
<td>No sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>3.35</td>
<td>0.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quick power legs (cm)</td>
<td>First</td>
<td>135</td>
<td>24.22</td>
<td>31</td>
<td>0.75</td>
<td>0.462</td>
<td>No sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>142.18</td>
<td>30.51</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significance in front of the level ≤ 0.05.
Skill performance tests:
• After reviewing the scientific references specialized in the tests in the field of table football, the following tests were chosen after they were presented to the experts:
  • Jane-die and Wayne tested to measure table tennis skill.
  • Test the transmission skill for the front strike.

Pilot study: The researcher conducted the survey study on a sample of students that reached (10) students from outside the study sample and from the study community, the researcher applied to them the tests of physical fitness elements to ensure the scientific validity of the tests, and the validity of the used tools used on the used materials.

Scientific Transactions Tests:

Validate the tests: To ensure the validity of the study tests, the researcher used the validity of the content, as he selected it after reviewing many theoretical studies and reliable sources that indicated that these tests are characterized by a high level of honesty and reliability factors. The tests selected were a group of experts on table football who agreed to achieve these tests for the desired objectives of the study.

Tests are consistent: To confirm the consistency of the tests, a sample was conducted on (10) students from the study community. The researcher used the test-retest method, and the validity was verified by extracting a correlation coefficient (correlation of 1), correlation (1 correlation), (1 correlation correlation) 0.83) Accuracy (0.79) Flexibility, (0.86) Agility, Reaction speed, (0.89), (0.85) Transition speed, Distinguished strength with speed (0.90), Rapid power for legs (0.86).

Pretests and training practice in the forums: The members of the first group practiced exercises in the forums near their areas of residence during the summer vacation and the beginning of the school year, and the second group was not able to practice these exercises because of the absence of these forums. These tests were applied to both groups, then the groups were left within a period of (8) weeks, after which the post-tests were performed.

Statistical processing: The researcher used the SPSS software for data analysis, where the mean is calculated. Standard deviation. Difference test t-test.

Results and Discussions
There were statistically significant differences at (0.05) in the physical fitness level of table tennis game among members of the first group who play the game in forums between the pre and remote measurements from the second group that did not play the game in the forums (and for the benefit of dimensional measurements 3 and the results of the group 3).

<table>
<thead>
<tr>
<th>Physical ability</th>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>df</th>
<th>(t) value *</th>
<th>Significant value</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatibility (sec)</td>
<td>First</td>
<td>6.11</td>
<td>0.90</td>
<td>15</td>
<td>15.93</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>5.03</td>
<td>0.68</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy (degree)</td>
<td>First</td>
<td>7.13</td>
<td>1.75</td>
<td>15</td>
<td>16.23</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>11.56</td>
<td>1.41</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexibility (cm)</td>
<td>First</td>
<td>6</td>
<td>1.90</td>
<td>15</td>
<td>8.49</td>
<td>0.00</td>
<td>Sig.</td>
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<tr>
<td></td>
<td>Second</td>
<td>14.88</td>
<td>3.70</td>
<td></td>
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<td></td>
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<tr>
<td>Fitness (degree)</td>
<td>First</td>
<td>14.75</td>
<td>1.29</td>
<td>15</td>
<td>15.80</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>20.13</td>
<td>2.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reaction speed (cm)</td>
<td>First</td>
<td>21.81</td>
<td>4.17</td>
<td>15</td>
<td>20.43</td>
<td>0.00</td>
<td>Sig.</td>
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<tr>
<td></td>
<td>Second</td>
<td>16.06</td>
<td>4.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transition speed (w)</td>
<td>First</td>
<td>8.99</td>
<td>1.52</td>
<td>15</td>
<td>11.64</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
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<td></td>
<td>Second</td>
<td>8.21</td>
<td>1.46</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Table 4. Shows the results of the group practicing any training in the forums

<table>
<thead>
<tr>
<th>Physical ability</th>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>df</th>
<th>(t) value *</th>
<th>Significant value</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast power two arms (cm)</td>
<td>First</td>
<td>6.11</td>
<td>0.90</td>
<td>15</td>
<td>15.93</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>5.03</td>
<td>0.68</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quick power legs (cm)</td>
<td>First</td>
<td>7.13</td>
<td>1.75</td>
<td>15</td>
<td>16.23</td>
<td>0.00</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>11.56</td>
<td>1.41</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The data in Table 3 indicates the existence of statistically significant differences at the level of significance (α≤0.05). This indicates an improvement in the level of physical fitness elements of the experimental group members between the pre and post measurements, and in favor of the measurement. The data in Table (4) show the difference in significance at the level (0.05) for the physical fitness elements of the table tennis game in the ranks of the second group in the elasticity, the force distinguished by the speed of the arms, while the rest of the results showed the presence of statistically significant differences between the statistics, the measurement between the statistics Transition velocity, force distinguished by the velocity of the legs of the second group. The improvement in the level of the elements of special physical fitness among the first group members indicates the high level of the efficiency of the body systems to meet the physical burdens, which indicates the improvement of the physical characteristics of the racquet games in general and the table tennis in particular; and this is what is shown in this system. With many studies that confirmed that its training program has a positive and active role in improving the elements of physical fitness, all of which confirmed that the training program is training in training. Physical and skill for sporting activities and here the researcher would like to point out that youth forums play the role of regular training programs in promoting and raising the degree of physical fitness, whereas the second group that did not have the opportunity to practice training in forums for the lack of these forums in their areas of residence as it did not show improvement in all of the elements of fitness the physical nature of the game of backgammon, especially the one that greatly affects the performance of the game’s skills (accuracy, compatibility, speed of reaction, the characteristic strength of speed for the legs, agility) As it improves, it has elements (the speed-specific strength of the flexible arms) that may have evolved.
Performing table tennis skills during working hours or opportunities. In order to determine the preference in the results for both groups, the researcher conducted a test (t) between the dimensional measurements of both groups as shown in Table (5).

<table>
<thead>
<tr>
<th>Physical ability</th>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>df</th>
<th>(t) value *</th>
<th>Significant value</th>
<th>Type of significance</th>
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<tbody>
<tr>
<td>Compatibility (sec)</td>
<td>First</td>
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<td>0.68</td>
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<td>4.07</td>
<td>0.00</td>
<td>No sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>6.74</td>
<td>1.26</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Accuracy (degree)</td>
<td>First</td>
<td>11.56</td>
<td>1.41</td>
<td>31</td>
<td>7.58</td>
<td>0.00</td>
<td>No sig.</td>
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<tr>
<td></td>
<td>Second</td>
<td>8.23</td>
<td>1.05</td>
<td></td>
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</tr>
<tr>
<td>Flexibility (cm)</td>
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<tr>
<td></td>
<td>Second</td>
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<td>2.53</td>
<td></td>
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<td>Fitness (degree)</td>
<td>First</td>
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<td>2.16</td>
<td>31</td>
<td>4.45</td>
<td>0.000</td>
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<td></td>
<td>Second</td>
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<td></td>
<td></td>
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<tr>
<td>Reaction speed (cm)</td>
<td>First</td>
<td>16.06</td>
<td>4.15</td>
<td>31</td>
<td>2.17</td>
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<tr>
<td></td>
<td>Second</td>
<td>19.12</td>
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<td>Transition speed (w)</td>
<td>First</td>
<td>8.99</td>
<td>1.52</td>
<td>31</td>
<td>11.64</td>
<td>0.00</td>
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</tr>
<tr>
<td></td>
<td>Second</td>
<td>8.21</td>
<td>1.46</td>
<td></td>
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<tr>
<td>Fast power two arms (cm)</td>
<td>First</td>
<td>4.74</td>
<td>0.59</td>
<td>31</td>
<td>6.95</td>
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<tr>
<td></td>
<td>Second</td>
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<td>0.41</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quick power legs (cm)</td>
<td>First</td>
<td>178</td>
<td>20.19</td>
<td>31</td>
<td>4.51</td>
<td>0.00</td>
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</tr>
<tr>
<td></td>
<td>Second</td>
<td>142.73</td>
<td>24.48</td>
<td></td>
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</tr>
</tbody>
</table>

From Table (5), there are statistically significant differences at the significance level ($\alpha \leq 0.05$) in the fitness level for the game of table tennis between the two dimensional tests for the first and second groups, and for the benefit of the first group.

The researcher attributes these results to the effectiveness of youth forums in enhancing physical abilities, in which the members of this group practiced different and qualitative training for agility, speed, compatibility and accuracy, which contributed to improving the levels of these elements among the members of this group, and the compatibility of this group with indicated that the development of some special physical characteristics has a positive effect on the physical and skills level improvement. They had this opportunity, which helped them to develop each element of physical fitness for the game of table tennis, which had a great role in differentiating the first from the second, which applied general exercises and taught training skills only. pointed out that “physical preparation is considered one of the most important components of success in the performance of movement activities, which aims to develop the individual’s athletic potential and improves the level of his physical, psychological, functional and mobility abilities to meet the requirements of the aspirations and the requirements of movement.13 The development in the physical level of the members of the first group who had the opportunity of training and continuous practical practice by virtue of the presence of forums in their residential areas was also reflected in their achievement and victory in the school championship much better than the second group that did not receive training in these forums.14

**Conclusions**

1. The results showed the effectiveness of the presence of forums in residential areas and their impact on improving the fitness elements of table tennis among members of the first group close to these forums.
2. Training in these forums contributed to the improvement of the skill performance of the first group by winning the school championship.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding

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Evaluation the Level of Hepcidin and Iron Homeostasis in Sera of Pregnant Women with Anemia in Samarra City

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¹Post Graduate, ²Prof., Department of Chemistry, College of Education, University of Samarra, Salah al-Din/Iraq

Abstract

Cross sectional study was carried out to evaluate the level of hepcidin in sera of pregnant women with anemia. The study include 86 sample from women with reproductive age(18-35)year. Forty six sample collected from pregnant women with anemia and forty sample from healthy pregnant women as control group in 2nd and 3rd trimester, all samples were collected from Healthy center and Specialized Clinics in Samarra for the period from 14 December 2018 to 22 January 2019.

The study include the determination of Packed cell volume (P.C.V) ratiohemoglobin-Hb conc., Total Iron, total iron binding capacity-TIBC conc., Transferrin conc., Hepcidin conc., Total protein –TP conc., Albumin conc, Globulin conc., The activity of liver enzymes (Alanine aminotransferase-ALT, aspartate aminotransferase–AST and Alkaline phosphatase-ALP), the results showed that the levels of PCV ratio, Hb, total iron and hepciden significant decreased p≤0.05 in pregnant women with anemia as compared with control group, with significant p≤0.05 increase in level of TIBC, Transferrin, and the activity of AST and ALP in pregnant women with anemia as compared with control group, with no significant change p≤0.05 to the level of total protein, albumin, globulin and the activity of ALT in pregnant women with anemia as compared with control group.

Keywords: Hepcidin, anemic pregnant women, total iron, Transferrin, liver enzymes.

Introduction

Pregnancy or gestation, is the period which one or more fetal develop inside the mother’s womb, In which the unborn baby spends about 38-40 weeks in the uterus. It’s not an illness, but it’s a stressful condition in which manyphysiological and metabolic functions are altered to a considerable extent¹,². Many medical problems were increase during pregnancy due to complex interplay between lifestyle and demographic factors. This medical problems include gestational diabete, venous thromboembolism, hypertension and anemia³.

Anemia is common in pregnancy, and it’s a risk factor for infant low birth weight and iron deficiency anemia, as well as deem as one of the main risk factors for take part in 20-40% of mother deaths directly or indirectly through preeclampsia, cardiac failure, preeclampsia, puerperal sepsis, antepartum haemorrhage and postpartum haemorrhage⁴,⁵.

Mostly, anemia in pregnancy is caused to reduction of iron deficiency or folic acid deficiency or both. Folate and Iron supplementation is fixed during pregnancy to block the complications. The hemoglobin concentration in normal pregnancy, becomes diluted according to the elevate the volume of circulating blood⁶,⁵. The regulation of iron metabolism is done by Hepcidin⁷.

Hepcidin, is a peptide hormones (composed of 25 amino acids), Its a main regulator of iron metabolism⁷. It is mainly synthesized in the liver. The mechanism of the regulations for the iron metabolism is done by the inhibition the absorption of iron in the duodenum by acting mobilization of liver iron Slack⁸,⁹.
The aim of the present study is to evaluate the level of hepcidin and iron homeostasis in sera of pregnant women with anemia in Samarra city.

**Materials and Method**

**Study Design:** Cross sectional study was carried out to 86 samples from pregnant women with reproductive age (18-35) year. Forty six sample collected from pregnant women with anemia as patients group and forty sample from healthy pregnant women as control group in 2nd and 3rd trimester, all samples were collected from Specialized Clinics and Healthy center in Samarra city for the period from 14 December 2018 to 22 January 2019.

**Method:** The study include determination of blood hemoglobin-Hb concentration, packed cell volume-PCV and also determination the concentration of serum hepcidin, total iron, total iron binding capacity-TIBC, transferrin, Transferrin saturation, total protein, albumin and liver enzymes (aspartate aminotransferase –AST, Alanine aminotransferase-ALT, and Alkaline phosphatase –ALP) activity according to the standard method.

**Statistical Analysis:** The results were analyzed using the Statistical Package for the Social Sciences-SPSS using the Completely randomized design-CRD method through a t-test to analyze the variance between two groups and at a probability level (P≤ 0.05) and with this analysis, the simple linear

**Results**

The present study include determination of blood Hb concentration, PCV ratio and hepcidin, total iron, TIBC, transferrin, Transferrin saturation, total protein, albumin, globulin concentration in sera of anemic pregnant women as patient group and pregnant women without anemia as control group.

The results indicate that the Mean±SD of Hepcidin were 5.878 ± 1.699 ng/ml in sera of pregant women with anemia as patient group and 8.260 ± 1.912 ng/ml in sera of pregnant women without anemia as control group, table 1.

Table 1: Mean±SD of hepcidin, Hb, PCV, total iron, TIBC, transferrin, Transferrin saturation, total protein, albumin, globulin concentration in patients and control groups

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Mean ±S.D</th>
<th>P ≤</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>Patients</td>
</tr>
<tr>
<td>Hepcidin (ng/ml)</td>
<td>8.260 ± 1.912</td>
<td>5.878 ± 1.699</td>
</tr>
<tr>
<td>P.C.V (%)</td>
<td>38.55 ± 1.205</td>
<td>34.021 ± 1.939</td>
</tr>
<tr>
<td>Hb (g/dl)</td>
<td>12.5402 ± 0.436</td>
<td>10.99 ± 0.627</td>
</tr>
<tr>
<td>Iron (µmol/L)</td>
<td>36.788 ± 7.086</td>
<td>16.611 ± 3.479</td>
</tr>
<tr>
<td>T.I.B.C (µmol/L)</td>
<td>77.83 ± 13.213</td>
<td>92.373 ± 14.708</td>
</tr>
<tr>
<td>Transferrin saturation (%)</td>
<td>49.463 ± 16.906</td>
<td>18.906 ± 6.827</td>
</tr>
<tr>
<td>Transferrin (µmol/L)</td>
<td>54.235±9.237</td>
<td>65.433± 10.061</td>
</tr>
</tbody>
</table>

Table 1 also showed that the Mean±SD of PCV ratio were 34.021 ± 1.939% in blood of patient group and 38.55 ± 1.205% in blood of control group, while the concentration of Hb 10.99 ± 0.627 g/dl in blood of patient group and 38.55 ± 1.205 in control group. The total iron concentration were 16.611 ± 3.479 µmol/L in sera of patient group and 12.5402 ± 0.436 µmol/L in control group, also the concentration of TIBC were 92.373 ± 14.708 µmol in patient group and 77.83 ± 13.213 µmol/L in control group. The ratio of Transferrin saturation were 18.906 ± 6.827% and 49.463 ± 16.906% in pateints and cotrol group respecivley. As well as the concentration of transferrin were 65.433± 10.061 µmol/L and 54.235±9.237 in patents and cotrol group respecivley.

The results obtained from Table 1 indicate that the level of Hepcidin,PCV,Hemoglobin, total iron, Transferrin saturation were significantly decreased at p≤0.05 in sera of pregnat women with anemia as
comparing with pregnant women without anemia as control group. While the level of TIBC and Transferrin were significantly increased at p≤0.05 in sera of patients group as copmare with control group.

Table 2 showed the Mean±SD of total protein, albumin and globulin concentration in sera of patient and control groups.

Table 2: Mean±SD of serum total protein, albumin and globulin concentration in patient and control groups.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Mean ±S.D</th>
<th>Control</th>
<th>Patients</th>
<th>P ≤</th>
</tr>
</thead>
<tbody>
<tr>
<td>T.P. (g/dl)</td>
<td></td>
<td>6.188 ±0.586</td>
<td>6.329 ±0.684</td>
<td>N.S*</td>
</tr>
<tr>
<td>Albumin (g/dl)</td>
<td></td>
<td>4.430 ± 0.627</td>
<td>4.012 ±0.780</td>
<td>N.S</td>
</tr>
<tr>
<td>Globulin (g/dl)</td>
<td></td>
<td>1.794 ±0.954</td>
<td>2.255 ±1.134</td>
<td>N.S</td>
</tr>
</tbody>
</table>

*N.S. = Non-significant

Table 2 showed the Mean±SD for total protein concentration were 6.329 ±0.684g/dl in patient group and 6.188 ±0.586g/dl in control group, while the concentration of albumin were 4.012 ±0.780 g/dl in patient group and 4.430± 0.627g/dl in control group. The concentration of globulin were2.255 ±1.134g/dl and 1.794 ±0.954g/dl in pateints and control group respecrivley.

The results obtained from table 3 showed that the activity of ALP were significantly increased at p≤0.05 in sera of pregant women with anemia as coparing with pregnant women without anemia as control group, while the AST was significantly at p≤0.05 decreased in sera of patient group, with no significant variation for ALT between patients and control group.

Discussion

In pregnancy the concentration of hepcidin significantly reducing gradually from the 1st, to the 2nd and 3rd trimesters and reach undetectable levels, The level of hormone correlate with iron parameters during pregnancy, in which hepcidin able to provide. Maximal bioavailability. of iron for fetus and mother.
The results of the present study was agree with finding of Manolov et al.\(^{(11)}\), which indicate that the level of hepcidine significantly decreased in sera of pregnant women with anemia as compared with pregnant women without anemia and pregnant women with anemia of chronic inflammation. This study conclude that the decrease and increase in serum hepcidin concentration provides a backbone for choosing the right therapeutic process in the treatment of anemia in pregnancy. Hepcidin able to provide, maximal bioavailability of iron for fetus and mother, Because its plays an important role in regulation the concentration of iron in human body via release of iron from macrophages and repression of iron absorption from intestine\(^{(12)}\).

Wahed et al.\(^{(13)}\), found that the serum total iron significantly elevated in second and third trimester of pregnant women which take iron supplement as compared with same category of women were not take iron supplemet, other wise the TIBC also increased in groups of anemic pregnant women who take iron supplemente, or rich diet with iron.

The results of the present study were agree with the finding of Zaidan\(^{(14)}\), which found that the level of Total iron, Hb and PCV were significantly decreased, while the result of total protein, albumin and globulin significantly elevated in anemic pregnant women, this finding were disagreement with the finding of the present study, and the results of liver enzymes was agree with finding of the present study about ALT (but not AST), Which found that AST and ALT dont effect during anemic pregnant women but ALP was increased in 60% of samples for this study.

Form all the results we can conclude that the iron deficiency reduced the level of hepcidine in anemic pregnant women.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** non

**Funding:** Self-funding

**References**

Study the Effect of the Nanomaterial of the Gold Metal Prepared by Laser Ablation Method on Healthy Human Blood

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¹Physician, ²Prof., University of AL-Qadisiyah, Department of Physics, Iraq

Abstract

The golden nanoparticles were prepared by pulse laser ablation (PLA) by the liquid phase method. Lasers (Nd: Yag) (1064nm (80mJ) wavelength) are used in different pulses (200, 400, and 600), and deionized distilled liquid water (DDDW) is used. The prepared nanomaterial was added by laser ablation and with three laser pulses to a peaceful blood sample, where the nanomaterial was added in different concentrations 2, 4, 5 ml to 1 ml of blood. A blood image was taken for each sample, where the total samples became 9 samples and compared with a sample of healthy blood. It was observed that the general observation of rates and in general of all components of blood tissues has decreased significantly and very dangerous and also frightening with increasing concentration of both nanomaterial’s and increased number of laser pulses per minute compared to normal rates and control sample readings.

Keywords: Golden nanoparticles; Lasers (Nd: Yag); blood; laser ablation.

Introduction

Blood is a connective tissue consisting of red blood cells, white blood cells, plasma and platelets, which is absolutely necessary for living organisms, there is no life without it, where blood makes up eight percent of body mass, or about five liters, blood has many functions, it will We talk in addition to talking about red blood cells and white blood cells.

Blood functions are the defense of the body by producing antibodies that fight germs, getting rid of attacking microbes, which cause many diseases and water balance in the body, which maintains the water balance in the body, by transferring excess water from the body and intestines, or expel it from During the skin as a sweat, or through the kidneys as a urine. And regulate body heat by secreting sweat to moisturize the skin, or by increasing the burning of blood sugar in order to generate energy, raise body temperature. Temporarily stop bleeding by platelets that block the bloodstream, then produce elements that help heal wounds. Substances such as oxygen, liquids, food, hormones and vitamins are delivered to all parts of the body, then returned with carbon dioxide and food waste after being converted into energy in the body with some other substances to be released into the cells. The blood components are plasma, the liquid substance in the blood, and the transparent color tends to yellow, the plasma constitutes 55% of the components of the blood, and water constitutes 90% of the blood plasma, while less than 10% of the plasma is soluble substances mostly are Proteins, in addition to vitamins and nutrients, such as glucose and amino acids. The main function of plasma is the transfusion of blood throughout the body, as well as the transport of nutrients, cellular waste products, antibodies and...
coagulation proteins and hormones. Maintaining the body’s balance. Red blood cells. The cellular components in the blood, most numerous, are produced in the bone marrow. Its size is small, circular, double concave. Their shape and flexibility help them pass through small blood vessels. Red blood cells are surrounded by a membrane consisting of fats and proteins. Red blood cells contain hemoglobin. The main red blood cells transfer oxygen from the lungs to the tissues and carry carbon dioxide and waste from the tissues to the lungs to get rid of carbon dioxide, kidneys and liver to get rid of other wastes. Platelets. Platelets are the smallest blood cells, made in the bone marrow. Their diameter ranges from 2 to 4 micrometers, ranging from 150,000-400,000 per cubic millimeter of blood, but despite the large number, they occupy a small portion of platelets that lack the nucleus and are therefore unable to divide. The lifespan of platelets ranges from seven to ten. The main function of platelets is bleeding, or wounds that stop it. White blood cells. White blood cells form within the bone marrow. By producing antibodies, most white blood cells have a lifespan of only a few hours to several days, but there are some cell types that can remain in the body for many years. Each year, the greater the number of white blood cells or the regression has medical implications, many diseased white blood cells are classified into five main types, cellular neutrophils (neutrophils) specializing in the defense against bacterial infections, especially bacterial infections and burns, strokes, And wounds. Lymphocytes form a line of defense in the body against viral infections, such as cytomegalovirus viral hepatocytes and monocytes. Monocytes rise in chronic inflammation: eosinophil’s rise in response to parasitic infections, basophils are primarily responsible for responding to allergies, histamine secretion, leading to aneurysm. 

![Figure (2): Samples of Nano-particles (200,400,600) pulses](image)

**Experimental:** A healthy blood sample was withdrawn from a healthy volunteer person. hence took 10 ml sample from health person, divided this sample to 10 test tubes in the amount of 1 ml in each test tube. all test tubes contain (intejent) to save blood from clotting. This healthy blood sample was mixed with laboratory sample this sample is a Nanomaterial with different concentration. three pulses (200, 400 and 600) The samples are shown in Figure (2) added this Nanomaterials which have different pulses to the healthy blood sample with different concentrations (2, 4 and 5)ml into the three samples at the same time. At this stage, these samples placed in a roll mixer device to mixed (Nano materials and healthy blood) together to obtain the result of this mixed by laboratory test for each mixed sample. The process took (process putting mixed materials on the roll mixer device five minutes) and then began to check a sample after another, including the healthy sample in the Mindray to get a picture of blood for each sample. Note that all samples remained on the roll mixer device during the checking process of other samples. In the results of a blood image shown in the following table with 200 pulse added to it have 2 ml of nanomaterial, gold metal to 1 ml of healthy blood, it observed a decrease in the number of units and the amount of white blood cells under the normal rate even when compared with the sample control 7.21 and also we note a decrease in all levels of granular and non-granular without the normal rates (0.611 -1.071- 0.03-0.48) for the Neu, Lym, Mon, Eos blood cell types according to order, and this is confirmed by the low percentage of these blood cells according to the rate found in the results of the tests with 200 pulses and 2 ml of nanomaterial. It is also observed a significant decrease in the number of red blood cells compared with the normal rates and with the control sample. This led to a difference in the general characteristics of the sphere and the indicator in the readings such as the size of the HCT and the average size of the red blood cell MCV, but a rise in the average hemoglobin in one MCHC is observed. It causes many diseases, such as diseases of low red blood cells and anemia. It is also noted that these laser flashes affect the amount, size and shape of the PLT, which was also read in decreasing numbers. This is a dangerous indication that causes delayed or no blood clotting in wounds or what is known as Thrombopenia. This is also illustrated by the graphs found in the results of the blood image, where a difference in the distribution of blood cells is noted, and the decrease in the numerical pyramid of red blood cells. It is noticed that the decrease in the white blood cells in the concentration of 2 ml has increased until it reached 0.42 at the concentration of 4 ml, but it returned and rose to 1.18 at 5 ml, i.e. the
increase is not a direct increase in the concentration of the nanomaterial, but it remains below the normal rates. This was also the case with RBCs, where it was 1.36 at 2 ml and 0.64 at concentration of 4 ml and then returned and decreased to 0.78 at a concentration of 5 ml of nanomaterial. The same effect was repeated on the thrombocytopenia, where it was 52 at a concentration of 2 ml, decreased sharply at a concentration of 4 ml, then increased slightly 12 at a concentration of 5 ml, but it is also below the normal rates (100-400) and indicates a significant decrease, but rather a great risk.

Table (1): The results of the blood image after adding the gold nanomaterial with 200 pulse

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameter</th>
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<th>4 ml</th>
<th>5 ml</th>
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<td>WBC</td>
<td>2.19</td>
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<td>1.18</td>
<td>7.21</td>
<td>10^9/L</td>
</tr>
<tr>
<td>2</td>
<td>Neu#</td>
<td>1.07</td>
<td>0.42</td>
<td>0.01</td>
<td>4.37</td>
<td>10^9/L</td>
</tr>
<tr>
<td>3</td>
<td>Lym#</td>
<td>0.61</td>
<td>0.00</td>
<td>1.14</td>
<td>2.22</td>
<td>10^9/L</td>
</tr>
<tr>
<td>4</td>
<td>Mon#</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.49</td>
<td>10^9/L</td>
</tr>
<tr>
<td>5</td>
<td>Eos#</td>
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<td>0.00</td>
<td>0.03</td>
<td>0.12</td>
<td>10^9/L</td>
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<tr>
<td>6</td>
<td>Bas#</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.01</td>
<td>10^9/L</td>
</tr>
<tr>
<td>7</td>
<td>Neu%</td>
<td>48.5</td>
<td>+++++</td>
<td>1.4</td>
<td>60.7</td>
<td>%</td>
</tr>
<tr>
<td>8</td>
<td>Lym%</td>
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<td>0.0</td>
<td>96.4</td>
<td>30.8</td>
<td>%</td>
</tr>
<tr>
<td>9</td>
<td>Mon%</td>
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<td>0.0</td>
<td>0.1</td>
<td>6.8</td>
<td>%</td>
</tr>
<tr>
<td>10</td>
<td>Eos%</td>
<td>1.5</td>
<td>0.0</td>
<td>2.0</td>
<td>1.6</td>
<td>%</td>
</tr>
<tr>
<td>11</td>
<td>Bas%</td>
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<td>0.0</td>
<td>0.1</td>
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<td>%</td>
</tr>
<tr>
<td>12</td>
<td>RBC</td>
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<td>0.64</td>
<td>0.78</td>
<td>5.14</td>
<td>10^12/L</td>
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<td>HGB</td>
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<td>16.1</td>
<td>g/dL</td>
</tr>
<tr>
<td>14</td>
<td>HCT</td>
<td>8.1</td>
<td>2.9</td>
<td>3.4</td>
<td>45.1</td>
<td>%</td>
</tr>
<tr>
<td>15</td>
<td>MCV</td>
<td>59.4</td>
<td>44.9</td>
<td>43.4</td>
<td>87.8</td>
<td>fL</td>
</tr>
<tr>
<td>16</td>
<td>MCH</td>
<td>31.3</td>
<td>31.1</td>
<td>31.2</td>
<td>31.4</td>
<td>Pg</td>
</tr>
<tr>
<td>17</td>
<td>MCHC</td>
<td>52.7</td>
<td>69.2</td>
<td>71.8</td>
<td>35.7</td>
<td>g/dL</td>
</tr>
<tr>
<td>18</td>
<td>RDW-CV</td>
<td>35.8</td>
<td>33.4</td>
<td>33.3</td>
<td>12.5</td>
<td>%</td>
</tr>
<tr>
<td>19</td>
<td>RDW-SD</td>
<td>72.8</td>
<td>41.8</td>
<td>45.0</td>
<td>41.9</td>
<td>fL</td>
</tr>
<tr>
<td>20</td>
<td>PLT</td>
<td>52</td>
<td>8</td>
<td>12</td>
<td>204</td>
<td>10^9/L</td>
</tr>
<tr>
<td>21</td>
<td>MPV</td>
<td>8.0</td>
<td>7.7</td>
<td>8.3</td>
<td>8.4</td>
<td>fL</td>
</tr>
<tr>
<td>22</td>
<td>PDW</td>
<td>14.2</td>
<td>14.6</td>
<td>13.8</td>
<td>16.1</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>PCT</td>
<td>0.41</td>
<td>0.06</td>
<td>0.10</td>
<td>1.72</td>
<td>mL/L</td>
</tr>
</tbody>
</table>

Results and Discussion

It has been observed that by increasing the number of laser pulses from 200 to 400 pulses when preparing the nanomaterial, gold is observed to decrease all components of blood tissue below the normal levels and further, as the level of white blood cells decreased at a concentration of 2 ml to 2.29 and at a concentration of 4 ml 1.86 and at a concentration of 5 ml to 0.37 This is due to the decrease in all types of white blood cells until some of them were completely nonexistent, which is neutrophil, and its percentage was 0% at a concentration of 5 ml of the added nanomaterial. It was also observed that the decrease became inverse, as the rates decreased with respect to white blood cells (0.37, 1.81, 2.29) at concentrations (2,4,5) ml, and successively where it was repeated with the rates of erythrocytes (0.57,1.18,1.42) in the same sequence and also with the rates Platelets (9,43,56) ml and at the same concentrations It is noted that all parameters remain below the normal ones, but they have declined to more dangerous rates.
Table (2): The results of the blood image after adding the gold nanomaterial with 400 pulse

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameter</th>
<th>2 ml</th>
<th>4 ml</th>
<th>5 ml</th>
<th>Control</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WBC</td>
<td>2.29</td>
<td>1.86</td>
<td>0.37</td>
<td>7.21</td>
<td>$10^9$/L</td>
</tr>
<tr>
<td>2</td>
<td>Neu#</td>
<td>1.02</td>
<td>0.42</td>
<td>0.37</td>
<td>4.37</td>
<td>$10^9$/L</td>
</tr>
<tr>
<td>3</td>
<td>Lym#</td>
<td>0.88</td>
<td>1.36</td>
<td>0.00</td>
<td>2.22</td>
<td>$10^9$/L</td>
</tr>
<tr>
<td>4</td>
<td>Mon#</td>
<td>0.37</td>
<td>0.06</td>
<td>0.00</td>
<td>0.49</td>
<td>$10^9$/L</td>
</tr>
<tr>
<td>5</td>
<td>Eos#</td>
<td>0.02</td>
<td>0.02</td>
<td>0.00</td>
<td>0.12</td>
<td>$10^9$/L</td>
</tr>
<tr>
<td>6</td>
<td>Bas#</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.01</td>
<td>$10^9$/L</td>
</tr>
<tr>
<td>7</td>
<td>Neu%</td>
<td>44.3</td>
<td>22.3</td>
<td>+++++</td>
<td>60.7</td>
<td>%</td>
</tr>
<tr>
<td>8</td>
<td>Lym%</td>
<td>38.2</td>
<td>73.1</td>
<td>0.0</td>
<td>30.8</td>
<td>%</td>
</tr>
<tr>
<td>9</td>
<td>Mon%</td>
<td>16.5</td>
<td>3.3</td>
<td>0.0</td>
<td>6.8</td>
<td>%</td>
</tr>
<tr>
<td>10</td>
<td>Eos%</td>
<td>0.9</td>
<td>1.3</td>
<td>0.0</td>
<td>1.6</td>
<td>%</td>
</tr>
<tr>
<td>11</td>
<td>Bas%</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.1</td>
<td>%</td>
</tr>
<tr>
<td>12</td>
<td>RBC</td>
<td>1.42</td>
<td>1.18</td>
<td>0.57</td>
<td>5.14</td>
<td>$10^{12}$/L</td>
</tr>
<tr>
<td>13</td>
<td>HGB</td>
<td>4.5</td>
<td>3.7</td>
<td>1.8</td>
<td>16.1</td>
<td>g/dL</td>
</tr>
<tr>
<td>14</td>
<td>HCT</td>
<td>8.1</td>
<td>6.4</td>
<td>2.2</td>
<td>45.1</td>
<td>%</td>
</tr>
<tr>
<td>15</td>
<td>MCV</td>
<td>56.6</td>
<td>54.4</td>
<td>39.1</td>
<td>87.8</td>
<td>fl</td>
</tr>
<tr>
<td>16</td>
<td>MCH</td>
<td>31.3</td>
<td>31.0</td>
<td>31.5</td>
<td>31.4</td>
<td>pg</td>
</tr>
<tr>
<td>17</td>
<td>MCHC</td>
<td>55.3</td>
<td>57.0</td>
<td>80.6</td>
<td>35.7</td>
<td>g/dL</td>
</tr>
<tr>
<td>18</td>
<td>RDW-CV</td>
<td>31.4</td>
<td>27.9</td>
<td>31.1</td>
<td>12.5</td>
<td>%</td>
</tr>
<tr>
<td>19</td>
<td>RDW-SD</td>
<td>60.4</td>
<td>50.6</td>
<td>32.7</td>
<td>41.9</td>
<td>fl</td>
</tr>
<tr>
<td>20</td>
<td>PLT</td>
<td>56</td>
<td>43</td>
<td>9</td>
<td>204</td>
<td>$10^9$/L</td>
</tr>
<tr>
<td>21</td>
<td>MPV</td>
<td>7.8</td>
<td>8.4</td>
<td>8.0</td>
<td>8.4</td>
<td>fl</td>
</tr>
<tr>
<td>22</td>
<td>PDW</td>
<td>14.1</td>
<td>14.0</td>
<td>14.1</td>
<td>16.1</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>PCT</td>
<td>0.44</td>
<td>0.36</td>
<td>0.07</td>
<td>1.72</td>
<td>mL/L</td>
</tr>
</tbody>
</table>

As for the increase in the number of laser pulses to 600 pulses, an increased effect on the three main blood components, white blood cells, red blood cells and platelets, was observed. When the number of pulses increased, the WBC decrease decreased until it reached (1.15,1.27,1.98) at concentration (2, 4.5) ml, respectively, as well as with red blood cells until it reached (0.82,0.88,1.37) at the same concentrations as well as low blood platelets, where their number reached (12,15,48) at previous concentrations of nanomaterial. It is noted that the concentration of the nucleic substance is also inversely increasing as the decrease in the blood components increases with increasing the concentration of the nanomaterial. It is noted that the effect of the number of laser pulses per minute also increases the decrease in the blood components. 2.19) consecutively is unclear, and this is exactly what happened with erythrocytes (1.37, 1.42, 1.36) at the three laser pulses in a row and was repeated with platelets.

Table (3): The results of the blood image after adding the gold nanomaterial with 600 pulse

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameter</th>
<th>2 ml</th>
<th>4 ml</th>
<th>5 ml</th>
<th>Control</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WBC</td>
<td>1.98</td>
<td>1.27</td>
<td>1.15</td>
<td>7.21</td>
<td>$10^9$/L</td>
</tr>
<tr>
<td>2</td>
<td>Neu#</td>
<td>0.93</td>
<td>0.00</td>
<td>0.11</td>
<td>4.37</td>
<td>$10^9$/L</td>
</tr>
<tr>
<td>No.</td>
<td>Parameter</td>
<td>2 ml</td>
<td>4 ml</td>
<td>5 ml</td>
<td>Control</td>
<td>Unit</td>
</tr>
<tr>
<td>-----</td>
<td>-----------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>3</td>
<td>Lym#/</td>
<td>0.75</td>
<td>1.24</td>
<td>1.12</td>
<td>2.22</td>
<td>10^9/L</td>
</tr>
<tr>
<td>4</td>
<td>Mon#/</td>
<td>0.27</td>
<td>0.01</td>
<td>0.00</td>
<td>0.49</td>
<td>10^9/L</td>
</tr>
<tr>
<td>5</td>
<td>Eos#</td>
<td>0.03</td>
<td>0.02</td>
<td>0.02</td>
<td>0.12</td>
<td>10^9/L</td>
</tr>
<tr>
<td>6</td>
<td>Bas#</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.01</td>
<td>10^9/L</td>
</tr>
<tr>
<td>7</td>
<td>Neu%</td>
<td>46.6</td>
<td>0.6</td>
<td>1.1</td>
<td>60.7</td>
<td>%</td>
</tr>
<tr>
<td>8</td>
<td>Lym%</td>
<td>37.4</td>
<td>97.0</td>
<td>96.8</td>
<td>30.8</td>
<td>%</td>
</tr>
<tr>
<td>9</td>
<td>Mon%</td>
<td>14.0</td>
<td>1.1</td>
<td>1.9</td>
<td>6.8</td>
<td>%</td>
</tr>
<tr>
<td>10</td>
<td>Eos%</td>
<td>1.9</td>
<td>1.3</td>
<td>0.1</td>
<td>1.6</td>
<td>%</td>
</tr>
<tr>
<td>11</td>
<td>Bas%</td>
<td>0.1</td>
<td>0.0</td>
<td>0.82</td>
<td>0.1</td>
<td>%</td>
</tr>
<tr>
<td>12</td>
<td>RBC</td>
<td>1.37</td>
<td>0.88</td>
<td>2.6</td>
<td>5.14</td>
<td>10^12/L</td>
</tr>
<tr>
<td>13</td>
<td>HGB</td>
<td>4.3</td>
<td>2.8</td>
<td>3.7</td>
<td>16.1</td>
<td>g/dL</td>
</tr>
<tr>
<td>14</td>
<td>HCT</td>
<td>7.6</td>
<td>4.3</td>
<td>45.3</td>
<td>45.1</td>
<td>%</td>
</tr>
<tr>
<td>15</td>
<td>MCV</td>
<td>55.7</td>
<td>48.2</td>
<td>31.7</td>
<td>87.8</td>
<td>fL</td>
</tr>
<tr>
<td>16</td>
<td>MCH</td>
<td>31.1</td>
<td>31.5</td>
<td>31.5</td>
<td>31.4</td>
<td>pg</td>
</tr>
<tr>
<td>17</td>
<td>MCHC</td>
<td>55.8</td>
<td>65.4</td>
<td>70.0</td>
<td>35.7</td>
<td>g/dL</td>
</tr>
<tr>
<td>18</td>
<td>RDW-CV</td>
<td>28.7</td>
<td>30.1</td>
<td>32.5</td>
<td>12.5</td>
<td>%</td>
</tr>
<tr>
<td>19</td>
<td>RDW-SD</td>
<td>53.4</td>
<td>46.1</td>
<td>46.0</td>
<td>41.9</td>
<td>fL</td>
</tr>
<tr>
<td>20</td>
<td>PLT</td>
<td>48</td>
<td>15</td>
<td>12</td>
<td>204</td>
<td>10^9/L</td>
</tr>
<tr>
<td>21</td>
<td>MPV</td>
<td>7.9</td>
<td>7.4</td>
<td>8.0</td>
<td>8.4</td>
<td>fL</td>
</tr>
<tr>
<td>22</td>
<td>PDW</td>
<td>13.9</td>
<td>14.5</td>
<td>14.3</td>
<td>16.1</td>
<td>mL/L</td>
</tr>
<tr>
<td>23</td>
<td>PCT</td>
<td>0.38</td>
<td>0.11</td>
<td>0.10</td>
<td>1.72</td>
<td>mL/L</td>
</tr>
</tbody>
</table>

The general observation of the rates and, in general, of all components of the blood tissue has decreased in a very large and dangerous and also frightening by increasing both the concentrations of the nucleus and increasing the number of pulses of the laser per minute compared to the normal rates and with the readings of the control sample\(^{12-15}\).

**Conclusion**

It was observed when adding the gold nanomaterial to a peaceful blood sample and when taking a blood picture of each sample it was found that the general observation of the rates and in general of all components of the blood tissue has decreased very significantly and dangerous and frightening especially when increasing both the nanomaterial concentrations and increasing the number of pulses of the laser per minute Compared to normal rates and with special readings.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding

**References**

5. Courrol, L. C., de Oliveira Silva, F. R., & Gomes, L. A simple method to synthesize silver nanoparticles by photo-reduction. Colloids and Surfaces A:
Physicochemical and Engineering Aspects, 2007, 305(1-3), 54-57.


Molecular Detection of $bla_{OXA-51}$ in Carbapenem-resistant Acinetobacterbaumannii Isolated from Different Clinical Sources

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¹M.Sc., ²Assist Prof., Department of Biology, College of Science, University of Anbar/Iraq

Abstract

Carbapenems are the drugs of choice against serious infections caused by Gram-negative bacteria Carbapenem-resistant. Acinetobacterbaumannii (CRAB) represents one of the important causing agents of nosocomial infections especially in immunocompromised and Intensive Care Units (ICUs) patients. The aim of this work was to identify the Carbapenem-Resistant genes in Acinetobacterbaumannii isolated from Baghdad and Ramadi hospitals. Among 48 A. baumannii isolates, 33 isolates (68.75%) were resistant to imipenem and meropenem. One gene for carbapenem resistance ($bla_{OXA-51}$ like) were amplified by PCR. The presence of $bla$OXA-51-like genes in 100% of CRAB isolates indicated that the $bla$OXA-51-like genes are the predominant mechanism for imipenem resistance in our isolates.

Keywords: Acinetobacter baumannii; $bla_{OXA-51}$; Health management; genes

Introduction

Acinetobacterbaumannii is a non-fermentative, strictly aerobic, non-motile, non pigmented, catalase-positive and oxidase-negative Gram-negative coccobacillus¹. A. baumannii became clinically important pathogen due to its capability for outbreaks and resistance to most antibiotics including carbapenems². nosocomial infections has become an increasingly prevalent cause especially in immunocompromised and in Intensive Care Units (ICUs) patients in the last few years³.

Carbapenems are the drugs of choice for the treatment of serious nosocomial infections caused by A. baumannii⁴. Carbapenem resistant A. baumannii strains have been now emerged around the world. This resistance is principally caused by the production of carbapenemases⁵. Carbapenem-hydrolysing class D β–lactamases (CHDLs) are the most often reported mechanisms of carbapenem resistance in A. baumannii and four groups of CHDLs have been identified inimipenem-resistant A. baumannii, including intrinsic and chromosomally located OXA-51-like β–lactamases and acquired OXA-23-like, OXA-24-like and OXA-58-like β–lactamases⁶.

Materials and Method

Isolation and processing of samples: 48, urine, wounds, burns, blood and sputum, were collected in sterilized containers from patients attending hospitals in Baghdad and Ramadi city. These strains were isolated through a period extended from August 2019 to December 2019.

All bacterial isolates were diagnosed by conventional method such as morphological, microscopic, and biochemical tests⁷. Additionally, identification was confirmed by Vitek-2 system (Biomerieux; France).

Antibiotic susceptibility was done for two antibiotics available in themarket. Disc agar diffusion test was performed according to the Kirby–Bauer standardized antimicrobial susceptibility single disc method⁸.
An isolate was interpreted as susceptible, intermediate, or resistant to a particular antibiotic by comparison with standards inhibition zones or MIC break point according to Clinical Laboratories Standards Institute (CLSI, 2018).

**Extraction of genomic DNA:** DNA was extracted from *A. baumannii* isolates using a commercial purification system (Genomic DNA purification Kit, Promega, USA), then the DNA concentration and purity were determined.

**Traditional PCR assay:** PCR was achieved to amplify carbapenem resistance genes (oxacillinases) including: *bla* OXA-51-Like genes (which is also adopted for the identification of isolates to species level). Primers used in this study (Alpha DNA, Canada) were provided, in lyophilized form then dissolved in sterile deionized distilled water (Table I).

<table>
<thead>
<tr>
<th>Gene</th>
<th>Primers’ Sequences (5’→3’)</th>
<th>TM (°C)</th>
<th>Product size (bp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OXA-51</td>
<td>F: CGGCCTTGTAATGCTTTGAT</td>
<td>59.4</td>
<td>353</td>
</tr>
<tr>
<td></td>
<td>R: TGGATTGCACCTCATCTTGG</td>
<td>57.3</td>
<td></td>
</tr>
</tbody>
</table>

For PCR method, the initial denaturation phase for each PCR assay with primers was established on 94°C for 5 min also denaturation was 94°C for 1 min. The annealing time was 1 min and temperature was 49°C for. The extension time was 35 sec in 72°C. The final extension was done at 72°C for 7 min.

The reaction of PCR consisted of 12 μl Master mix (Bioneer, USA), 1 μl of each forward and reverse primers, 4 μl of template DNA, and 7 μl PCR grade water to a final volume 25 μl. The products of PCR were electrophoresed for 1 hr and visualized with the aid of Red Safe staining (iNtRON, Korea) and UV transilluminator documentation system.

**Result and Discussion**

During the period of August 2019 to December 2019, forty eight *Acinetobacter baumannii* were collected from Ramadi city and Baghdad. The collected isolates were from different clinical specimens (urine, wound, sputum, and burns) of in patients in this hospital. All isolates were identified by using the automated Vitek-2 system (Bio-Merieux/France) according to the manufacturer’s instructions with the using ID-GNB (Identification card - Gram Negative Bacteria).

**Antibiotic susceptibility testing:** The antibiotic susceptibility test revealed that (68.75%) carbapenem-resistant *A. baumannii* from 48 clinical strains were multidrug-resistant.

**Molecular detection of bla OXA-51 in *A. baumannii* by traditional PCR:** *A. baumannii* has successfully become a significant nosocomial pathogen because of its remarkable ability to acquire antibiotic resistance and to survive in nosocomial environments. The *bla* OXA-51-like genes were reported to be highly specific for the identification of *A. baumannii* at the species level (9). PCR product illustrate the presence of *bla* OXA-51-like genes in all 15 (100%) A. baumannii clinical isolate close to Nadeema et al (10).

Nevertheless, similar findings were reported in countries other than Iraq, such as Bulgaria, China, Brazil, Afghanistan, Korea (9), Singapore and Thailand (11). A study carried out by Hujer et al. demonstrated that 97% of A. baumannii strains (isolated from military and civilian personnelinjured in the Iraq/Kuwait region during Operations in Iraq have *bla* OXA-69-like gene (a member of *bla* OXA-51-like genes). The *bla* OXA-23-like genes present in 91.03% of IRAB which indicated its responsibility for the dominant carbapenem resistance gene in the local A. baumannii isolates.

In conclusion, this study identifies the gene responsible for the carbapenem resistance in Ramadi which is important to understand the carbapenem resistance and to suggest plans for treatment of patients in future. The high distribution of *bla* OXA-51-encoding genes presents an emerging threat in our hospital. The diversity of resistance genes is particularly worrisome due to the difficult choice of empirical antibiotic therapy in seriously ill patients and the possible contribution to increased hospital stay and associated costs.
Figure 1 : PCR amplification fragments for the detection of bla OXA-51 gene (553 bp) carbapenem-resistant \textit{Acinetobacter baumannii} strains. Lanes 1 – 15: = \textit{A. baumannii} Lane M: 100-bp DNA ladder. Amplicons were electrophoresed on agarose gel (1\%) at 70 V/cm for 1.5 h, stained with RedSafe(iNtRON, Korea), and visualized using an UV transilluminator documentation system.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding

**References**


Correlation between Serum Interleukin-33 Level and Uterine Fibroids

Farah Mahdi Hamza1, Nadia Mudher Al-Hilli2, Ameer KadhimAl-Humairi2

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2Ass. Prof., Babylon University, College of Medicine, Iraq

Abstract

Introduction: Fibroid is considered the most common benign tumor of the female genital system; it has vague incidence and etiology. IL33 is thought to play a role in pathogenesis and this may open the doors to further understanding and treatment of this disease.

Aim of the study: To assess if there is any correlation between IL33 serum level and uterine fibroid and if there is correlation with tumor features such as size, site and number.

Method: We take 40 women with leiomyoma and 40 leiomyoma free women at this case control study. For both of them history and physical examination was done with diagnosis supported by US, serum is collected and IL33 level was compared between both groups.

Results: Mean age of patients is 36 years most of them are married, over-weight, para 1-3 and has history of breast-feeding. Commonest presentation is HMB about 80% the least is dyspareunia, 36.8% had history of infertility, the majority of fibroids were intramural & multiple. There was higher IL33 levels among cases.

Conclusion: there is significant correlation between IL33 serum levels and presence of uterine leiomyoma and there was significant correlation with size of fibroid while there was no correlation with the site and number of fibroid.

Keywords: Tumor; Correlation, serum interleukin-33, uterine fibroids.

Introduction

Uterine fibroids are considered an important reason of morbidity in reproductive age women and sometimes even after menopause. Many causes have been attributed to the development of these tumors, but the etiology is unknown yet. They represent the most common benign tumor of the female genital tract. Uterine leiomyoma’s are defined as a hormone responsive tumors arise from myometrium smooth muscle cells usually by neoplastic transformation of a single smooth muscle cell (monoclonal origin)1. UFs can be single or multiple but mostly multiple. Uterine fibroid is usually considered a slowly growing tumor2. Fibroids sometimes can reach to a very large size up to 30 cm3 3. Most of women with UFs are asymptomatic and undiagnosed therefore, the true incidence is underestimated. Epidemiologic data are still limited, which mainly include incidence, prevalence, risk factors, natural history & disease progression. Uterine fibroids have been considered as the most important indication for hysterectomy in the United States 4. By age of 50, fibroid incidence is estimated to be approximately 70% for whites, and over 80% for blacks; Sweden women show much lower prevalence 5. Hispanics are parallel to whites than blacks 6. While Asian women or other ethnic groups has no available screening data. Prevalence of fibroids ranges between 3.3 and 77% 5. In the United States, the financial burden of UFs is estimated to be about $5.9 billion and $34.4 billion annually 7. The incidence of change to malignant leiomyosarcoma is 0.64 per 100 000 women per year and is very uncommon in women under the age of 40 8.

Method

This is a case control study performed at department
of obstetrics and gynecology at Babylon teaching hospital for Maternity and pediatrics in the period between January 2017 and December 2018. The study involves 80 non-pregnant women; their ages range from 20 to 50 years, forty of them had ultrasound evidence of fibroid and were presented to the hospital with symptoms related to fibroid such as menorrhagia, dysmenorrhea, abdominal distention and other symptoms of fibroid. Abdominal and endovaginal ultrasound involve details of fibroids, which include number, size, and site of fibroids are all measured. The second group (40 women) were healthy women (control group) who were leiomyoma free which was confirmed by ultrasound. For both groups history and physical examination is done according to a special questionnaire designed to predict risk factors, symptoms and signs. Exclusion criteria has been set during patient selection including women with the following diseases:

- Endometriosis.
- Different types of malignancy such as breast cancer, ovarian cancer, and others.
- Scleroderma.
- Liver and lung fibrosis.
- Autoimmune or inflammatory disease.
- Infectious disease as HIV and hepatitis.
- Pregnancy.

Ultrasound was done to all of the patients and control groups by a single radiologist Dr. H. F who has 9 years of experience. After confirming diagnosis by history, physical examination and ultrasound. 5 ml of blood was collected using gel tube then allowed to clot at room temperature for about 30 minutes, sample is then centrifuged for 5 minutes at 800g, and then samples stored at -20ºC until analysis. IL33 was measured in sera by (ELISA) using an ELISA KIT according to the manufacturers recommendations (Elabscience). Statistical analysis done by SPSS 22, frequency and percentages mean and SD for all data, Fisher’s-exact test were usefor association between categorical variables, Independent t-test was used to match different for continuous data, 0.05 or less for P-value reflected as significant.

Results

Uterine fibroids represent the most common female genital tract benign tumor, it is a hormone responsive tumor; however, the exact mechanism of this disease is still unknown, and will open the doors of the future to treat this disease thus reducing the morbidity costs associated with it. Regarding the age, in this study, the patients under study are ranging from 23-50 years with a mean age of (36.92 ± 7.64), the mean age of the control group was32±7years, there was significant differences of age between cases and control group. As shown in table(1). 95% of them are married (38 women) and 5% of them are unmarred (2 women only),12 of them are of Normal BMI (18.5-24.9kg/m2) which represent 30% of patients, overweight women (BMI 25-29.9kg/m2) were 16 women (40%), while Obese women (BMI 30 or more) also were 12 (30% of patients), 2 of them (5.3%) were nulliparous apart from 2 unmarried women, 22 of them (57.9%) were para1-3, 14 of them (36.8%) were para 4 or more. 28 of them(73.7%) had history of breast feeding, 10 of patients had no history of breast feeding(26.3%), regarding abortion, 15 patient had previous abortion(39.5%) while 23 of the patients had no previous abortion (60.5%), four of them had recurrent abortion, while others had single abortion. (as shown in table 2) Clinically the following clinical manifestations are studied these include intermenstrual bleeding, heavy menstrual bleeding, abdominal pain, abdominal mass, urinary symptoms, dyspareunia and dysmenorrhea, regarding the distribution of patients according to clinical manifestations there were 22 patients had IMB which represent 55% of patients, the reminder (18 patients) had no IMB which represent 45% of the patients. there were 32 patients had HMB which represent 80% of patients, the reminder (8 patients) had no HMB which represent 20% of the patients. 27 of patients has history of abdominal pain which represent 67.5% and 13 patients had no history of abdominal pain which represent 32.5%. 12 of patients had abdominal mass by history and examination which represent 30% while 28 of patients had no abdominal mass by history and examination which represent 70%, 13 of patients had history of urinary symptoms such as frequency and urgency which represent 32.5% of patients while 27 of patients had no history of urinary symptoms which represent 67.5% of patients, 5 of the patients had history of dyspareunia which represent 12.5% while 35 of the patients had no history of dyspareunia which represent 87.5% of the patients,23 of the patients had history of dysmenorrhea which represent 57.5% while 17 of patients had no history of dysmenorrhea which represent 42.5% of the patients. (as shown in table 3). Regarding the distribution of patients according to the size, site and number of uterine fibroids 37 of the patients...
had intramural fibroids which represent 92.5% of the patients while 3 of the patients had sub serosal fibroids which represent 7.5% of the patients, 67.5% of the fibroids were multiple (n=27) while only 32.5% of the fibroids were single (n=13) (as shown in table 3). In our study, there were significant differences of age between patients with uterine fibroid and control group as in table (3). Regarding the distribution of patients according to history of infertility 14 patients had history of infertility (36.8) while 24 patients had no history of infertility (63.2) (as shown in figure 1). There was significant differences between means of IL33 (pg/ml) between patients with uterine fibroids and control group (as shown in figure 2). There was no significant association between IL33 and number and site of fibroids as demonstrated in table 4. Regarding distribution of patients with uterine fibroids according to the size there was 5% less than 40mm$^3$, 27.5% between 40-80mm$^3$ and the majority was more than 80mm$^3$

### Table 1: The mean differences of age according to study group

<table>
<thead>
<tr>
<th>Study variable</th>
<th>Study group</th>
<th>N</th>
<th>Mean ± SD</th>
<th>t-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>Patients with uterine fibroid</td>
<td>40</td>
<td>36.92 ± 7.64</td>
<td>2.897</td>
<td>0.005*</td>
</tr>
<tr>
<td></td>
<td>Control group</td>
<td>40</td>
<td>32.10 ± 7.24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p value ≤ 0.05 was significant.

### Table 2: The Distribution of patients according to study variables

<table>
<thead>
<tr>
<th>Marital status</th>
<th>(36.92 ± 7.64)</th>
<th>(23-50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>38</td>
<td>95.0%</td>
</tr>
<tr>
<td>Single</td>
<td>2</td>
<td>5.0%</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100.0%</td>
</tr>
<tr>
<td>Body mass index (kg/m$^2$)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal (18.5-24.9)</td>
<td>12</td>
<td>30.0%</td>
</tr>
<tr>
<td>Overweight (25-29.9)</td>
<td>16</td>
<td>40.0%</td>
</tr>
<tr>
<td>Obese (30 or more)</td>
<td>12</td>
<td>30.0%</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100.0%</td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nulliparous</td>
<td>2</td>
<td>5.3%</td>
</tr>
<tr>
<td>(1-3)</td>
<td>22</td>
<td>57.9%</td>
</tr>
<tr>
<td>4 or more</td>
<td>14</td>
<td>36.8%</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>100.0%</td>
</tr>
<tr>
<td>Breast feeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>28</td>
<td>73.7%</td>
</tr>
<tr>
<td>No</td>
<td>10</td>
<td>26.3%</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>100.0%</td>
</tr>
<tr>
<td>Abortion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>15</td>
<td>39.5%</td>
</tr>
<tr>
<td>Absent</td>
<td>23</td>
<td>60.5%</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>100.0%</td>
</tr>
<tr>
<td>History of recurrent abortion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4</td>
<td>10.5%</td>
</tr>
<tr>
<td>No</td>
<td>34</td>
<td>89.5%</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

® Regarding parity, breast feeding and abortion (N=38) because two patients were single
Table 3: The Distribution of patients according to size, site and number of uterine fibroid

<table>
<thead>
<tr>
<th>Study variables</th>
<th>Size of uterine fibroid (mm³)</th>
<th>(107.26 ± 44.19)</th>
<th>(33-190)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size of uterine fibroid</td>
<td>Intramural</td>
<td>37</td>
<td>92.5%</td>
</tr>
<tr>
<td></td>
<td>Subserosal</td>
<td>3</td>
<td>7.5%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>40</td>
<td>100.0%</td>
</tr>
<tr>
<td>Number of uterine fibroid</td>
<td>Single</td>
<td>13</td>
<td>32.5%</td>
</tr>
<tr>
<td></td>
<td>Multiple</td>
<td>27</td>
<td>67.5%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>40</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 4: The mean differences of IL-33 according to site, number and size of uterine fibroid

<table>
<thead>
<tr>
<th>Study variable</th>
<th>Site</th>
<th>N</th>
<th>Mean ± SD</th>
<th>t-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IL-33 (pg/ml)</td>
<td>Intramural</td>
<td>37</td>
<td>33.80</td>
<td>11.00</td>
<td>0.185</td>
</tr>
<tr>
<td></td>
<td>Subserosal</td>
<td>3</td>
<td>32.56</td>
<td>13.58</td>
<td></td>
</tr>
<tr>
<td>Study variable</td>
<td>Number</td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>t-test</td>
</tr>
<tr>
<td>IL-33 (pg/ml)</td>
<td>Single</td>
<td>13</td>
<td>30.47</td>
<td>7.34</td>
<td>-1.302</td>
</tr>
<tr>
<td></td>
<td>Multiple</td>
<td>27</td>
<td>35.27</td>
<td>12.21</td>
<td></td>
</tr>
<tr>
<td>Study variable</td>
<td>Size</td>
<td>N</td>
<td>Mean</td>
<td>SD</td>
<td>t-test</td>
</tr>
<tr>
<td>IL-33 (pg/ml)</td>
<td>Below 80</td>
<td>13</td>
<td>24.10</td>
<td>2.43</td>
<td>-6.66</td>
</tr>
<tr>
<td></td>
<td>80 or more</td>
<td>27</td>
<td>38.34</td>
<td>10.52</td>
<td></td>
</tr>
</tbody>
</table>

*p value ≤ 0.05 was significant.

Figure (1): Distribution of patients with uterine fibroid according to history of
Infertility:

Discussion

Uterine leiomyoma is the most common neoplasm-affecting women that can cause significant morbidity and may adversely affect fertility.

In our study the mean age of patients was 36.9±7.6 and there was significant difference between the ages of cases and control group while in the study of Barbosa et al 2012 who studied the prevalence of uterine fibroids on 624 women, the mean age was (39.62±12.58) which approximate the mean in our study, while Santulli et al 10 in his sample has a mean age of 33.2±3.8 and there was no significant differences of age between the study and control groups in contrast to our study. Ezeama et al 11 study found a mean age of 35.7, which agreed with our study.

In our study married women were 95% while in Barbosa et al 9 study married women were 66.2% which doesn’t agree with our study also Ezeama et al 11 study 2012 51.5% were married which also doesn’t agree with our study. Regarding BMI in our study normal BMI was 30%, overweight women were 40%, obese women were 30% while in Barbosa study, 59.5% were of normal BMI, 27.1% were overweight (BMI 25-29.9), 10.3% were obese (BMI 30 or more) and only 3.4% were underweight.

In our study nulliparous was 5.3%, para 1-3 was 57.9% and para 4 and more was 36.8% while nulliparous women at Barbosa et al 9 study 2012 was 35.7% and Ezeama 11 study at 2012 nulliparous women were 77.7% which doesn’t agree with our study.

In our study 10.5% had history of recurrent miscarriage and 89.5% had no history of recurrent miscarriage which agree with Barbosa study has 53.5% of the sample with no history of miscarriage and 14.7% has history of miscarriage.

Regarding infertility in our study 36.8% had history of infertility whether primary or secondary and 63.2% had no history of infertility, which doesn’t agree with Barbosa study infertile women were, only 5% the other 95% were fertile.

There was no significant association between parity and uterine fibroids; there was no significant association with history of breast feeding, abortion or recurrent abortion. Only there was significant association with history of infertility whether primary or secondary.
Regarding clinical manifestation in our study the most common presenting symptom is heavy menstrual bleeding, followed by abdominal pain then dysmenorrhea, the least common symptom is dyspareunia which was only 12.5% of the patients. Ezeama et al\textsuperscript{11} found that the most common presentation is lower abdominal mass which represent 67.7% of his sample and the least one is recurrent abortion only 1%. In Ezeama et al\textsuperscript{11} study irregular vaginal bleeding was 9.7% while in our study 55%, Ezeama et al\textsuperscript{11} study found that HMB was present in 41.71% while in our study was 80%, Ezeama et al\textsuperscript{11} found that abdominal pain was present in 20.4% while in our study was present in 67.5%, Ezeama et al found that urinary symptoms was present in 8.7% while in our study urinary symptoms was present in 32.5%, Ezeama et al\textsuperscript{11} found that dysmenorrhea was present in 15.5% while in our study was present in 57.5%, lastly Ezeama et al\textsuperscript{11} found that infertility was present in 30.1 while in our study was present in 36.8%. while Barbosa\textsuperscript{9} has the following sequence of distribution of patients according to clinical manifestations, 18% of women presented with menstrual disorders such as dysmenorrhea, menorrhagia and metrorrhagia, dyspareunia was 1.1%, urinary symptoms was 1.4% and finally abdominal pain was present in 9.8% of the patients.

Regarding site of uterine fibroids we found in our study that 92.5% are intramural only the remainder were subserosal while Ezeama et al\textsuperscript{11} found that the majority were multiple 56.35% while 31% of the patients has intramural fibroids only, 5.8% has subserosal fibroids only, 7.8% has submucous fibroids only and there was a single case of intraligamentary fibroids, while, Barbosa found that 49.7% were single and 41.6% were multiple, Ezeama et al\textsuperscript{11} study 2012 found that 43.7% was single and 56.3% was multiple while in our study 67.5% was multiple and the reminder was single(32.5%) which is agreed with our study.

In this study we found a significant higher serum level of interleukin 33 in cases than controls which agreed with Santulliet al\textsuperscript{10} 2013 (the only available study) who found also that IL33 levels were higher in cases than in control.

We study the correlation of IL 33 with fibroid size, site and number. There was a positive correlation between size of fibroid & IL33 serum level, while no correlation was found between IL33 level and fibroid site and number.

**Conclusion**

There is significant correlation between IL33 serum levels and presence of uterine leiomyoma and there was significant correlation with size of fibroid while there was no correlation with the site and number of fibroid.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding

**References**


The Role of Foley Catheter in the Treatment of Low Grades Vesico-Ureteric Reflux (VUR)

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Abstract

Vesicoureteral reflux can be defined as a congenital anomalies of the lower urinary tract characterize by a defect in the vesico-ureteric valve (which is a functional valve result from the oblique intramural passage of the lower 2.5 cm. of the ureters in wall of the bladder) resulting in retrograde passage of urine into one or both ureters up to the kidneys during voiding. From March 2014 to June 2016, 60 (38 males and 22 females) children with low-grade primary VUR (10 with G1, 16 had G2 and 34 had G3) who are seeking medical advice in the urological department of Alhilla teaching and Alsadiq teaching hospitals and private clinics were included in this study. All patients evaluated by thorough medical history, complete physical examination, send for urinalysis, PCV, and ultrasonography, and confirm the diagnosis by voiding cystography. No Foley catheter put for patients with G1 VUR, while Foley catheter put for eight patients with G2 VUR (50%) and for 20 patients with G3 reflux (58.8%). Patients are fallowed for at least 1 year for any breakthrough upper or lower urinary tract infection and for the grade of reflux by frequent urinalysis and ultrasonography for any new renal scaring while voiding cystography repeat every 6 months. Conservative treatment is the first option in the treatment of low grade VUR. The use of indwelling Foley catheter in the treatment of low grade VUR remain controversy regarding its role in decreasing the back pressure on the renal parenchyma and its increasing rate of UTI. however this study reveal that the incidence of UTI occur in 6.25% of cases treated with continuous prophylactic antibiotic (CPA) alone and occur in 25% of cases treated with CPA with Foley catheter placement.

Keywords: Foley catheter, low grades, vesico-ureteric reflux (VUR).

Introduction

Vesicoureteric reflux can be defined as a congenital anomalies of the lower urinary tract characterize by a defect in the vesico-ureteric valve (which is a functional valve result from the oblique intramural passage of the lower 2.5 cm. of the ureters in wall of the bladder) resulting in retrograde passage of urine into one or both ureters up to the kidneys during voiding. The definite diagnosis and grading is best done by voiding cysotourethrogram (VCU) which can classify the condition into five grades.

The low grades VUR includes grade ¹,²,³. The treatment options for children with low grade VUR remain controversy regarding the use of long-term prophylactic antibiotic and the use of indwelling Foley catheter.⁸ Early diagnosis and use appropriate method of treatment for children with VUR increase the opportunity to prevent renal damage.³,⁹ Urinary tract infection in children with VUR increase the risk of pyelonephritis, which associated with renal scaring and damage.⁸ Many of the interventional clinical trials (controlled and randomized) which try to investigate the causal association between VUR and the frequency of febrile UTI and renal scaring are recently proved.¹⁰,AUA Guideline for Pediatric VUR establish the correlation between VUR and the frequency of febrile UTI and renal scaring in 1997.⁴,⁵,⁶ AUA Guideline state that renal scarring in children with VUR and pyelonephritis are 2.8 times greater than
the odds of scarring for children with pyelonephritis without VUR. So treatment of VUR is considered to reduce the morbidity of acute pyelonephritis and the risk of permanent renal injury, observation, continuous antibiotic prophylaxis, continuous bladder drainage by Foley catheter and surgical interventions are the main options used for treatment of children with VUR. Most of the studies which try to compare the outcomes of continuous prophylactic antibiotics versus surveillance alone in treatment of children with VUR regarding the renal scarring and damage state that renal scarring and damage occur less in children with reflux who are treated with continuous prophylactic antibiotics than those who are treated with antibiotics only when urinary tract infection occur. While other studies deny any benefit from the use of CPA over surveillance in decreasing the risk of recurrence of UTI and renal scarring. Although American Urology Association guideline in 2010 recommend that CPA is indicated during the waiting period in the conservative treatment.

Patients and Method

From March 2014 to June 2016, 60 (38 males and 22 females) children with low grade primary VUR (10 with G1, 16 had G2 and 34 had G3) who are seeking medical advice in the urological department of Alhilla teaching and Alsadiq teaching hospitals and private clinics were included in this study. Age of the patients ranging from 7 days to 6 years. All patients evaluated by thorough medical history, complete physical examination, send for urinalysis, p.c.v., and ultrasonography, and confirm the diagnosis by voiding cystography. Children with high-grade reflux and those with secondary reflux excluded from the study. Those children treated by conservative treatment, which include prophylactic antibiotics with or without Foley catheter placement. No Foley catheter put for patients with G1 VUR, while Foley catheter put for 8 patients with G2 VUR (50%) and for 20 patients with G3 reflux (58.8%). Patients followed for at least 1 year for any breakthrough upper or lower urinary tract infection and for the grade of reflux by frequent urinalysis and ultrasonography for any new renal scaring while voiding cystography repeat every 6 months. Data was collected and analyses by meta analyses with P-value of >0.05 is considered significant and of > 0.001 is considered highly significant.

Results and Discussion

1. VUR and SEX distribution: In this study, the male to female ratio is (1.7:1) as in Table 1 which seems to be near the results of most studies.

Table 1. Male to female ratio of VUR

<table>
<thead>
<tr>
<th>Gender</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>38</td>
<td>63.3</td>
</tr>
<tr>
<td>Female</td>
<td>22</td>
<td>36.7</td>
</tr>
</tbody>
</table>

2. The severity of VUR according to the grading: For 60 children with primary VUR who are included in the study, 10 children (16.6%) had grade 1 reflux while 16 children (26.7%) had grade 2 VUR and 34 children (56.6%) with grade 3 reflux this percentages can be presented in figure 1:

![Figure 1](image1.png)

Figure 1. Distribution of patients according to the grade of VUR
3. **The relation between VUR and UTI episodes:** For the 32 patients who are treated with prophylactic antibiotics alone without catheter placement only 2 patients had breakthrough febrile UTI (6.25%) and those 2 patients had grade 3 VUR.

For the 28 patients who are treated with prophylactic antibiotics with indwelling Foley catheter replaced every 10 days, 7 children had breakthrough febrile UTI (25%) 4 of them had grade 3 VUR and the remaining 3 children with grade 2 VUR. As showed in figure (2).

![Figure (2): The relation between the use of Foley catheter and the occurrence of UTI:](image)

4. **The relation between VUR and renal scaring:**

Renal scaring assessed by ultrasonography and for the 32 patients who are treated with prophylactic antibiotic alone, 8 of them (25%) develop new renal scars.

While for the group who treated with prophylactic antibiotics and indwelling Foley catheter, 7 out of 28 children (25%) develop new renal scars as appear in table (2).

![Table (2): The relation between Foley catheter placement and occurrence of renal scaring](image)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>scar</th>
<th>no scar</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Foley catheter placement</td>
<td>Count</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>% within UTI</td>
<td>50.0%</td>
<td>45.5%</td>
<td>46.7%</td>
</tr>
<tr>
<td>without Foley</td>
<td>Count</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td>% within UTI</td>
<td>50.0%</td>
<td>54.5%</td>
<td>53.3%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>16</td>
<td>44</td>
</tr>
<tr>
<td>% within UTI</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Fisher’s Exact Test= 0.097, P-value= 0.78 (not significant).
5. Rate of resolution and/or improvement in the grade of VUR: All the 10 patient with primary VUR of grade 1, six patients (60%) has complete resolution of the reflux with in the period of follow up (about 1 year).

While of the 16 patients who had grade 2 reflux, 8 patient who treated with CPA alone, no one had complete resolution for the follow up period and only 2 patient had improvement in the grade (change to grade 1) which account 25%. While those treated, with CPA and indwelling foley catheter 2 patient had complete resolution and other 3 patients change to grade during the follow up period so the improvement rate in this group is 62.5%.

Regarding the 38 patients with grade 3 reflux, 18 patients who treated with CPA alone, only 3 patients had improvement in the VCU and change to a lower grade (27%), while 8 patients (73%) of the 20 patients who treated with CPA with indwelling catheter had improvement in VCU. Patients with grade 2 71% of them improve with Foleys while 29% improved without Foleys. There is significant association between grade of VUR and improvement with Foleys catheter. These results showed in table (3).

Table (3): The relation between the Foley catheter placement and improvement in the grade of VUR:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Grade 1</th>
<th>Grade 2</th>
<th>Grade 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Improved</td>
<td>Total</td>
</tr>
<tr>
<td>With Foley catheter placement</td>
<td>Count</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>% improvement</td>
<td>0%</td>
<td>71%</td>
<td>73%</td>
</tr>
<tr>
<td>Without Foley</td>
<td>Count</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>% improvement</td>
<td>100%</td>
<td>29%</td>
<td>27%</td>
</tr>
<tr>
<td>Total improvement according to the grade</td>
<td>Count</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>% improvement</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Pearson Chi-Square = 9.457 DF = 2 P-value= 0.009 (significant).

Discussion

The male to female ratio differ with different studies and in different communities. In this study, the male to female ratio is about (1.7:1) and this male predominance may be due to the society preference of male gender makes the families who had male child seek medical advices even with mild symptoms which not fit for female patients who are usually present late and of high grades.

Regarding the grade of VUR at time of presentation, most cases included in this study are of grade 3 (56.6%) while those of grade 2 (26.7%) and of grade 1 (16.6%) this is because most cases of primary VUR diagnose postnatal when present as UTI and most studies reveal that the risk of UTI in VUR patients increase with increase the grade of reflux which mate the results of this study.

Although most previous studies reveal that UTI is commoner in VUR patients than those without VUR, this study also show that the percentage of UTI is higher in the group treated conservatively with CPA with indwelling foley catheter (25%) than the group treated with CPA alone (6.25%) although these results are statistically insignificant with p-value of 0.7 (>0.5) and this higher percentage mostly due to the effect of foley catheter which regard as a foreign body in the bladder and increase the risk of infection.

While the study did by Mattoo TK in 2011 relate the reflux nephropathy to the occurrence of upper UTI, in this study the rate of new renal scaring identified in primary VUR patients by ultrasonography seems to be statistically insignificant between the 2 groups as it occur in 50% of patients treated with CPA alone and also in 50% of VUR patients treated by CPA with indwelling foley catheter these results may be due to the effect of foley catheter while it increase the risk of UTI and in the same time decrease the back pressure on the kidneys by decreasing the degree of dilatation of the ureters and pelvescalyceal system and this decrease in the degree of
dilatation of the ureters and pelvicalyceal system which showed in table (3) explain why the group of patients who are treated with CPA and indwelling foley catheter had higher resolution and improvement rate than the group of patients who are treated with CPA alone which seems to be statistically significant and these results are mate the results of shiraishi and Knudson. 

**Conclusion**

Conservative treatment is the first option in the treatment of vesicoureteric reflux of low grades (grades 1, 2, 3). It included good hydration, good feeding with CPA. The use of indwelling Foley catheter remain controversy and this study show that the use of indwelling Foley catheter insignificantly increase the risk of UTI and renal scaring for cases of low grades VUR while it led to higher percentage of improvement in the degree of dilatation of the ureters and pelvicalyceal system which decrease the grade of reflux and may increase the spontaneous resolution rate. Although longer period of fallow up needed to know the exact effect of indwelling Foley catheter on the resolution rate of VUR.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding

**References**


Clinical Comparative Study for Some Biochemical Changes in Sera of Pregnant with Iron Deficiency Anemia

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Abstract

The aim of this study was to study the evaluation of serum oxidation in pregnant women with iron deficiency anemia by measuring lipid oxidation (MDA), and antioxidant status by analogy (Ferritin). Also, Examination of erythropoietin (EPO) levels in pregnancy with iron deficiency anemia. Blood samples were obtained from (80) pregnant women with anemia divided according to the stage of pregnancy and iron deficiency as follows: 20 patients in the second third with anemia without iron deficiency, 20 patients in the second third with anemia with iron deficiency, 20 patients in the third trimester with anemia without iron deficiency, 20 patients in the third trimester have anemia with iron deficiency. In addition to (40) healthy pregnant women as a control group. Divided into two groups, 20 patients in the second trimester and 20 patients in the third trimester.

Results: The results show a presence of a significant increase in MDA and EPO in all groups of patients in Iron deficiency in comparison with control group. But, Ferritin levels showed a significant decrease in all groups of patients in Iron deficiency and Iron normal comparison with control group.

Keyword: Erythropoietin, Malondialdehyde, Ferritin, Pregnancy, Iron deficiency anemia

Introduction

Anemia is one of the most important health problems in the world. Iron deficiency anemia is the most common form of nutritional deficiency that affects both developing and developed countries. An assessment by WHO directly or indirectly attributes approximately 591,000 perinatal deaths and 115,000 maternal deaths worldwide to iron deficiency anemia¹. The South Asian countries have the highest incidence of anemia in the world. Around half of the world’s maternal deaths from anemia occur in South Asian countries, and India accounts for around 80 per cent of the deaths². Anemia affects all age ranges from childhood to adolescence to perimenopausal age. The factors for the high incidence of anemia include low iron dietary consumption, reduced iron bioavailability, phytate-rich diet, bad eating habits, frequent menstrual blood loss and increasing proportion of infections such as malaria and roundworm infestations³. Due to increased demand from the increasing fetus, the condition gets exacerbated during pregnancy. Throughout pregnancy it is recommended that prophylactic oral iron meet the increased requirement during the antenatal phase. Compliance due to associated gastrointestinal side effects such as bloating, diarrhea, heartburn, nausea, constipation and dark stools is the main issue with oral iron therapy. So, too. Oral therapy does not suffice to treat moderate to serious anemia, especially in the late second and third trimesters. Parenteral therapy provides a stronger response in these patients and can reduce the need for antenatal and postpartum blood transfusions⁴. After iron supplementation, iron deficiency anemia occurs in several pregnant women as their iron stores need to support their own increased blood volume, as well as being a source of hemoglobin for the developing baby and for placental production⁵. The intravascular hemolysis and hemoglobinuria are other less common

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causes, pregnancy during Iron deficiency seems to cause long-term and permanent cognitive problems in the baby\(^6\). **Erythropoietin**, also known as EPO, is a glycoprotein hormone that controls the manufacturing of erythropoiesis, or red blood cells. It is a cytokine (protein signaling molecule) catalyst in the bone marrow for erythrocytes (red blood cells)\(^6\). The molecular weight of Human EPO is 34kDa. Also known as haematopoeitin or haemopoeitin, interstitial fibroblasts in the kidney are produced in close association with the capillary peritubular and proximal convoluted tubules. It is also formed in the liver, in perisinusoidal cells. While liver production predominates in both the fetal and perinatal periods, during adulthood renal production predominates. Other known biological functions include erythropoietin, in addition to erythropoiesis. This plays a major role in the brain’s reaction to neuronal damage, for example. The EPO also participates in the wound cure process\(^7\). The erythropoietin synthesis does not have a humoral or neural regulation. The development of erythropoietin is only dependent on the content of oxygen and is regulated by the feedback principle\(^8\).

**Malondialdehyde (MDA)** is one of the end products of peroxidation of polyunsaturated fatty acids in cells. An rise in free radicals causes MDA to become overproduced. Malondialdehyde is commonly referred to as a marker of oxidant stress in patients\(^9\).

**Ferritin**, a large iron storage protein, is essential to homeostasis of iron and participates in a wide variety of physiological and pathological processes. Ferritin is primarily used in clinical medicine as a serum measure of total body iron reserves. Serum ferritin plays a key role in both treatment and management in cases of iron deficiency and excess\(^10\).

**Design of study:** This study conducted at Women and Children Hospital in Al-Muthanna, Iraq, biochemistry laboratory at the period between 1/11/2019 and 1/4/2020. The study include (120) subjects, (80) patients with anemia (40 females second trimester divided to 20 anemia with Iron deficiency and 20 anemia non Iron deficiency, 40 female third trimester divided to 20 anemia with Iron deficiency and 20 anemia non Iron deficiency) with age range (18—40) years. While the control group, consists of (40) Healthy pregnant women divided to (20 females second trimester and 20 females third trimester).

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>80</td>
</tr>
<tr>
<td>Controls</td>
<td>40</td>
</tr>
</tbody>
</table>

**Collection of blood samples:** Blood samples are collected. About (5 mL) of blood samples of Pregnant women with anemia and controls are taken and allowed to clot at room temperature in empty disposable tubes and centrifuged to separate it at 3000 rotor per minute (rpm) for 10 min, the serum samples are separated and stored at (-20°C) for later measurement of biochemical parameters, unless used immediately.

**Statistical Analysis:** The statistical analysis used in this study is done using Microsoft Excel 2010, the results are expressed as mean ± standard deviations (mean ± SD) with LSD test. One way ANOVA-test is used to compare parameters in different studied groups. P-values (P ≤ 0.05) are considered statistically significant.

**Result and Discussion**

**Serume Erythropoieten concentration:** Table (2) show a significant increase in concentrations of serum EPO in patients pregnancy with anemia group in comparison with control group (P≤0.05). It was also found that there was a significant increase in 3rd groups compared to group 2nd groups, in addition to a significant increase was observed in 3rd D group compared to 3rd N, and there was also a significant increase in 2nd D group compared to 2nd N group these result agree with. Indeed, pregnancy anemia leads to increased secretion of the EPO as a response to low concentration of haemoglobin and ferritin deficiency\(^11\). The primary function of erythropoietin is an important hormone for the manufacture of red blood cells. No definitive erythropoiesis happens without it. Under hypoxic conditions, the kidney develops and secretes erythropoietin to improve red blood cell output\(^12\). Due to the physiological increase in blood volume, the increase in EPO levels is greater in the third trimester of pregnancy than in the second trimester of pregnancy. Increased renal blood flow and glomerular filtration by 30-50 percent, and since erythropoietin is of renal origin and increased oxygenation, the concentration of the EPO has been shown to increase 2-4 times\(^8\).
Table groups (2) serum EPO levels of control and 3d iron D,N and 2d iron D, N levels.

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>EPO (mlU/ml) Mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second Trimester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Control</td>
<td>20</td>
<td>84.67±14.21d</td>
</tr>
<tr>
<td>2nd N</td>
<td>20</td>
<td>121.82±34.66c</td>
</tr>
<tr>
<td>2nd D</td>
<td>20</td>
<td>173.38±52.98b</td>
</tr>
<tr>
<td>Third Trimester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd Control</td>
<td>20</td>
<td>92.84±20.98d</td>
</tr>
<tr>
<td>3rd N</td>
<td>20</td>
<td>135.76±41.45c</td>
</tr>
<tr>
<td>3rd D</td>
<td>20</td>
<td>217.70±72.82a</td>
</tr>
<tr>
<td>L.S.D</td>
<td></td>
<td>24.19</td>
</tr>
</tbody>
</table>

N: Number of subjects.
SD: Standard deviation.
LSD: Least Significant Difference.
2nd Control: Second Trimester Control.
2nd D: Second Trimester Iron Deficiency.
3rd Control: Third Trimester Control.
3rd N: Third Trimester Iron Normal.
3rd D: Third Trimester Iron Deficiency.

Serum Malondialdehyde Concentration: Table (3) show a significant increase in concentrations of serum MDA in patients pregnancy with anemia group in comparison with control group (P≤0.05). It was also found that there was a significant increase in 3d iron groups compared to group 2nd groups, in addition to a significant increase was observed in 3rd D group compared to 3rd N, and there was also a significant increase in 2nd D group compared to 2nd N these result agree with. Anemia is known to promote oxidative stress due to insufficient supply of tissue oxygen resulting in increased free radical development and very low levels of circulating red blood cells and mobile free radical scavengers that protect tissues from ROS-mediated harm(13). The increase in serum and erythrocyte fatty oxidation in pregnant women Particularly during the third trimester of pregnancy, the production of pregnancy-related oxidative therapy is obvious in pregnant women. Thus pregnancy is a physiological condition characterized by an oxidative disorder which contributes to the initiation and progression of complications related to pregnancy(14). The body's iron deficiency limits heme synthesis and reduces the production of red blood cells in the marrow that leads to anemia. Because energy Cellular metabolism is oxygen dependent, anemia has a wide range of clinical consequences. Anemia results in increased oxidative stress and increased peroxide in lipids. Can not exclude iron deficiency as an person with a normal body iron will coagulate a large portion of body iron before hemoglobin levels decrease The enzymes used in the cycle of oxidative metabolism need iron to be less than the laboratory meaning of anemia. At the same moment, This should be taken into account that iron iron is used to treat iron by mouth during pregnancy as a drug Strong oxidation and several studies have shown that iron-deficient people are more prone to this treatment than iron therapy-induced oxidative stresses. The concentration of malondialdehyde (MDA) in pregnant women with iron deficiency anaemia is higher in this study(15).

Table groups (3) serum MDA levels of control and 3d iron D,N and 2d iron D,N levels.

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>MDA(umol/L) Mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second Trimester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Control</td>
<td>20</td>
<td>2.23 ± 0.59d</td>
</tr>
<tr>
<td>2nd N</td>
<td>20</td>
<td>2.48 ± 0.57d</td>
</tr>
<tr>
<td>2nd D</td>
<td>20</td>
<td>3.12 ± 0.95a</td>
</tr>
<tr>
<td>Third Trimester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd Control</td>
<td>20</td>
<td>2.56 ± 0.43d</td>
</tr>
<tr>
<td>3rd N</td>
<td>20</td>
<td>4.01 ± 0.94b</td>
</tr>
<tr>
<td>3rd D</td>
<td>20</td>
<td>5.10 ± 1.45a</td>
</tr>
<tr>
<td>L.S.D</td>
<td></td>
<td>0.45</td>
</tr>
</tbody>
</table>

Serum Ferritin concentrations: Table (4) show a significant decrease in concentrations of serum ferritin in patients pregnancy with anemia group in comparison with control group (P≤0.05). It was also found that there was a significant increase in 3rdgroups compared to group 2nd groups, in addition to a significant decrease was observed in 3rdD group compared to 3rdN, and there was also a significant decrease in 2ndD group compared to 2ndN group these result agree with. Although concentrations of haemoglobin and ferritin are both iron deficiency markers, haemoglobin is a late marker, and may not reflect the status of tissue iron. In general, however, serum ferritin (SR) is considered the best measure of iron deficiency during pregnancy. The level falls early of iron deficiency and is not impaired by the recent ingestion of iron(16). A study of 100 women in the second and third trimester of pregnancy and anemia was shown as follows, iron deficiency anemia (Hb ≤10.5 g/dl; ferritin ≤12 ng/ml). Anemia not due to iron deficiency (Hb ≤10.5 g/dl; ferritin> 12 ng/ml)(17).
Table groups (4) serum Ferritin levels of control and 3d iron D,N and 2d Iron D,N levels.

<table>
<thead>
<tr>
<th>Groups</th>
<th>No</th>
<th>SR(ng/ml) Mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Second Trimester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Control</td>
<td>20</td>
<td>25.36 ± 7.97&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>2nd N</td>
<td>20</td>
<td>16.61 ± 4.84&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>2nd D</td>
<td>20</td>
<td>7.96 ± 2.33&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Third Trimester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd Control</td>
<td>20</td>
<td>25.66 ± 6.60&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>3rd N</td>
<td>20</td>
<td>18.59 ± 6.33&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>3rd D</td>
<td>20</td>
<td>8.30 ± 2.50&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>L.S.D</td>
<td></td>
<td>2.80</td>
</tr>
</tbody>
</table>

**Conclusion**

1. The levels of the hormone erythropoietin are higher in women with anemia and it increases more in women with anemia with iron deficiency.

2. The levels of lipid peroxide (MDA) markers were elevated in pregnant women with iron deficiency anemia and also elevated in pregnant women with anemia without iron deficiency.

3. Fritin levels are in iron deficiency groups below of iron normal groups.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**Funding:** Self-funding

**References**


Status of HIV/AIDS Over Ten Years in Iraq (2010-2019)

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Abstract

Despite advances, HIV/AIDS remains one of the world’s most significant health and socio-economic problems. To highlight the status situation of the HIV/AIDS in Iraq for the last ten years (2010-2019). A retrospective study of available data on new HIV cases records covering the period from 2010 to 2019. This study was conducted in Iraq from July 2018 to December 2019. We collected these data from HIV/AIDS Center in Baghdad. All the cases are diagnosed through case history, clinical examination and laboratory investigations. The cumulative annual number of new HIV cases covering the period from 2010 to 2019 was 539 cases. The trend of annual number of the cases increased with time (2010-2019). All cases are adults. The majority of new HIV cases are males (83.5%) and alive (90.2%). Sexual activity contributed the main mode of HIV transmission (74.6%) especially heterosexuals.

Keywords: HIV/AIDS, Toxicity; Status, Trend, Iraq.

Introduction

Despite advances, HIV/AIDS remains one of the world’s most significant health and socio-economic problems, particularly in low and middle-income countries including Iraq.[1]

WHO estimated that in 2018, there were about thirty eight million people living with HIV in the world. Of these two millions new HIV infections, one million AIDS-related deaths, twenty three million people were accessing antiretroviral therapy (ART), there were 36 million adults (18 million women and 16 million men) and 2 million children. Globally, in 2018, new HIV infections have been reduced by 16% since 2010 and HIV-related deaths decreased by 45% due to ART and the great efforts of national HIV/AIDS programme.[2-4] In 2014, the United Nations on HIV/AIDS (UNAIDS) declared for achieving “95-95-95” targets for ending HIV/AIDS epidemic at the end of 2030.[5-6]

In Middle East region, although the overall HIV prevalence is still low (<0.1%), but increasing in the annual number of newly identified HIV cases by 28% from 2010-2018, put this region at the top among the different regions of WHO in growing of HIV epidemic and this may be attributed to variation of socio-economic and health system.[1,7-8]

Since the detection of the first case of HIV in 1980s, Iraq is considered a country with a low HIV prevalence in general population (<0.1%) and of a low epidemic level of HIV/AIDS. In 2014, WHO and MOH/Iraq declared that our country will be free from the illness (zero) when new HIV cases were identified in 2012.[9-10] but with time we noticed many new HIV cases were detected which not correspond to the efforts of the MOH in co-ordination and corporation with WHO.

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All data regarding HIV/AIDS are under strict of governmental restriction. There is no published research studying the epidemiology of HIV/AIDS in Iraq except one covering the period from 1986-2005. However, epidemiologic data are essential to plan intervention strategies and make them more successful. Therefore such data are needed to highlight the general epidemiological status and trend of the newly identified HIV/AIDS cases in Iraq for the last ten years (2010-2019).

**Materials and Method**

A retrospective study of available data on newly identified Iraqi HIV cases records covering the period from 2010-2019. This study was conducted in Iraq from the period of July 2018 to December 2019. An annual number of newly identified HIV cases had been registered at the Iraqi National AIDS Program Center (INAPC) for the last ten years (2010-2019). All cases were identified according to WHO Case definition of HIV infections through comprehensive medical history, physical examination and laboratory investigations including virologic and serologic testing represented by anti-HIV antibodies which is essential to support the clinical assessment in identification of HIV. Physical examination was used as a tool for classifying the different stages of HIV infections into asymptomatic, mild symptoms, advanced and severe symptoms.

Testing for HIV infection is available in all governmental and non-governmental hospitals and certainty private clinics and labs. HIV infection was diagnosed initially by using ELISA test as screening test, if the test is positive twice time, it should be send to Western blot for confirmation, if it is also positive, it should be send for Polymerase Chain Reaction (PCR) for viral load. Flow-cytometry CD4 count is used to complete follow up of the cases with ART which is free of charge, but it is not available in some Iraqi governorates, and then follow up is recommended by PCR every six months. All these tests are available in Central Health Laboratory in Baghdad/Iraq and also free of charge. All confirmed positive cases are registered and notified to governmental health authorities and through regional HIV/AIDS coordinators to the National HIV/AIDS Program Center.

Data collection was obtained from the records of new HIV case including age, sex, occupation, residence and province, social behavior, educational level, socio-economic status, history of possible routes of HIV transmission regarding type of sexual activity, intravenous drug injection, frequent blood transfusions, surgeries, dental operations, history of prisons, nature of sexual partners, history of condom using and history of ART.

Identification of HIV infections is based on taking mandatory HIV testing for certain groups: suspected HIV patients, contacts of sero-positive persons, blood and organ donation, imprisonment, couples who are planning to marry before marriage, travelers, staff in certain occupations, voluntary testers, illegal drug users, as well as people who have been discovered accidentally when subjected to HIV testing before undergoing surgery or performing major dental operations.

Ethical approval and permission to conduct this work was obtained from Ethical Approval Committee of Al-Anbar University in 23/February/2018, NO.24.

Statistical analysis of available data was performed using Statistical Package for Social Sciences (SPSS) Version 22. For case description; frequencies and percentages were represented in the form of tables and figures. Significance of association between various epidemiological variables was assessed using Chi-square test or Yate’s Corrected test. A P-value ≤0.05 level of significance was used as the criterion for determining statistical significance.

**Results**

A total of 539 new HIV Iraqi cases were recorded at the INAPC during the period from 2010 to 2019, of which, 486 cases are alive and the rest were dead. Their ages ranged from 16-68 years with a mean age 36.8 years. The bulk of the new HIV cases are males (83.5%). There is significant difference between both sexes (P<0.0021) (Figure 1 and table 1).

The current results show increasing in the trend of annual number of new HIV Iraqi cases (total and alive) year by year from 2010 to 2019. The distribution of the cases was ten (1.8%) in 2010, 29 (5.4%) in 2015, reaching to 157 cases (29.1%) in 2019, giving an annual HIV infection growth rate of 14.7%. The difference in the distribution of annual number of new HIV cases was statistically significant (P<0.0001) (Table 1 and Figure 2).
The distribution of HIV cases has an upward trend among both sexes across the last ten years of diagnosis (Table 1). This difference was also statistically significant (P< 0.0021). Figure 2 shows the annual AIDS-related deaths in Iraq during the period 2010-2019. The trend of the annual number of HIV-related deaths has been static (stable) for the last ten years and the annual HIV-related deaths grow at an average of 5.3%.

Table (2) shows that sexuality represents the commonest route of HIV transmission among the new HIV Iraqi cases (74.6%). Blood donation and illegal drug using accounted for 5.2%, and 0.2%, respectively; while none specify accounted 20%, this difference was also of significance (P<0.0001). The bulk of the new HIV cases reported heterosexuals in 85.1%, while 12.2% and 2.7% of the cases reported bisexuals and homosexuals, respectively, with statistically of significant (P<0.0001). (Table 2).

Table 1: Distribution of annual number of new HIV Iraqi cases from 2010–2019 according to gender.

<table>
<thead>
<tr>
<th>Years of diagnosis</th>
<th>Gender</th>
<th>Total No. %</th>
<th>Male No. %</th>
<th>Total cases (539)</th>
<th>Female No. %</th>
<th>Total HIV cases (539)</th>
<th>Total No. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>Male</td>
<td>8</td>
<td>1.5</td>
<td>2</td>
<td>0.4</td>
<td>10</td>
<td>1.8</td>
</tr>
<tr>
<td>2011</td>
<td>Male</td>
<td>7</td>
<td>1.3</td>
<td>4</td>
<td>0.8</td>
<td>11</td>
<td>2.0</td>
</tr>
<tr>
<td>2012</td>
<td>Male</td>
<td>12</td>
<td>2.2</td>
<td>1</td>
<td>0.2</td>
<td>13</td>
<td>2.4</td>
</tr>
<tr>
<td>2013</td>
<td>Male</td>
<td>18</td>
<td>3.3</td>
<td>4</td>
<td>0.8</td>
<td>22</td>
<td>4.0</td>
</tr>
<tr>
<td>2014</td>
<td>Male</td>
<td>16</td>
<td>2.9</td>
<td>6</td>
<td>1.1</td>
<td>22</td>
<td>4.0</td>
</tr>
<tr>
<td>2015</td>
<td>Male</td>
<td>22</td>
<td>4.1</td>
<td>7</td>
<td>1.3</td>
<td>29</td>
<td>5.4</td>
</tr>
<tr>
<td>2016</td>
<td>Male</td>
<td>48</td>
<td>8.9</td>
<td>7</td>
<td>1.3</td>
<td>55</td>
<td>10.4</td>
</tr>
<tr>
<td>2017</td>
<td>Male</td>
<td>85</td>
<td>15.7</td>
<td>11</td>
<td>2.0</td>
<td>96</td>
<td>17.5</td>
</tr>
<tr>
<td>2018</td>
<td>Male</td>
<td>102</td>
<td>18.9</td>
<td>22</td>
<td>4.1</td>
<td>124</td>
<td>33.4</td>
</tr>
<tr>
<td>2019</td>
<td>Male</td>
<td>132</td>
<td>24.5</td>
<td>25</td>
<td>4.6</td>
<td>157</td>
<td>29.1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>450</td>
<td>83.5</td>
<td>89</td>
<td>16.5</td>
<td>539</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Test used: \[X^2 = 25.8693\] \[DF = 9\] \[P-value = 0.0021\]

Figure 1: Distribution of annual number of new HIV Iraqi cases from 2010 - 2019, according to gender.

Table 2: Distribution of annual number of new HIV Iraqi cases from 2010–2019 according to gender.

<table>
<thead>
<tr>
<th>Years of diagnosis</th>
<th>Gender</th>
<th>Total No. %</th>
<th>Male No. %</th>
<th>Total cases (539)</th>
<th>Female No. %</th>
<th>Total HIV cases (539)</th>
<th>Total No. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td>1.5</td>
<td>2</td>
<td>0.4</td>
<td>10</td>
<td>1.8</td>
</tr>
<tr>
<td>2011</td>
<td></td>
<td></td>
<td>1.3</td>
<td>4</td>
<td>0.8</td>
<td>11</td>
<td>2.0</td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td></td>
<td>2.2</td>
<td>1</td>
<td>0.2</td>
<td>13</td>
<td>2.4</td>
</tr>
<tr>
<td>2013</td>
<td></td>
<td></td>
<td>3.3</td>
<td>4</td>
<td>0.8</td>
<td>22</td>
<td>4.0</td>
</tr>
<tr>
<td>2014</td>
<td></td>
<td></td>
<td>2.9</td>
<td>6</td>
<td>1.1</td>
<td>22</td>
<td>4.0</td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td></td>
<td>4.1</td>
<td>7</td>
<td>1.3</td>
<td>29</td>
<td>5.4</td>
</tr>
<tr>
<td>2016</td>
<td></td>
<td></td>
<td>8.9</td>
<td>7</td>
<td>1.3</td>
<td>55</td>
<td>10.4</td>
</tr>
<tr>
<td>2017</td>
<td></td>
<td></td>
<td>15.7</td>
<td>11</td>
<td>2.0</td>
<td>96</td>
<td>17.5</td>
</tr>
<tr>
<td>2018</td>
<td></td>
<td></td>
<td>18.9</td>
<td>22</td>
<td>4.1</td>
<td>124</td>
<td>33.4</td>
</tr>
<tr>
<td>2019</td>
<td></td>
<td></td>
<td>24.5</td>
<td>25</td>
<td>4.6</td>
<td>157</td>
<td>29.1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>83.5</td>
<td>89</td>
<td>16.5</td>
<td>539</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Test used: \[X^2 = 471.482\] \[DF = 9\] \[P-value = 0.0001\]
Figure 2: Distribution of annual number of new HIV Iraqi cases (total, alive and AIDS-related deaths) from 2010-2019.

Table 2: Possible routes of HIV transmission among new HIV Iraqi cases from 2010-2019.

<table>
<thead>
<tr>
<th>Route of transmission</th>
<th>Total HIV cases (539) No. %</th>
<th>Test used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexual practice:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterosexual</td>
<td>402 74.6</td>
<td>$X^2 = 489.6864$, DF = 2, P-value = 0.0001</td>
</tr>
<tr>
<td>Bisexual</td>
<td>342 85.1</td>
<td></td>
</tr>
<tr>
<td>Homosexual</td>
<td>49 12.2</td>
<td></td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>28 5.2</td>
<td></td>
</tr>
<tr>
<td>Illegal drug injection</td>
<td>1 0.2</td>
<td></td>
</tr>
<tr>
<td>None specify</td>
<td>108 20.0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>539 100</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

Approximately, the Iraq population is 39,585,950 million, which ranks 36th in the world, with an annual population growth rate of >2%.[14] Iraq has previously been considered protective from HIV because of dominant conservative socio-cultural norms concerning behavior habits.[15]

In this study, a total number of new HIV Iraqi cases registered during the last ten years (2010-2019), is double than that reported in the same country from 1986 to 2005[11]. Thus, trend in the annual number of new HIV cases shows a progressive increasing with time and grew with an average rate of 14.7% per year. Our findings are consistent to other studies conducted in the MENA countries; meanwhile, globally, the rate was declined globally by 16% from 2010-2018.[16-19]

These findings indicate that HIV infection is endemic in Iraq and may lead to an epidemic if there is no implementation of proper and effective national plan on HIV infections. Our findings reflect a combination
of HIV patients seeking for ART which is free or from suspected HIV infection or through routinely HIV testing for certain groups and also reflects the effectiveness and activities in implementation of Iraqi National HIV/AIDS Program through performing more routinely HIV testing, counselling services; and could be the result of more acceptability and voluntary seeking of testing among Iraqi people; the more liberal life of Iraqi people after 2010 may participate in the increasing the risk of HIV transmission.

Fortunately, although the number of new HIV illness is increasing with time in Iraq, the prevalence of HIV infections still remains low (<0.1%), and incidence below 3/100,000. This may be related to the religious factor that plays directly on the socio-cultural behaviors of the people living in MENA countries. However, Iraq like other countries in the MENA region that despite of low HIV prevalence, it is considered of increasing concern.[7,16]

In the present study, sexual practices become responsible for the majority of the new HIV Iraqi cases (74.6%), largely through heterosexuals (85.1%), while blood donation was declined to 5.2%, when it was the main route of HIV transmission in the same country during the period from 1986 to 2005 (84.6%).[11] These results are consistent to others.[8,16,22] The introduction of blood screening for HBsAg and prohibition of drug abuse by public authorities in our country contributed for reducing the risk of HIV infections, but after 2010, increasing free liberal life, drug addicts and illegal sex outside the country through their travel, living abroad as refugees in many countries, all these factors collectively may increase risk of exposure to HIV.

There are some limitations in this study leading to underestimation of the true number of new HIV/AIDS cases in Iraq. Registration of data obtained in Iraq are mainly dependent on the activity of National HIV Center which depends on the Central Health Laboratory in Baghdad and other Iraqi governorates, while there are many new HIV cases diagnosed and treated outside this center and/or outside the country while they are living in Iraq. Available data on recorded new HIV cases obtained by routine surveillance does not represent the actual situation. Data collection obtained concerning sexual behavior and illegal drug injections as routes of HIV transmission are more sensitive issues, because of social stigma, so many cases reported none specify (unknown causes) which lead to information bias. There are many HIV cases not recorded because of social stigma and discrimination for both sexes but mainly for women. Another limitation is unavailability of flow cytometry CD4 count in some governorates due to the political instability especially after 2014, which acts as a barrier for studying viral load during ART courses.

**Conclusion**

Iraq still remains an area of low HIV prevalence although the trend of cumulative annual number of new HIV cases increased with time and this may lead to an epidemic/endemic. The trend of annual number of HIV-related deaths has been static for the last ten years. Most of the cases are alive and youth. The epidemiology of HIV illness has been changed with time, sexual behavior, and marital statuses are common among the HIV cases). More work is needed for HIV testing as passive and active HIV surveillance and preventive measures for the people especially the high risk groups.

**Acknowledgement:** The authors declare great thanks to the Iraqi MOH/Department of Public Health/ HIV Medical Center. Also to the College of Medicine/ University of AL-Anbar and Professor Faris Al-Lami Consultant of Public Health/College of Medicine/ Baghdad University for their help and cooperation to complete this article.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding

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Evaluation the Effect of *Blastocystis Hominis* to the Levels of Ghrelin, Growth Hormone and Lipoproteins in Sera of Patients with Gastrointestinal Manifestations in Baghdad

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¹Postgraduate, Department of Biology, College of Education, University of Samarra, Salah al-Din, Iraq, ²Assist. Prof. College of Applied Science, University of Samarra, Salah al-Din, Iraq

Abstract
Epidemiological study was conducted to investigate the prevalence of *Blastocystis hominis*, in Baghdad, Iraq, for the period from 1 July 2019 to 31 December 2019. The study included examination of 267 stool samples which collected from patients complained of gastrointestinal manifestations attended to Baghdad Teaching Hospital and Children Protection Teaching Hospital, in addition to examination of 30 blood samples for healthy individuals as a control group. It was found that 60 patients (22.5%) were infected with *Blastocystis hominis*. Also the study included the effect of this parasite on the levels of growth hormone (GH) and ghrelin, in addition to some biochemical parameters in the serum of the infected persons and the control group. These parameters included total serum protein (TSP), albumin, total cholesterol, triglycerides (TG), high-density lipoproteins-cholesterol (HDL-C), low-density lipoproteins-cholesterol (LDL-C), and very low-density lipoproteins (VLDL), and the results showed a significant decrease (P<0.05) in concentrations of ghrelin hormone, albumin, and HDL, while a significant increase (P<0.05) was observed in concentrations of growth hormone, total cholesterol, triglycerides, LDL-C, and VLDL.

Keywords: *Blastocystis hominis*, ghrelin, growth hormone, Lipoproteins.

Introduction
Diseases caused by intestinal parasites are one of the main public health problems around the world¹. *Blastocystis hominis* is considered as the commonest intestinal human protozoan in the world². It is an eukaryotic, single-celled, anaerobic parasite that living in the intestines of human and many animals³. Morphologically, *Blastocystis* is a highly polymorphic organism that takes several different forms during its life cycle including vacuolar, cystic, amoeboid, granular, multivacuolar, and avacuolar forms⁴, it is classified into the Stramenopiles group⁵. Prevalence rate of *B. hominis* infection in the developed countries ranging from 1.5 –10%, where as it is higher in the developing countries ranging from 30 – 60%⁶, and a recent study even showed a prevalence of 100% in a cohort of children living in a rural area of Senegal⁷. Since asymptomatic carriage by *B. hominis* is very common, its role in human health and disease remains uncertain⁸. Intensive molecular studies based on diversity within the nuclear small subunit (SSU) ribosomal RNA gene unveiled as many as 17 *Blastocystis* subtypes (STs), all of which look alike under the microscope⁹. Infection with *B. hominis* may lead to several gastrointestinal symptoms such as abdominal pain, diarrhea, nausea, vomiting, bloating, anorexia, or less commonly dermatological complaints such as urticaria and anal itching¹⁰. Intestinal parasitic infections including *B. hominis* can affect human ghrelin hormone¹¹. Ghrelin (Ghrelin Appetite Hormone) is a 28-aminoacid peptide, was discovered in the stomach as anendogenous ligand for the growth hormone Secretagogue receptor (GHS-R)¹².
Although many studies focused on the effect of intestinal parasitic infections on the growth status in human, growth hormone (GH) levels during intestinal parasitic infections have not been tested to date. Growth hormone is a peptide hormone that is secreted from the anterior pituitary, it has a central function in regulating postnatal growth and metabolism, in addition to exhibiting pleiotropic effects on various human tissues[13].

Intestinal parasitic infections have an effect on the biochemical parameters of the patients, including albumin[14], total cholesterol, triglycerides, HDL-C, LDL-C, and VLDL[11]. This study aimed to investigate the prevalence of Blastocystis hominis in Baghdad city, Iraq, and its effect on ghrelin and growth hormones in addition to some biochemical parameters in the infected patients.

Materials and Method

Study Design: A cross sectional study was performed from 1 July, 2019 to 31 of December, 2019. A total of 267 stool samples and the same number of blood samples were collected from patients complained of gastrointestinal upset, who attended to Baghdad Teaching Hospital and Children Protection Hospital. The samples collected from both sexes of different age groups (2−65 years). Information was taken from each patient based on a questionnaire form.

Microscope Examination: The collected stool samples have been brought and examined under direct microscopy after preparing double wet preparations of 0.85 % NaCl and 1% Lugol’s iodine.

Blood samples, hormonal and biochemical tests: The collected blood samples were placed in tubes containing gel and left to clot for 20 minute at room temperature and then transferred to the centrifuge (3000 rpm) for 5 minutes to obtain the serum. Serum of each patient was placed in three Ependorff tubes by using a pipette and kept in the refrigerator at (−20°C) to be used later for detection of serum levels of ghrelin and growth hormones, in addition to total serum protein (TSP), albumin, and lipid profile including total cholesterol, triglycerides (TG), HDL-C, LDL-C, and VLDL.

Statistical analysis: Results were analyzed statistically using analysis of variance test-ANOVA by using the statistical program Minitab. Averages were compared to calculations of the characteristics of the application Duncan’s Multiple Range Test by probability level P ≤ 0.05.

Results and Discussion

The current study showed that the Blastocystis hominis infection rate was 22.5%, the percentage of females infected was 56.7%, while for males was43.3%. The rate of infection in this study was consistent with many previous studies such as; 24.1% in Baghdad city, Iraq[15], and 22.15% in Al-Sulaimaniyah city, Iraq[16].

Table 1 shows the highest infection rate was with B. hominis only (single infection) by 65%, while the second group, which represented the mixed infections of B. hominis with other intestinal parasites, revealed that the highest rate was with the Entamoeba histolytica by 26.7%, while the lowest was with Giardia lamblia by 8.3%, with statistical significance (P<0.01).

Table 1: Rate of single and mixed infections with B. hominis and other intestinal parasites

<table>
<thead>
<tr>
<th>Parasite</th>
<th>Number of infected persons</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. hominis</td>
<td>39</td>
<td>65 %</td>
</tr>
<tr>
<td>B. hominis + E. histolytica</td>
<td>16</td>
<td>26.7 %</td>
</tr>
<tr>
<td>B. hominis + G. lamblia</td>
<td>5</td>
<td>8.3 %</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100 %</td>
</tr>
</tbody>
</table>

The results of this study are consistent with the result of previous studies in Samarra city, Iraq[17], Indonesia[18], and Egypt[19].

Hormonal Parameters: Table 2 shows the results of ghrelin and growth hormones (GH) for patient samples infected with Blastocystis hominis compared to the control group. The serum levels of ghrelin hormone were found to be significantly reduced in the patients compared with the control group, the results of this study are consistent with the results of studies in Turkey[11], and Spain, which showed that there is a decrease in serum ghrelin levels in patients complaining of Helicobacter pylori infection associated with intestinal parasitic infections including B. hominis[20].

The low levels of ghrelin in people with intestinal parasitic infections, including B. hominis, may be due to inflammation of the intestinal mucosa, affecting the hormone secretion process that mainly occurs in the stomach and small intestine[21].
Studies have not been yet examined the levels of serum growth hormone during the intestinal parasitic infections, despite that the current study recorded a significant increase in levels of growth hormone in the serum of the patients infected with *Blastocystis* in comparison with the control group. The increase in levels of growth hormone in these patients may be due to the stress condition caused by the inflammatory process in repose to *Blastocystis* infection, because this hormone is one of the stress hormones[22].

### Table 2: Hormonal parameters comparison between patients infected with *B. hominis* and control groups

<table>
<thead>
<tr>
<th>Hormonal Parameters</th>
<th>Mean ± S.D</th>
<th>Patients group</th>
<th>Control group</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ghrelin hormone</td>
<td>0.7 ± 0.576</td>
<td>1.683 ± 0.484</td>
<td>0.0004</td>
<td></td>
</tr>
<tr>
<td>Growth hormone</td>
<td>53.8 ± 10.6</td>
<td>22.65 ± 5.58</td>
<td>0.0007</td>
<td></td>
</tr>
</tbody>
</table>

**Biochemical parameters:** Table 3 shows the results of serum albumin and lipid profile including total cholesterol, triglycerides, HDL-C, LDL-C, and VLDL for patient samples infected with *Blastocystis hominis*. The serum albumin levels were found to be significantly reduced in these patients compared with the control group, the results of this study are consistent with the results of a study in Poland, which showed that there is a decrease in serum albumin levels in patients complaining of acquired immunodeficiency syndrome (AIDS) associated with *Blastocystis hominis* infection[14].

This decrease in the serum albumin levels in the infected individuals could be caused by an acute intestinal infection and diarrhea caused by the parasitic infection resulting in malnutrition and malabsorption[23].

The serum levels of total cholesterol, triglycerides, LDL-C, and VLDL were found to be significantly increased in patients with *B. hominis* infection, while HDL-C levels have been reduced in these patients compared with the control group, the results of the current study are consistent with the results of a previous study that showed an increase in serum levels of cholesterol, triglyceride, and LDL-C with reduction in serum HDL-C levels in patients with *B. hominis* infection[11], and also there is another study recorded an increase in serum cholesterol and VLDL levels with decreased serum HDL-C levels in patients with *B. hominis* infection[24].

The increase in the levels of serum lipids in patients with *B. hominis* infection may be due to the ability of this parasite to produce lipids, as some laboratory studies have shown that axenic strains of *B. hominis* appeared to be surrounded by lipid droplets inside the culture medium. It is also noted that these strains contain a spectrum of phospholipids and neutral lipids that are similar to the lipids found in the animal cells, which proves that the parasite produces the lipids by itself, and these lipids include triacylglycerol and diacylglycerol, in addition to all of the phospholipids that enter in the parasite composition[25].

### Table 3: Biochemical parameters comparison between patients infected with *B. hominis* and control groups

<table>
<thead>
<tr>
<th>Biochemical Parameters</th>
<th>Mean ± S.D</th>
<th>Patients group</th>
<th>Control group</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin</td>
<td>37.69 ± 7.31</td>
<td>44.82 ± 8.55</td>
<td>0.0002</td>
<td></td>
</tr>
<tr>
<td>Cholesterol</td>
<td>182.9 ± 48.9</td>
<td>135.2 ± 30.6</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>Triglycerides</td>
<td>133.2 ± 40.3</td>
<td>107.9 ± 26.4</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>HDL-C</td>
<td>41.89 ± 5.53</td>
<td>46.78 ± 4.4</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>LDL-C</td>
<td>119 ± 27.9</td>
<td>76.2 ± 18.6</td>
<td>0.0004</td>
<td></td>
</tr>
<tr>
<td>VLDL</td>
<td>26.47 ± 6.92</td>
<td>21.92 ± 5.03</td>
<td>0.001</td>
<td></td>
</tr>
</tbody>
</table>
Conclusion

Infection with *B. hominis* causes a highly significant increase in the serum concentrations of growth hormone, whereas causing a significant decrease in serum ghrelin concentrations and clear effect on some biochemical parameters in the infected individuals, including total cholesterol, triglycerides, LDL-C, and VLDL which appeared to be significantly increased with reducing the level of serum albumin and HDL-C levels.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: Non

Funding: Self-funding

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Histological and Physiological Effect of Turmeric (Curcuma Longa) on Liver, Pancreas and Kidney

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Abstract

Curcumin, the active ingredient of turmeric, is well known for its broad biological effects. Exhaustive studies on curcumin conducted to revealed its antioxidant, antimicrobial, anti-inflammatory, anticarcinogenic and anti-coagulant activity. The current study was executed to investigate the effect of curcumin on histological and physiological aspects of liver, pancreas and kidney. A total one hundred fifty of chick meat of hybrids Ross 308 (1st day old) were randomly subdivided into two groups: group I (controlled), (n=75) and group II, treated birds (n=75). Group II feed with 50 mg/100kg diet of curcumin. Samples of blood were taken from 50 of chick meat per group to estimate blood parameters. Twenty five chick meat per each group were scarified after forty nine days of feeding with curcumin, the pancreas, liver & kidney were removed for histological processing. After the long-term physiological analysis of our study, results indicated the turmeric is anti-inflammatory and antioxidant properties can scavenge oxygen free radicals, alleviation of fat peroxidation by minimized the levels of liver enzymes ALT, AST and ALP at the level 0.5 of (Curcuma longa). Histologically, the results of this study revealed that employing of curcumin contribute in an improvement of the microscopical architecture of the target organs.

Keywords: Histology, physiology, Curcumin, liver, pancreas, kidney.

Introduction

Curcuma Longa Linn (Turmeric), consider as an important medical herb, Curcumin, a hydrophobic polyphenol extracted from the rhizomes part of curcuma longa, biologically and pharmacologically, curcumin has broad effects and features, in addition to curcumin, this herb contains also bisdemethoxycurcumin, demethoxycurcumin and tetrahydrocurcuminoids. A previous studies and researches provided different evidences indicated that the supplementary diet with curcumin have a potent impact on many biological aspects. Curcumin has been considered as an anti-inflammatory agent, anti-microbial, anti-carcinogenic, antioxidant in addition to its influence as a hepato and nephron-protective, suppressing of thrombosis and myocardial infarction protective.

¹³Evaluated the effects of curcumin on the Zymosan-induced arthritis (acute phase), they showed that the administration of curcumin through the oral cavity minimized the inflammatory influence of this disorder.

Numerous studies improved the anti-inflammatory activity of curcumin, it can be an effectual constituent in treatment of numerous diseases related to the inflammation with its capacity as multi-target and high pharmalogical safety. Recent studies reported the beneficial aspect of curcumin in the field of immunity, that it reinforced innate immunity and induced a large protective immunity.

Curcumin considered as a feed-additives, used in nutrition of animals in order to meliorates the
Qualitatively of food animal origin and to augment the rendering and corroborate of animals. It has also a powerful impact against diabetic cells injury that induced in both pancreas and liver of albino rats. The present study was designed to determine the effect of curcumin on the histological and physiological aspects of three important organs (liver, pancreas, and kidney) and aspects of blood parameters.

Materials and Method

Experimental Animals: This study was conducted at Agriculture College/University of Karbala, according to the criteria and rules of animal care. Total number of animals (150) Ross broiler (age: 1st day) were divided into two groups: group I: control (n=75) and group II treated animals (n=75). The sample of curcumin powder was supplied from the local market. The chick meat of control group were feeding with normal diet, while these of group II were feeding basal diet intermeshed with curcumin powder (50mg/100kg of diet). All animals of groups were chicken sheds with the same conditions (feeding libitum and water).

Analysis of Blood (parameters): Samples of blood (3 ml) were collected from 50 birds or animals (randomly selected) into tubes contained non heparins, from the brachial vein used centrifuge at 3000 rpm for 15 minutes and the serum was kept at a hot temperature -20°C, for the purpose of conducting biochemical analyzes, which are estimated using several (kits). Alanine amino transferase and aspartate amino transferase were found out on the authority of 5. The globulin value for each sample was evaluated by throw away the albumin value from the corresponding overall protein value. The Albumin/Globulin proportion for each sample was acquired by dividing the albumin level to globulin level. Serum total protein was estimated corresponding to 7. Serum glucose was predestined as accordingly to enzymatic colorimetric analysis by 15. Serum total cholesterol was evaluated correspond to 9. Serum creatinine was implement that being the case method of Jaffe 6. So statistical analysis was performed using the complete randomized design (CRD), and t-test of inferential statistic Spss software (version 23) to determine if there is a significant difference between two groups.

Sampling of tissues and Histological Preparation: At the end of the experiment, 25 birds from each group were killed for histological investigation of pancreas, liver & kidney. The specimens of tissue (2 cm) were randomly sampled from different points of previous organs, the specimens were flushed by normal saline 10% and then fixed in Bouins solution for 24 hours. The processing of tissue including serial steps of dehydration (socked specimens were rinsed twice in 100 % alcohol), clearing in xylen, infiltrating and embedding in paraffin and then in paraffin blocks were making. The thickness of histological sections were harvested between 5 um to 7 um by microtome. Five cross sections were randomly taken from each block and were adheres on slides and then complete histological processing by staining step in routine stains of hematoxylin and eosin 4, eventually sections were examined under light microscope and photomicrograph were taken by camera of Hawawi G7.

Results

Histological Results: Histological processing and examination of liver, pancreas, and kidney was done to clarify the effects of curcumin on the normal architecture of these organs. The histological sections of liver, kidney and pancreas from control group (group I) exhibit normal texture and appearance (fig.1-A, fig.2-A, fig.3-A). The histology of liver showed typically appearance of hexagonal lobules with central vein and normal narrow regulating sinusoidal capillaries, normal hepatocytes, lining endothelium of sinusoids and kuppfer cells in addition to the presence of portal areas embedded within the parenchyma (fig.1 A,B). Whereas the results of liver of group II, in general, showed slightly improvement in histological appearance including: more regulated morphological plane and outline of hepatic cells and cords, increased of density of binucleated hepatocytes, more regular hepatic capillaries, endothelial cells that lining sinusoids and kuppfer cells in addition to the presence of portal areas embedded in the parenchyma (fig.1 A,B).

Histological processing and examination of liver, pancreas, and kidney was done to clarify the effects of curcumin on the normal architecture of these organs. The histological sections of liver, kidney and pancreas from control group (group I) exhibit normal texture and appearance (fig.1-A, fig.2-A, fig.3-A). The histology of liver showed typically appearance of hexagonal lobules with central vein and normal narrow regulating sinusoidal capillaries, normal hepatocytes, lining endothelium of sinusoids and kuppfer cells in addition to the presence of portal areas embedded within the parenchyma (fig.1 A,B). Whereas the results of liver of group II, in general, showed slightly improvement in histological appearance including: more regulated morphological plane and outline of hepatic cells and cords, increased of density of binucleated hepatocytes, more regular hepatic capillaries, endothelial cells that lining sinusoids and kuppfer cells in addition to the presence of portal areas embedded in the parenchyma (fig.1 A,B). Light microscopy of pancreas from group (I) revealed normal structure, the appearance of islets of Langerhans cells showed typical histological characteristic features (fig.2-A), and those of group II, exhibit an improvements in the components of tissue including: more regularity in the pancreatic acini and hypercellularity of pancreatic islets especially β-cells (fig. 2-B,C, D,E,F).

Fig. (2): Photomicrograph illustrated the histological structural appearance of pancreas (group I & II), IL: islets of Langerhans, AC: acini, Sp: septa, Blue star: β-cells. H & E, x: 10,40

The architecture of pancreas appear to subdivided into lobules separated by slight septa, closely filled with a purple acini. The cells of acini seems to be pyramidal in shape with rounded nuclei lie at the base of the cells (fig. 2-A).

The results of microscopical histological sections of kidney of group I showed normal appearance of renal tissue including: normal histological architecture of renal corpuscles, normal space between glomeruli and capsule and regularity of renal tubules with their epithelial lining (fig. 3-A). The results of treated group revealed developing in the size and morphology of Bouman’s corpuscles, the cuboidal and columnar epithelial that lining the renal tubules appear more developed and the space that separated the capsule from the glomeruli seems more obvious (fig. 3-A).
**Physiological Results:** Table (1) shows groups of Turmeric powder 0.5% had no significant differences in values of globulins and glucose compared with control group. On the other hand, significant differences of ALP, ALT, AST, CHOL and creatinine in Ross strain of broiler birds.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Control (ALP 0.5% UI/L)</th>
<th>Treatment (ALP 0.5% UI/L)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALP 0.5% UI/L</td>
<td>403.8±77.4</td>
<td>305.1±30.6</td>
<td>0.002</td>
</tr>
<tr>
<td>ALT 0.5% UI/L</td>
<td>14.95±0.41</td>
<td>13±0.98</td>
<td>0.003</td>
</tr>
<tr>
<td>AST 0.5% UI/L</td>
<td>115±6</td>
<td>106±5</td>
<td>0.01</td>
</tr>
<tr>
<td>GLOBULINS MG/DL</td>
<td>21.5±4.1</td>
<td>22.5±2.66</td>
<td>0.6 NS</td>
</tr>
<tr>
<td>CHOL. MG/DL</td>
<td>36±1.4</td>
<td>29.5±1.04</td>
<td>0.05</td>
</tr>
<tr>
<td>CARIETENIN MG/DL</td>
<td>0.9±0.03</td>
<td>0.83±0.07</td>
<td>0.056</td>
</tr>
<tr>
<td>GLUCOSE MG/DL</td>
<td>178.3±9.8</td>
<td>188.8±10.2</td>
<td>0.09 NS</td>
</tr>
<tr>
<td>0.5% WEIGHT</td>
<td>2.28±0.13</td>
<td>2.37±0.29</td>
<td>0.59 NS</td>
</tr>
</tbody>
</table>

**Discussion**

The liver and kidney play an essential role in an excretion and elimination of undesirable materials away from the body, on the other hand, the pancreas considered as an important player in regulation the metabolism process of micronutrients, the current study focused on impact of curcumin on histological structure and physiological aspects of these important organs. Turmeric considered as a populist for centuries in medicines of herbs in treated of different diseases including: diabetic ulcers, anorexia, rheumatism, cough & sinusitis, the curcumin represented the chief curcuminoid components in turmeric responsibly for yellowish colour, it has been found to possess a broad spectrum of therapeutic activities including: antioxidant, anti-inflammatory, anticarcinogenic, anticoagulant, anti-mutagenic and anti-infectious effects.\(^1\)
The predictable alterations in physiology of normal investigated organs after the administration of curcumin have limited accessible informations about the histological and morphological alterations of these organs, therefore, our study conducted on these microscopical changes that expected to be take place parallel to physiological aspects.

The histological findings of liver revealed the preservation of lobular morphology with apparent improvement in the microscopical appearance of the cells and sinusoids capillaries of liver.

Beneficial effects of turmeric have been reported to be associated with stimulation of bile production in the liver of broiler chickens.

There is a recommendation for using turmeric as a feed additive for patients with fatty liver or those who had family history with hyperlipidemic.

The using of turmeric might be beneficial in preventing the fibrosis and ameliorated cirrhosis of liver throughout its anti-inflammatory effect and activity of suppression HSC establishing the hepatoprotectivity of curcumin.

Results of the present work indicated that the histological sections of pancreas for animals of group I and group II showed apparent histological alterations in their tissues that were found to be consistent with that of previous studies.

Summarized the effect of curcumin on pancreatic tissue, depending on previous studies “the pancreatic islets were found to be protected morphologically thanks to the treatment with plant extracts especially the turmeric”.

Our histological achievements of kidney; changes of glomeruli and their number; epithelium cells of glomeruli; interstitial connective tissue and lining epithelia of tubules, all of these aspects are among the reported alterations within the tissue of kidney group II. Curcumin has remarkably take part in the reduction of damage in renal morphological and histopathological characters of an inflammation, apoptosis and fibrosis, furthermore, exhibits reducing of oxidative stress.

Demonstrated that turmeric improved the function of kidney as well as microscopical alteration by alleviating the degeneration and necrosis of tubular lining epithelium, and repairing of tissue or generation of “Islets of Langerhans” in diabetes revealed the beneficial effect of homeostatis in addition to suppression the damage of liver.

Our finding shows that the groups of Turmeric powder 0.5% had no significant differences in values of globulins and glucose compared with control group. On the other hand, significant differences of ALP, ALT, AST, CHOL and creatinine in Ross strain of broiler birds.

Curcuma can scavenge oxygen free radicals like superoxide anions and hydroxyl radicals which play an important role in alleviation of fat peroxidation, by keeping the effectiveness of antioxidant enzymes (superoxide dismutase, catalase and glutathione peroxidase), that enzymes play a substantial role in organizing of lipid peroxidation. The use of Turmeric powder in poultry diets may be decrease the incidence of inflammation and damage cells of organs especially liver and kidney that may minimized the levels of liver enzymes ALT, AST and ALP. The findings of this study are in agreement with who reported the significant increase in performance parameters due to optimum antioxidant efficiency of turmeric (Curcuma longa) and Cinnamon at the level of 0.5% that catalyze protein synthesis by chicken enzymatic system.

 showed that the curcumin exhibits impact of renoprotective by inhibition accumulation of renal lipid and oxidative stress.

Recent studies suggested that curcumin encapsulated chitosan can obviously enhance effect of protection on damages in kidney and heart in diabetes.

A study has indicated that turmeric powder might have therapeutic activity such as anti-inflammatory and antioxidant properties like the anther plant, herbs, and their extract are an alternative to antibiotics.

In conclusion, the histological outcomes of this study of treated animals referred that the administration of curcumin was found to be altered and improved for different levels, the histological architecture of liver, pancreas, and kidney when compared with the control group. These finding comes compatible with that of physiological one.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.
Conflict of Interest: Non
Funding: Self-funding

References


Backache among Different Specialties in Dentistry (An Over World Survey)

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Ph.D Operative Dentistry, Al-Iraqia University, College of Dentistry, Iraq

Abstract

Aim of the Study: The purpose of this study is to determine the prevalence of backache among dentists in different countries, as well as to discover the possible correlation of this prevalence with age, gender, specialty, working posture and how to reduce this prevalence.

Materials and Method: The study was conducted among 600 dentists (359 male and 241 female). Dentists were evaluated with the special self-administered questionnaire (SAQ), for geographic distribution, prevalence of ache and its correlation to different variables in this study.

Results: The outcome of statistics showed a 44.7% incidence of backache among dentists, with the ratio of 51% of Males, and 35.3% of females, with the most incidence of presence of pain over the age of 40s.

Conclusion: Dentists worldwide demonstrate a moderate prevalence of low back pain, with the most incidence of lumber back ache by 50.4%, with correlation to specialty and working position and the geographic distribution.

Keywords: Dentist, Backache; Health care; prevalence; genders.

Introduction

Dentists are at high risk for back ache, working position, recurrent work, and long standing, can result in harm to muscles, joints, bones, ligaments, tendons, nerves, and blood vessels, which can then lead to pain(1). Back pain is the most frequent complaint, and almost all dentists worldwide have experienced this during their work(2).

As dentists use prolonged sitting and standing positions during their job, apply awkward posture and repetitive movements, many loads are exerted to the spine, it is believed that the higher muscular demand may lead to fatigue and consequently increase the risk of back pain(3,4).

In a systematic review, it was reported that the prevalence of general back pain ranges between 64% and 93%, and the most prevalent regions for pain in dentists have been shown to be the back (36.3-60.1%) (5). However, despite technical advances, dentists worldwide and particularly in the Middle East are still at higher risk of developing back pain(6,7).

Different preventive measures can be taken to minimize such pain, such as stretching before work, taking a break in the middle of the work time, performing procedures with good sitting posture, and reducing repetitive motion. However, many other factors may still be associated with this defect, the literature suggests other associated factors are age of the dentist, and type of cases handled(8,9).

Aim of the study: The purpose of this study is to investigate the risk factors, prevalence, and association of physical load and general health status with the onset of backache. Additionally, we aim to determine the dentist’s characteristics, such as age, sex, specialty, country, and working position.

Materials and Method

Study design and data collection: The sample of this study consisted of (600) dentists randomly taken from (23) countries over the world. The study was conducted electronically, and the questionnaires were filled and returned to us directly online by Google forms and data were collected directly by sheet forms.
The questionnaire (figure 1) consists of many steps: the first step is the personal information (Age, Country, Sex, Specialty including: Surgery, Prosthodontics, Periodontics, Conservative, Endodontics, Orthodontics, Oral medicine, Pedodontics, Prevention, General Practitioner). The second step consists of questions related to back pain: if the dentist complains of back pain, site of pain, if the dentist attends for treatment, if gets better after treatment. The final step is the question about position during working this includes: Standing, Sitting, and combination.

1- Age
2- Country
3- Sex
   - Male
   - Female
4- Specialty
   - Surgery
   - Prosthodontics
   - Periodontics
   - Conservative
   - Endodontics
   - Orthodontics
   - Oral medicine
   - Pedodontics
   - Prevention
   - General practitioner

5- Do you complain of back pain?
   - Yes
   - No

6- Site of pain
   - Cervical
   - Thoracic
   - Lumbar
   - Sacral

7- Do you attend for treatment?
   - Yes
   - No

8- Do you get better after treatment?
   - Yes
   - No

9- Your position during working
   - Standing
   - Sitting
   - Combination

Figure 1. The questions that were applied in the self-administrative questionnaire. (SAQ)

Data Analysis: The data were analyzed using IBM SPSS V24, and Microsoft Excel 2019. Two main statistical method are used in the questionnaire data analysis: descriptive statistics, which summarize data from a sample using frequencies and percentages and cross tabulation. Besides, Inferential statistics represented by Chi square test of association were used. To examine the degree of significance and probability values less than 0.05 were considered significantly different, (*, **, *** represent p-value less than 0.05, 0.01, and 0.001 respectively).

Results

Data analysis of this study showed that there’s average age groups as shown in table 1; in which the percentage of age group 20-29 was 11.3 and 30-39 was 41.7 and 40-49 was 29.3 and 50-59 was 16.3, and 60 years and more was 1.3 and in the same table there’s the gender distribution of: male 59.8%, and female 40.2%, and the distribution of specialties.

The frequency of the presence of pain where shown in table 2, and also the sites of pain, showing percentage of those who have pain to attend treatment, percentage of type of treatment (i.e. medicine, exercises, or combination), and further represents percentage of getting better after treatment, and finally prescribes percentage of working positions in which 10.5% standing, 46.3% sitting, and 43.2% combination type of work. Finally, the frequencies of samples between the 23 countries were shown in table 5.

Table 1. Distribution of gender, age groups, and specialties

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>(%) (N = 600)</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>359</td>
<td>59.8</td>
<td>0.001**</td>
</tr>
<tr>
<td>Female</td>
<td>241</td>
<td>40.2</td>
<td></td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>68</td>
<td>11.3</td>
<td></td>
</tr>
<tr>
<td>30-39</td>
<td>250</td>
<td>41.7</td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>176</td>
<td>29.3</td>
<td>0.001**</td>
</tr>
<tr>
<td>50-59</td>
<td>98</td>
<td>16.3</td>
<td></td>
</tr>
<tr>
<td>60≤</td>
<td>8</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Speciality</td>
<td></td>
<td></td>
<td>0.001**</td>
</tr>
<tr>
<td>Oral Medicine</td>
<td>28</td>
<td>4.7</td>
<td></td>
</tr>
<tr>
<td>Conservative</td>
<td>75</td>
<td>12.5</td>
<td></td>
</tr>
<tr>
<td>Prosthetics</td>
<td>52</td>
<td>8.7</td>
<td></td>
</tr>
<tr>
<td>General Practitioner</td>
<td>196</td>
<td>32.7</td>
<td></td>
</tr>
<tr>
<td>Surgery</td>
<td>55</td>
<td>9.2</td>
<td></td>
</tr>
<tr>
<td>Orthodontics</td>
<td>32</td>
<td>5.3</td>
<td></td>
</tr>
<tr>
<td>Prevention</td>
<td>38</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>Pedodontic</td>
<td>30</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>Endodontics</td>
<td>60</td>
<td>10.0</td>
<td></td>
</tr>
<tr>
<td>Periodontics</td>
<td>34</td>
<td>5.7</td>
<td></td>
</tr>
</tbody>
</table>

*Chi square test were used, ***, very high significant (P < 0.001)
Table 2. Percentage of presence of pain, site of pain, if attending treatment, type of treatment, if treatment is effective, position during work.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percent</th>
<th>P-value&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Do you complain of backache</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>332</td>
<td>55.3</td>
<td>0.009</td>
</tr>
<tr>
<td>Yes</td>
<td>268</td>
<td>44.7</td>
<td></td>
</tr>
<tr>
<td><strong>Site of pain</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lambar</td>
<td>135</td>
<td>22.5</td>
<td>0.001***</td>
</tr>
<tr>
<td>Cervical</td>
<td>62</td>
<td>10.3</td>
<td></td>
</tr>
<tr>
<td>Sacral</td>
<td>71</td>
<td>11.8</td>
<td></td>
</tr>
<tr>
<td><strong>Do you attend for treatment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>106</td>
<td>39.6</td>
<td>0.001***</td>
</tr>
<tr>
<td>Yes</td>
<td>162</td>
<td>60.4</td>
<td></td>
</tr>
<tr>
<td><strong>Type of treatment</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Exercises</td>
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<tr>
<td>Medicine</td>
<td>83</td>
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<tr>
<td>Combination</td>
<td>71</td>
<td>32.9</td>
<td></td>
</tr>
<tr>
<td><strong>Do you get better after treatment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>40</td>
<td>18.5</td>
<td>0.001***</td>
</tr>
<tr>
<td>Yes</td>
<td>176</td>
<td>81.5</td>
<td></td>
</tr>
<tr>
<td><strong>Your position during work</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standing</td>
<td>63</td>
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<td>0.001***</td>
</tr>
<tr>
<td>Sitting</td>
<td>278</td>
<td>46.3</td>
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<tr>
<td>Combination</td>
<td>259</td>
<td>43.2</td>
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</table>

<sup>a</sup>Chi square test were used, N.S, **, ***: Not significant, highly significant (P<0.01), Very high significant (P<0.001)

Then after application of statistics, we concluded that P-value of gender to complain of back pain was 0.001, that means there’s a very high significant difference, as the male have high incidence than female.

In table 3 we observe that there’s a very high relation between age groups and pain, as the pain incidence is more in age of 40s and more, also we conclude that there’s a relation between gender and site of pain. And about the relation of age groups to the site of back pain, we found a very high relation especially for cervical and sacral region. In Table 3 also shows relation of specialties to the site of back pain, there’s a very high significant relation, for example: in conservative the more incidence in lumber region, while in orthodontics in cervical. It was found that there’s a very high significant relation of age groups to the working positions, as there’s more standing position with old ages and more sitting in younger ages. Also, there’s a very high significant relation between specialties to the working positions, as shown in Table 4, for example, in surgery there’s a greater number of standing and combination position, while in endodontics there’s is obvious number of sitting positions. We observe a very significant relation of gender to the working positions, for example the number of standing is higher in males than females.

Concerning the relation of countries to the presence of back pain, Table 5 shows that there’s a very high significant relation, for example in Belgium, England, Italy, and Turkey the responses of (no pain) are higher, while in Iraq, India, and Egypt the responses of (yes there’s pain) are higher.
Table 3. Relation of cite of pain to gender, age group, specialty

<table>
<thead>
<tr>
<th>Variables</th>
<th>Site of pain</th>
<th>P-value</th>
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<tbody>
<tr>
<td></td>
<td>Lumbar</td>
<td>Cervical</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
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<tr>
<td>Gender</td>
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<tr>
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<td>Prosthetics</td>
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<td>40.9</td>
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<tr>
<td>General practitioner</td>
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<tr>
<td>Surgery</td>
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<tr>
<td>Orthodontics</td>
<td>4</td>
<td>16</td>
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<tr>
<td>Prevention</td>
<td>11</td>
<td>84.6</td>
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<tr>
<td>Periodontics</td>
<td>7</td>
<td>50</td>
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</table>

Chi square test were used, N.S, *, **, ***: Not significant, significant (P<0.05), highly significant (P<0.01), very high significant (P < 0.001)

Table 4. Relation of position during work to gender, age group, specialty

<table>
<thead>
<tr>
<th>Variables</th>
<th>Position during work</th>
<th>P-value</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Standing</td>
<td>Sitting</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
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<td></td>
<td></td>
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<tr>
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<td>P-value</td>
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<tr>
<td></td>
<td>Standing</td>
<td>Sitting</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td><strong>Speciality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral medicine</td>
<td>4</td>
<td>14.3</td>
</tr>
<tr>
<td>Conservative</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Prosthetics</td>
<td>5</td>
<td>9.6</td>
</tr>
<tr>
<td>General practitioner</td>
<td>15</td>
<td>7.7</td>
</tr>
<tr>
<td>Surgery</td>
<td>22</td>
<td>40</td>
</tr>
<tr>
<td>Orthodontics</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Prevention</td>
<td>6</td>
<td>15.8</td>
</tr>
<tr>
<td>Pedodontic</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Endodontics</td>
<td>4</td>
<td>6.7</td>
</tr>
</tbody>
</table>

\(^3\text{Chi square test were used, N.S, *, **, ***: Not significant, significant (P<0.05), highly significant (P<0.01), very high significant (P < 0.001)}\)

<table>
<thead>
<tr>
<th>Table 5. Relation of countries to the presence of back pain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Country</strong></td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Belgium</td>
</tr>
<tr>
<td>Canada</td>
</tr>
<tr>
<td>Egypt</td>
</tr>
<tr>
<td>England</td>
</tr>
<tr>
<td>France</td>
</tr>
<tr>
<td>India</td>
</tr>
<tr>
<td>Iran</td>
</tr>
<tr>
<td>Iraq</td>
</tr>
</tbody>
</table>
Your country * do you complain of backache

<table>
<thead>
<tr>
<th>Country</th>
<th>Do you complain of backache</th>
<th>Total</th>
<th>Country</th>
<th>Do you complain of backache</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
<td>% within your country</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Jordan</td>
<td>Count</td>
<td>7</td>
<td>1</td>
<td>8</td>
<td>87.5%</td>
</tr>
<tr>
<td></td>
<td>% within your country</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lebanon</td>
<td>Count</td>
<td>9</td>
<td>18</td>
<td>27</td>
<td>33.3%</td>
</tr>
<tr>
<td></td>
<td>% within your country</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Libya</td>
<td>Count</td>
<td>6</td>
<td>11</td>
<td>17</td>
<td>35.3%</td>
</tr>
<tr>
<td></td>
<td>% within your country</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malaysia</td>
<td>Count</td>
<td>18</td>
<td>7</td>
<td>25</td>
<td>72.0%</td>
</tr>
</tbody>
</table>

**Discussion**

The review of the backache of dental operator, indicates that strategies to prevent the multifactorial problem, These strategies address deficiencies in operator position, posture, flexibility, strength and ergonomics. Education and additional research are needed to promote an understanding of the complexity of the problem and to address the problem’s multifactorial nature.\(^{10}\)

In the present study, the main variable we concentrate on was the geographic distribution, in addition to other variables which includes: (age, gender, specialty, position during work), our results agreed with the results of Külcü D et Al\(^1\), were they concluded that the Working duration and posture have important influences on backache in dentistry, and also agreed with Gaowgzeh RA h et al\(^{12}\).

Our study disagreed with Jabbar T.\(^{13}\), who concluded that: Younger dentists had more symptoms than the older dentists. The female dentists had a significantly higher frequency of pain; this disagreement may be due to limitations of his study by number and method of sample selection.

Concerning the relation of back pain with the different specialties in dental field, our study agrees with the Al-Rawi N. et al \(^{14}\), who concluded that the incidence of back pain is related to specialty.

The most important factor in this study is the good number of the sample (and there demographic distribution), while other studies were done locally in some countries Shaik A. \(^{15}\), that’s why it’s not available to compare with other study from this aspect.

When we do an overall review of the studies in this field Vijay S. & Ide M.\(^{16}\), we can easily observe that: within the introduction of time, there’s a general decrease in number of dentists complaining of back pain Regina P. Ford\(^{17}\), (that’s mean comparing to nowadays results of studies), but still we need continuous and meaningful efforts for education of dental students and newly graduated dentist, to ensure good results for our profession in the future.

**Conclusion**

As a result of this study, and within its limitation, we can conclude that there’s a significant relation between back pain of dentists (and its location), with age sex, specialty, and demographic distribution, and it is important for all dentists to follow the correct principles of proper sitting and working to minimize the risk of loss of occupation due to back pain.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding
References

**Stye, Bacterial Eye Infection among the Students of the Technical Medical Institute, AL-Mansour**

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²Professor, Institute of Medical Technology, Al-Mansour, The Middle Technical University, Baghdad, Iraq

**Abstract**

**Background:** Eye stye is a local infection in the form of a red bump (a boil) caused by a blockage and inflammation of the sebaceous glands whose secretions help to form tears. Approximately 90-95% of the causes of “stye” is an infection with *Staphylococcus aureus*, and it is possible that malnutrition and lack of sleep contribute to the infection as well.

**Method:** The study was done at Institute of Medical Technology/al–Mansour/Baghdad from January 2018 till January of 2019. 100 conjunctiva eyes swab and Stye swab samples were collected from students suffered from eye redness and conjunctiva, which include 50 male and 50 female. The diagnoses of specimens were done by using the Analytical Profile Index System (API) for chemical tests and by culturing on enriched and selective culture media to isolate and diagnose the bacteria.

**Results:** The results showed that 57(57%) samples were positive for bacterial eye infections. The study showed high percentage of eye infection among students was due to *Staphylococcus aureus* bacteria, followed by *Staphylococcus epidermides* and *Pseudomonas aeruginosa* (61.40%, 35.08% and 3.50% respectively). Most of bacterial isolates were resistance to antibiotics.

**Conclusion:** One of the most important conclusions is to go to the doctor or pharmacist to treat eye inflammation to avoid the occurrence of eye pain, burning and redness, and not to repeat the infection. Personal and general hygiene must also be taken care of to reduce the spread of bacteria that cause eye infections among people.

**Keywords:** Bacterial conjunctivitis, *Staphylococcus aureus*, Stye, Hordeolum.

**Introduction**

Hordeolum or Stye is an acute bacterial infection that occurs in the covering of the eye or eyelid. This infection is a common condition among Iraqi school and university students, and patients are often directed to go to a university doctor or health care center for diagnosis and treatment. The patient suffers from painful eye inflammation with redness and swelling of the eyelid. Swelling may form on the outer eyelid or on the inner eyelid. This condition usually lasts one to two weeks, and is usually self-healing. It can be treated with warm compresses, massage therapy and some eye ointments¹. 

The doctor may treat a person with a stye by taking topical antibiotics, and in other cases, the removal of the stye may require surgical intervention. All age groups are affected by the infection, although there is a slight increase in the incidence rate among patients between the ages of 30 and 50 years, and with this, the infection may spread within the age groups between 5-20 years. Several researchers have found that there are no significant differences in the prevalence between populations around the world. And most patients who suffer from chronic conditions such as dermatitis, diabetes, high blood fats
(such as cholesterol) and a large number of fast foods, pickles and sugars may be the cause of the spread of infection[2]. Eye begging or humping eyes are the names for furunculosis, or stye, in Latin. It is an inflammation of the sebaceous gland on the eyelid and the sweat glands known as the mole gland[3]. The lesion appears as a small, swollen, red lump containing pus[4]. The Stye of the eye are similar to the sebaceous cyst, but it is smaller and more painful. Usually the infection is acute. Its duration is (7-10) days without treatment. The sebaceous cyst is a chronic infection and it is one of the infections that can only be treated with surgical intervention [5]. One of the most important causes of Stye infection is the bacterial infection by *Staphylococcus aureus* for the meibomian glands (the eyelid gland, which is one of the sebaceous glands located in the eyelid, its secretions prevent eyelids from sticking together) which increase concurrently with poor nutrition, lack of sleep, poor personal and general hygiene, scrubbing the eyes with contaminated hands and the use of contaminated devices such as contaminated towels[4and5]. *Staphylococcus aureus* causes severe infections between 90% and 95% compared to other bacterial species such as *Pseudomonas aeruginosa, Haemophilus influenzae* and *Chlamydia trachomatis*[6].

There are a number of research studies on stye in Iraq and most of them were in primary schools, but there is no study of a stye prevalence among students of the Medical Technical Institute/Al-Mansour. So, the aims of the current study are isolation and diagnosis of *Staphylococcus aureus, Staphylococcus epidermidis,* and *Pseudomonas aeruginosa* causing eyelid inflammation from students of the Medical Technical Institute/Al-Mansour' Baghdad.

**Materials and Method**

**Samples collection and culturing on Enriched and selective culture media:** 100 swabs (50 females and 50 males) were collected from students of the Medical Technical Institute/Al-Mansour, who suffer from Eyelid inflammation, swelling, localized eyelid pain, redness, itching, blurred vision, falling eyes and increased tear secretion. The samples collected during the period from January 2018 to January 2019. Their ages ranged between (19-25) years. All swabs were cultured in a streaking manner on the MacConkey agar, Blood agar and Chocolate agar (Oxoid™ Company, UK) and by two Petri dishes of each type of culture medium for each swab. The dishes were incubated at 37°C for 18-24 hours. The first group of plates was incubated in aerobic conditions, the second group in anaerobic conditions.

**Diagnosis of *Staphylococcus aureus***:

1. The culture characteristics were studied in the culture media, and the shape and aggregation of the bacteria were studied under light microscope using the Gram stain [7].
2. Biochemical tests (oxidase, catalase and coagulase) were performed. Mannitol fermentation using the Mannitol salt agar medium was done [8]. [bioMérieux, France] API Staphylococcus kits were used to diagnose *Staphylococcus aureus*.

**Diagnosis of *Streptococcus pyogenes***:

1. The culture characteristics were studied in the culture media, and the shape and aggregation of the bacteria were studied under light microscope using the Gram stain [7].
2. Biochemical tests were performed using the API *Streptococcus* [bioMérieux, France] to diagnose species belonging to the genus *Streptococcus*.

**Diagnosis of Enterobacteriaceae (Gram-negative bacteria):**

1. The culture characteristics were studied in the culture media, and the shape and aggregation of the bacteria were studied under light microscope using the Gram stain [7].
2. Biochemical tests were performed using the API20 [bioMérieux, France] to diagnose species belonging to the Enterobacteriaceae.

**Antibiotic sensitivity test (disc diffusion method)[8]:** Six antibiotics were used: (Cephalexin (LEX), Cefotaxime (CTX), Chloramphenicol (C), Gentamicin (GM), Tetracycline (TE), Erythromycin(E) (Hi Media Laboratories, India antibiotic discs). Antibiotic sensitivity was determined by measuring the antibacterial inhibition diameter of bacterial isolates on the Muller Hinton agar and comparing it with the index numbers established in the Committee of National Clinical Laboratory Standards (NCCLS)[9].

**Results**

100 samples were collected from students of the Medical Technical Institute/Al-Mansour who were apparently infected with eyelid inflammation and whose ages ranged between (19-25) years and for both sexes (50 females and 50 males) during the period between January 2018 until January 2019. The results showed that 57 samples gave a positive result for bacterial growth on
the enriched and selective culture media, with a range (57%, 57/100X100) of the total number of samples. Bacterial isolates were isolated and diagnosed based on [8-11]. As its cultural and phenotypic properties were studied; the shape and aggregation of bacteria under the light microscope were identified after stained with Gram stain and examined under the X 100. After that, the bacteria were diagnosed using biochemical tests. The results showed the following:

*Staphylococcus aureus* gave white colonies with beta-type hemolysis on Blood agar. Positive for coagulase and mannitol fermentation. *Staphylococcus epidermides* had white colonies without haemolysis on Blood agar, positive for catalase, and negative for coagulase and mannitol fermentation. The colonies of *Pseudomonas aeruginosa* appeared gray on blood agar, pale yellow and non-fermenting lactose sugar on MacConkey agar; positive for oxidase test and negative for urease test and indole production.

The highest percentage of eye infection among students was due to *Staphylococcus aureus* bacteria (61.40%) (Table 1) and this is close to what Al-Abidi isolated in 2006, which was 52.4% for patients suffering from eyelid inflammation in the province of Diwaniyah [12]. Likewise, an approach to the Alash study in 2015, which was 31%, and the current study did not agree with the results of the same researcher’s findings for *Staphylococcus epidermides* and *Pseudomonas aeruginosa*, as the ratio was 10 (35%) and 7 (24%), respectively [13]. The infection of *Staphylococcus epidermides* and *Pseudomonas aeruginosa* among Institute students was 35.08% and 3.50%. The results of current study also did not match the results of the researcher Al-Abidi for *Staphylococcus epidermides* and *Pseudomonas aeruginosa*, which were 7.3% and 14.6%, respectively. The researchers, Thewaini and Abed-Al sahib, concluded in 2014 [14] that the percentage of bacterial infections with eye inflammation after collecting 101 swabs from the eyes of patients who visited Al-Hussein General Hospital and the Hindia Hospital at Karbala in Iraq was 93%, distributed as follows (conjunctivitis eye 2.78 %, Ocular eyelid infections 8.13% and tear sac infections, 9.7%). The results of culturing on enriched and differential culture media showed that the percentage of *Staphylococcus aureus* in both sexes is the most common cause. As for AL-ALani and others [15], their study included isolating and diagnosing the bacteria that cause eye infection in university students who use contact lenses and eyeliner, whose ages ranged between (19-26) years at Al-Anbar University during 2009. The incidence of Staphylococci bacteria was 83.32%, and *Pseudomonas aeruginosa*, 67.16%. Also, they found that the sensitivity to antibiotics was 5.69% for Erythromycin, 52% for Gentamycin, and 8.47% for Tetracycline. While recorded the highest resistance to the antibiotic Penicillin, which was 93.6%, followed by Cephalexin with 93.6%, this may be due to the wrong and excessive use of these antibiotics by patients as well as their use of these antibiotics without consulting a specialist doctor.

Table 1: Percentage of bacterial isolates from patients with eyelid inflammation

<table>
<thead>
<tr>
<th>Bacteria that cause eyelid inflammation</th>
<th>Number of isolates (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>35 (61.40)</td>
</tr>
<tr>
<td><em>Staphylococcus epidermides</em></td>
<td>20 (35.08)</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>2 (3.50)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>57 (100)</strong></td>
</tr>
</tbody>
</table>

The results of the current study showed that the incidence of *Staphylococcus aureus* in females was more than males, it was 55.55% and 64.10%, respectively. Whereas, the infection rate of *Staphylococcus epidermides* and *Pseudomonas aeruginosa* was almost identical for males and females (Table 2).

Table 2: Percentage of bacterial isolates from patients with eyelid inflammation according to sex

<table>
<thead>
<tr>
<th>Bacteria that cause eyelid inflammation</th>
<th>Number of isolates in females (%)</th>
<th>Number of isolates in males (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>25 (64.10)</td>
<td>10 (55.55)</td>
<td>35 (61.40)</td>
</tr>
<tr>
<td><em>Staphylococcus epidermides</em></td>
<td>12 (30.76)</td>
<td>8 (44.44)</td>
<td>20 (35.08)</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>2 (5.1)</td>
<td>0 (0)</td>
<td>2 (3.50)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>39 (100)</strong></td>
<td><strong>18 (100)</strong></td>
<td><strong>57 (100)</strong></td>
</tr>
</tbody>
</table>
The results showed sensitivity to antibiotics Cephalexin (LEX), Cefotaxime (CTX), Chloramphenicol (C), Gentamicin (GM), Tetracycline (TE), Erythromycin (E) as follows:

- **Staphylococcus aureus**: 17.14% sensitive to CTX, LEX, E and C antibiotics; And it is sensitive to 51.42% to GM antibiotic and 5.71% to TE.
- **Staphylococcus epidermidis**: 17.14% sensitive to CTX, LEX, E and C antibiotics; And it is sensitive to 51.42% to GM antibiotic and 5.71% to TE.
- **Pseudomonasaeruginosa**: The resistance rate was 100% for all antibiotics under study.

The researchers Al-Dorri and Al-jebouri[16] were found that the causes of conjunctivitis and eyes redness in Tikrit General Hospital patients in 2004 were result from **Staphylococcus aureus**, **Streptococcus pneumoniae** and **Staphylococcus epidermidis** infection in percentages 42%, 27% and 12%, respectively. Also, they were found that the isolates had the highest sensitivity to the antibiotic norfloxacin. The current study did not agree with the researchers 'study in relation to gender. The researchers found that the percentage of infection with the bacteria that cause eye inflammation was higher in men than it is in women, as it was 55% and 45%, respectively. In Babil Governorate, the researchers Abid and Ewadh[17] found that bacterial etiology of eye inflammation, eyelid and tear cyst inflammation in patients reviewing a number of Hilla hospitals in 2012 was represented by a high incidence of **Staphylococcus aureus** followed by **Escherichia coli** with a percentage of 38.06% and 2.7% Respectively. As the patients suffer from the appearance of a point tending to yellow in the middle of the eye and then it turns into pus and spreads slightly to the surrounding area.

The bacteria that cause eye inflammation can be easily transmitted from one person to another when using contaminated towels. So, hands should always be washed with water, soap, sterilizers, and wash the face frequently; in addition to not use contact lenses until they are completely cured, and not wearing glasses between people or wearing contact lenses or put contaminated eye makeup, and it is also recommended to remove makeup before bed. Azithromycin eye drops can be used after consulting a doctor or pharmacist as a topical treatment, in order to avoid some complications such as bleeding from the eyelids or when the vision is not clear. In addition, students and their supervisors in colleges and institutes should be advised to follow the aforementioned advice in order to prevent the transmission of infections among the students. Sometimes it may be necessary to keep students in their homes to avoid transmitting the infection to colleagues[18].

**Ethical Clearance**: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest**: Non

**Funding**: Self-funding

**References**

16. Al-Dorri Alaa Zanzal Ra’ad and Al-jebouri Wa’ad Mahmood Ra’uf. Microbiological study of patients with Conjunctivitis In Tikrit Teaching Hospital, Microbiological study of patients with Conjunctivitis In Tikrit Teaching Hospital, Tikrit Medical Journal. (2005); 11(2): 28-34.
Uterine Artery and Endometrial Vascularity Doppler Indices and Pregnancy Outcome in ICSI

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Abstract

Background: Good blood flow within uterine arteries and endometrium is important for implantation this study was conducted to determine the role of Doppler indices in prediction of pregnancy outcome during evaluation of ICSI women .Material and Method: It was case control study. 60 infertile women were included in the study and prepared for IVF-ET/ICSI, . All the patients underwent controlled ovarian stimulation, and evaluated by Transvaginal ultrasound and measurements performed on day oocyte retrieval and on day embryo transfer. Assessment of endometrial thickness, pattern and grade of vascularity zones, peak systolic velocity (PSV), end diastolic velocity (EDV), systolic/diastolic ratio, resistance index (RI), and pulsatility index for both uterine arteries and endometrial vessels.

Result: 30 women are pregnant and 30 women, there was significant differences at a cut value of endometrial thickness of ≥ 8 mm between pregnant and non pregnant groups(27 (90 %) versus 20 (66.7 %) with 0.015 p value at day of oocyte retrieval and (27 (90 %) versus 20 (66.7 %) with P value of 0.28 at day of embryo transfer), pregnant women are limited to zone II and III with mainly zone III while non pregnant are mainly zone II. four cases has absent endometrial vascularity at day of embryo transfer, no one of them get pregnancy, there is significant difference in day of embryo transfer regarding endometrial RI being lower in pregnant. Significant differences in uterine PSV and high significant difference in uterine EDV at embryo transfer day.

Conclusion: Endometrial thickness of 8 mm., with vascularity zone III at day of oocyte retrieval and embryo transfer are significant for positive pregnancy outcome, absent endometrial and sub endometrial vascularity at day of embryo transfer predict poor outcome of pregnancy .

Keywords: Doppler indices, uterine blood flow ,endometrial vascularity.

Introduction

In vitro Fertilization and Embryo Transfer (IVF-ET) were currently the most selective and readily available management method for treatment of infertility weather its explained or unexplained. In spite of development in this technique over the last forty years, success has been limited to 15-45 % as a result of implantation failure.(¹) implantation of human embryo only occurs in a receptive uterus at a time of functional changes of the window of implantation, during the mid secretory phase in the menstrual cycle (19-23 days)², during that time profound molecular changes occurs in the stromal component create the state of receptivity³, these changes include specialized natural killer cells recruitment, remodeling of vascular bed and decidualization of stromal fibroblast.⁴

This state of endometrial receptivity is a result although not well understood harmony between ovarian
hormones, growth factors, cytokines, and adhesion molecules\(^5\). And it reflect the end resulting effect of cooperation of the hypothalamic pituitary ovarian axis in preparing endometrium for embryo implantation. The awareness of endometrial receptivity and the presence of window of implantation has been proposed for the first time by scholarly work of Hertig and Rock in 1956\(^6\). clinically Determination of receptive endometrial remains a challenge. In clinical practice the ultrasound has a great and important role in the evaluation and treatment of subfertile women. It is a non invasive efficient and cost-effective method for assessing female reproductive organs.\(^7\)

Ultrasound assessment of endometrial morphology may reveal “readiness”, state of endometrium by endometrial blood flow, pattern and thickness, all have been used as markers for endometrial receptivity and subsequent implantation and pregnancy in IVF.\(^8\) Uterine impedance and perfusion has been linked to subsequent success of implantation\(^9\) further more abnormal uterine artery velocimetry has been associated with unexplained sub-fertility, poorer uterine receptivity to implantation, and recurrent miscarriages.\(^10\) Uterine blood flow is an important factor contributing to uterine receptivity\(^11\) and can be studied by means of two-dimensional (2D)-power color doppler (PCD) ultrasound.\(^12\) in this study ultrasound assessment of anatomical changes include, thickness, pattern and grade of vascularity in addition to assessment physiological 2 D vascular flow indices includes both endometrial and uterine vessels both at day of oocyte retrieval and day of embryo transfer, in ICSI cycle with antagonist down regulation, to determine which time of ultrasound assessment is more predictive for receptivity and pregnancy outcome.

**Subjects material and method:** This is a case control study includes 60 patient, under the age of 39 years have undergone ICSI cycle because of different causes of sub fertility in the high institute of infertility and assisted reproductive technique in Al-Nahrain university in Baghdad between September 2018-february 2019, outcome all patient has written informed consent about their acceptance for participating in this study.

**Method**

Baseline evaluation include medical history, clinical examination and baseline hormonal evaluation and basal antral follicle count by ultrasound at cycle day 2 with gonadotrohin started at a dose determined according to the age and previous cycle response, on cycle day 5 assessment for number and follicular growth rate, till three follicles reach 18 mm at that time trigger of final maturation, at that day just before oocyte retrieval time ultrasound evaluation for endometrial receptivity parameters by 2 D ultrasound using transvaginal probe (5-9 MHz, Voluson P8 GE health care ultrasound machine,) after emptying urinary bladder, by US assess endometrial thickness (the thickest distance between the outer hyper echogenic lines of endometrium. Endometrial pattern, indicating echogenicity of the endometrium relative to the nearby myometrium visualized on a longitudinal ultrasound scan, the endometrium achieves the triple line appearance during the proliferative phase of the menstrual cycle while the endometrium acquires a hyper echogenic appearance at the secretory phase of the menstrual cycle, which is due to stromal oedema. After activation of color Doppler the endometrial vascularity zones are assessed, then pulsed Doppler is activated to measure the indices which includes: peak systolic velocity, end diastolic velocity, systolic to diastolic ratio, resistance index, pulsatility index for both uterine arteries and sub-endometrial and uterine arteries. All these parameter are calculated electronically.

**Results**

**Demographic Factors:** In this case control study, during ICSI cycles 30 patients with positive clinical pregnancy outcome and 30 patients with negative clinical pregnancy outcome, there were no difference in the baseline demographic parameters. There was no significant difference in mean age BMI and type of infertility, primary or secondary between pregnant women and non pregnant women.

Women were also categorized according to causes of infertility as male factor, female factor, combined and unexplained; the difference in the distribution of women according to cause of infertility was not significant \((P = 0.129)\), as shown in figure 1.
Ultrasound assessment for endometrial receptivity at day of oocyte retrieval: There was no significant difference in mean Endometrial thickness between pregnant and non pregnant ladies. However, considering a cutoff value of 8 mm revealed that the frequency of pregnant ladies with an endometrial thickness ≥ 8 mm was significantly higher than non pregnant ladies with an endometrial thickness ≥ 8 mm, there was no significant difference in the frequency distribution of subfertile women according to endometrial pattern, trilaminar versus echogenic, between pregnant and non pregnant groups. There was significant difference in the frequency distribution of subfertile women according to vascular pattern, zone I versus II versus III versus IV, between pregnant and non pregnant groups in such a way that zone I was limited to non pregnant women, Zone II was less frequent and Zone III was more frequent in pregnant ladies, Table 1.

Table 1: Endometrial parameters with vascularity zone.

<table>
<thead>
<tr>
<th>Character</th>
<th>Oocyte retrieval pregnant</th>
<th>Oocyte retrieval Non pregnant</th>
<th>Oocyte retrieval P-value</th>
<th>Embryo transfer Pregnant</th>
<th>Embryo transfer Non pregnant</th>
<th>Embryo transfer P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endometrial thickness - 8</td>
<td>3 (10.0 %)</td>
<td>11 (36.7 %)</td>
<td>0.015 S</td>
<td>3 (10.0 %)</td>
<td>10 (33.3 %)</td>
<td>0.028 Y S</td>
</tr>
<tr>
<td>Endometrial thickness - 8 – 16</td>
<td>27 (90.0 %)</td>
<td>19 (63.3 %)</td>
<td></td>
<td>27 (90.0 %)</td>
<td>20 (66.7 %)</td>
<td></td>
</tr>
<tr>
<td>Endometrial Pattern</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trilaminar</td>
<td>28 (93.3 %)</td>
<td>27 (90.0 %)</td>
<td>1.000 NS</td>
<td>0 (0.0 %)</td>
<td>30 (100.0 %)</td>
<td>0.052 C</td>
</tr>
<tr>
<td>Echogenic</td>
<td>2 (6.7 %)</td>
<td>3 (10.0 %)</td>
<td></td>
<td>20 (66.7 %)</td>
<td>5 (16.7 %)</td>
<td></td>
</tr>
<tr>
<td>Vascularity grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>absent</td>
<td>o</td>
<td>o</td>
<td></td>
<td>o</td>
<td>o</td>
<td></td>
</tr>
<tr>
<td>ZI</td>
<td>9 (0.0 %)</td>
<td>2 (6.7 %)</td>
<td>0.014 Y S</td>
<td>o</td>
<td>o</td>
<td>0.003 Y</td>
</tr>
<tr>
<td>ZII</td>
<td>14 (46.7 %)</td>
<td>22 (73.3 %)</td>
<td></td>
<td>19 (66.7 %)</td>
<td>18 (70.0 %)</td>
<td></td>
</tr>
<tr>
<td>ZIII</td>
<td>16 (53.3 %)</td>
<td>5 (16.7 %)</td>
<td></td>
<td>20 (66.7 %)</td>
<td>8 (26.7 %)</td>
<td></td>
</tr>
<tr>
<td>ZIV</td>
<td>0 (0.0 %)</td>
<td>1 (3.3 %)</td>
<td></td>
<td>o</td>
<td>o</td>
<td></td>
</tr>
</tbody>
</table>
There was also no significant difference in mean Endometrial Peak systolic velocity (PS), mean Endometrial End diastolic velocity (ED) , mean Endometrial S/D ratio between pregnant and non pregnant ladies. Table 2. There was significant difference in mean Endometrial Resistance index (RI) being lower in pregnant ladies, No significant difference in mean Endometrial Pulsatility Index (PI) between pregnant and non pregnant ladies . No significant difference in mean Uterine Peak systolic velocity (PS), mean Uterine end diastolic velocity (ED) ,mean uterine S/D ratio, Uterine Resistance index (RI),mean Uterine Pulsatility Index (PI) between pregnant and non pregnant ladies. Table 2.

### Table 2. Pulsed power Doppler of endometrial and uterine vascularity at day of oocyte retrieval

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Pregnant</th>
<th>Non-pregnant</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>E Peak systolic velocity (PS)</td>
<td>6.09±1.56</td>
<td>6.23±1.23</td>
<td>0.700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>E End diastolic velocity (ED)</td>
<td>3.09±0.67</td>
<td>2.70±1.04</td>
<td>0.085</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>E S/D ratio</td>
<td>2.24±0.62</td>
<td>2.74±1.30</td>
<td>0.065</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>E. Resistance index (RI)</td>
<td>0.51±0.11</td>
<td>0.60±0.16</td>
<td>0.013</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>E. Pulsatility Index (PI)</td>
<td>0.90±0.33</td>
<td>0.94±0.36</td>
<td>0.683</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>U Peak systolic velocity (PS)</td>
<td>37.92±11.78</td>
<td>31.77±14.69</td>
<td>0.079</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>U End diastolic velocity (ED)</td>
<td>6.76±3.58</td>
<td>5.51±3.70</td>
<td>0.189</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>U S/D ratio</td>
<td>6.16±2.06</td>
<td>7.38±6.16</td>
<td>0.310</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>U Resistance index (RI)</td>
<td>0.82±0.06</td>
<td>0.83±0.09</td>
<td>0.620</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>U Pulsatility Index (PI)</td>
<td>1.92±0.49</td>
<td>2.19±0.55</td>
<td>0.052</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS</td>
</tr>
</tbody>
</table>

**Comparison of subfertile women characteristics at day of embryo transfer between pregnant and pregnant ladies:** There was also no significant difference in mean Endometrial Peak systolic velocity (PS) ($P = 0.065$),and mean Endometrial End diastolic velocity (ED) between pregnant and non pregnant ladies ($P = 0.660$).

Moreover, there was significant difference in mean Endometrial S/D ratio between pregnant and non pregnant ladies ($P = 0.032$), Table 3.

Added to that, there was highly significant difference in mean Endometrial Resistance index (RI) between pregnant and non pregnant ladies ($P = 0.037$). Table 3 .Furthermore, there was highly significant difference in mean Endometrial Pulsatility Index (PI) between pregnant and non pregnant ladies ($P = 0.005$). Table 3. In addition, there was highly significant difference in mean Uterine Peak systolic velocity (PS) ($P = 0.004$). There was also significant difference in mean Uterine End diastolic velocity (ED) between pregnant and non pregnant ladies ($P = 0.048$). Table 3.There was also no significant difference in mean Uterine S/D ratio .No significant difference in mean Uterine Resistance index (RI) ($P = 0.731$), No significant difference in mean Uterine Pulsatility Index (PI) between pregnant and non pregnant ladies ($P = 0.924$ table 3.
Table 3. Pulsed power Doppler of endometrial and uterine vascularity at day of embryo transfer.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Pregnant (n=30)</th>
<th>Non pregnant (n=30)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>E Peak systolic velocity (PS)</td>
<td>8.04 ±2.06</td>
<td>6.57 ±3.77</td>
<td>0.065†</td>
</tr>
<tr>
<td>E End diastolic velocity (ED)</td>
<td>2.99 ±1.31</td>
<td>2.81 ±1.84</td>
<td>0.660†</td>
</tr>
<tr>
<td>E S/D ratio</td>
<td>3.03 ±1.01</td>
<td>2.31 ±1.34</td>
<td>0.023†</td>
</tr>
<tr>
<td>E. Resistance index (RI)</td>
<td>0.63 ±0.12</td>
<td>0.52 ±0.25</td>
<td>0.037†</td>
</tr>
<tr>
<td>E. Pulsatility Index (PI)</td>
<td>1.09 ±0.26</td>
<td>0.81 ±0.45</td>
<td>0.005†</td>
</tr>
<tr>
<td>U Peak systolic velocity (PS)</td>
<td>43.73 ±9.04</td>
<td>34.00 ±15.18</td>
<td>0.004†</td>
</tr>
<tr>
<td>U End diastolic velocity (ED)</td>
<td>7.29 ±2.93</td>
<td>5.89 ±2.42</td>
<td>0.048†</td>
</tr>
<tr>
<td>U S/D ratio</td>
<td>6.68 ±2.66</td>
<td>5.67 ±1.82</td>
<td>0.093†</td>
</tr>
<tr>
<td>U Resistance index (RI)</td>
<td>0.82 ±0.05</td>
<td>0.82 ±0.05</td>
<td>0.731†</td>
</tr>
<tr>
<td>U Pulsatility Index (PI)</td>
<td>2.21 ±0.48</td>
<td>2.23 ±0.57</td>
<td>0.924†</td>
</tr>
</tbody>
</table>

Discussion

The endometrial receptivity has long been linked to successful implantation\(^6\), the endometrium is the key factor in reproduction, and many methods have been used for evaluation other than ultrasound, which in non invasive and effective in monitoring controlled ovarian hyperstimulation and has many different studies with different predictors at different cycles days.

In our study, pregnant women had higher mean endometrial thickness than non pregnant at day of oocyte retrieval although this was not statistically significant. This goes with many studies which found no significant difference in the mean endometrial thickness between pregnant and non pregnant women at that day such as schild et al 2001\(^{13}\) and even a study by Kumbak et al. 2009\(^{14}\). By using a cut off value of 8 mm and more, in the current study, there was significant differences with higher number of pregnant women than non pregnant with significant effect of endometrium of 8 mm and more, on pregnancy outcome, similar to observational study by Tao Zhanget al. 2018\(^{15}\) how found a higher pregnancy rate with higher endometrial thickness. At day of embryo transfer our study at a cut of 8 mm and more give significant difference between pregnant and non pregnant groups as in a study by, Kovacs et al. \(^{16}\). On the other hand there was no significant difference with higher thickness in pregnant group, this is similar to other studies like that of kinay et al 2010\(^{17}\), Kovachev et al. at 2005\(^{18}\) suggest that assessment of endometrial volume is better in prediction of pregnancy outcome at day of embryo transfer. This controversy of endometrial thickness as predictor of pregnancy outcome is contrasted with a well known role at day of hCG administration explained in many studies as by Richter et al. 2007\(^{19}\), Traub et al. 2009 \(^{20}\), Chen et al. 2010\(^{21}\), Yu We et al. 2014 \(^{22}\) and Yuan et al. 2016 \(^{23}\).

Triple line appearance was detected in all the studied pregnant women, while most pregnant cases shows echogenic endometrium, these detected differences were statistically not significant similar result obtained from a study, by Bassil et al. 2001 \(^{24}\) while a study by Jarvela et al. 2005\(^{25}\) shows statistically significant.

Vascularity grade shows significant relation in prediction of pregnancy in our study as in many other at day of oocyte studies as Khan et al. 2016 \(^{26}\). Endometrial and uterine vascularity indices at day of oocyte retrieval has non-significant difference regarding pregnancy rate between pregnant and non-pregnant group(Bassilet
al. 2001 and Yuval et al. 1999) only in case of resistance index, as a lower mean resistance indices were found in pregnant group which was statistically significant, in a study by Elham Pourmatroud et al.

**Conclusion**

In our study, endometrial thickness of 8 mm and triple line appearance, s vascularity grade of III is correlated with good pregnancy outcome and absence of endometrial vascularity has a poor pregnancy outcome.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding

**References**

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23. Xi Yuan a, b, c, Sotirios H Saravelos b, Qiong Wang a, Yanwen Xu a, Tin-Chiu Li b, *, Canquan Zhou a, ** Endometrial thickness as a predictor of pregnancy outcomes in 10787 fresh IVF–ICSI cycles Reproductive Bio Medicine Online 2016; 33: 197–205.


Detection of Epstein–Barr Virus and JC Polyomavirus in Gastric Cancer Tissue by Quantitative Real Time PCR

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Abstract

Background: Epstein–Barr virus (EBV) is a ubiquitous virus and it is the first virus recognized as carcinogen, gastric cancer is one of its suspected oncogenic potentials. Also in the last few years, a role of JC polyomavirus (JCV) is suspected in gastric carcinoma. This study is carried out to determine the frequency of EBV and JCV in gastric cancer tissues.

Subjects and Method: A case-control study included 40 gastric cancer tissue samples which were categorized as intestinal- or diffuse-type, and 20 gastric tissue samples which were histologically proven normal or mild gastritis cases taken from patients suspected to have gastritis or peptic ulcer. All these tissues were subjected for DNA extraction and real-time PCR for quantification of EBV and JCV DNA copies in these tissues.

Results: Among these 40 gastric cancer tissues (15%), 6 out of 40 were EBV DNA positive, and 5 out of these 6 tissues were of diffuse type, poorly differentiated, and with lymphocytic infiltration. While none of the control tissues was positive for viral DNA, p=0.023. Moreover, 25% (10/40) of gastric cancers were positive for JCV DNA, 80% (8/10) of them were of intestinal type, and only 10% (2/20) were JCV positive among the control group with significantly higher mean viral load in cancerous tissues (P=0.028), none of the tissues had both viruses.

Conclusion: EBV could be considered one of the important risk factors for the development of gastric cancer, especially of diffused, poorly differentiated, and lymphocytic type looking like EBV-associated nasopharyngeal carcinoma. And JCV could be regarded another risk factor for the development of intestinal-type gastric carcinoma, and there is no association between these two viruses.

Keywords: EBV, JC polyomavirus, Gastric cancer, quantitative real time PCR.

Introduction

Gastric cancer is a serious health problem and it is the third leading cause of death from cancer in the world¹, it is caused by numerous environmental and genetic changes, cancer of the stomach is the fourth common types of cancer distributed worldwide and the second highest mortality rate²,³. Investigating the association between gastric cancer and viral infections especially with Epstein-Barr virus (EBV) had been established along with Helicobacter pylori (⁴).

EBV is one of the ubiquitous human herpesviruses cause lymphomas such as Burkitt’s lymphoma and Hodgkin’s lymphoma⁵, and non-lymphoid cancers such as nasopharyngeal and gastric carcinoma. Epidemiological studies on gastric adenocarcinomas revealed that EBV present in 2–16% of cases worldwide⁶-⁸. In the first of latent period; EBV expresses EBNA1 and EBER, with 40% latent membrane protein

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2A (LMP2A)\textsuperscript{(9,10)}. But there is no expression of LMP1 and EBNA2, which are required for B cell transformation and immortalization\textsuperscript{(11)} that will cause transformation of gastric epithelial cells\textsuperscript{(12)}. In addition, DNA methylation of the host cell; promoter hyper-methylation of tumor-related genes and target-gene silencing by the viral micro RNAs were observed also\textsuperscript{(13-15)}.

Serological studies have indicated that approximately 90% of the world’s adult population is asymptomatic for infection with the human JC polyomavirus (JCV)\textsuperscript{(16)}. The JCV large T antigen can inactivate p53 tumor suppressor gene and members of the retinoblastoma protein (pRb) family to promote uncontrolled proliferation and immortal survival\textsuperscript{(17,18)}.

Depending on the annual Iraqi cancer registration in 2015, the incidence of gastric cancer increased through the last 5 years of registration\textsuperscript{(19)}, the present study was designed to determine the frequency of EBV and JCV in gastric cancer tissue by (qPCR) technique.

**Materials and Method**

A case-control study included forty formalin-fixed paraffin-embedded (FFPE) gastric cancer tissue samples supplied from (Al-Imamin al-Kadhmain Medical City, and Gastro-enetrology and hepatology hospital). These samples were related to patients with confirmed gastric cancer from January 2018 to August 2019. Gastric cancers were categorized as intestinal- or diffuse-type according to the Lauren criteria\textsuperscript{(20)}.

Control tissue sections included 20 FFPE gastric tissue samples which were histologically proven normal or mild gastritis cases taken from patients suspected to have gastritis or peptic ulcer. This study was approved by the IRB (institutional review board) of the College of Medicine in Al-Nahrain University (approval no. 20191023 on 13-11-2019).

**DNA Extraction:** These FFPE tissue issues were cut into thin slices and put in xylene for 10 minutes at room temperature and then washed twice in 99% ethanol. Then, samples were dried at room temperature, followed by adding digestion buffer and Proteinase K and then centrifuged at 14000 rpm for 10 minutes, the supernatant taken for DNA extraction using the QIAamp DNA mini kit (QIAGEN-Hilden-Germany) according to manufacturer instructions.

**Quantification of EBV Viral Load:** Taqman probe-based real time PCR method was used to quantify EBV DNA copies in gastric tissues using EBV Real-TM Quant (Sacace-Italy) for the detection of LMP gene in EBV genome. LMP-gene DNA amplification is detected on JOE(Yellow)/HEX/Cy3 channel; and IC glob (β-globin gene) DNA amplification is detected on FAM (Green) channel (for the total DNA extraction from cell suspension (like biopsy and autopsy material, and whole blood). The master mix for one reaction was 10 μL of PCR-mix-1, 5 μL of PCR-mix-2 buffer and 0.5 μL of hot Starttaq DNA polymerase, and then, 10 μL of DNA from samples/standards/positive or negative controls were added to the mix. Thermal protocol applied was an initial activation of hot Start Taq DNA Polymerase at 95°C for 15 min; then, forty cycles of: denaturation at 95°C for 5 sec, annealing at 60°C for 30 sec, and extension at 72°C for 15 sec, the fluorescence was detected at the annealing step in each cycle.

**Quantification of JCV Viral Load:** Gene Proof PCR kit ISIN Version kit (England) a quantitative real time-PCR kit to detect JCV DNA viral load in the biological materials was used (the target sequence was the gene overlapping the boundary between the gene encoding the VP1 and VP2 proteins).

The real time PCR instrument used was (STRATAGENE MxPro QPCR (Agilent Technologies, USA)). Thirty microliters of JCV mastermix and 10 μl of the (sample DNA, positive or negative controls, or standards) were added into the PCR tubes. Thermal protocol for Gene proof PCR kit was: a two hold steps at 37°C for 2 min, then at 95°C for 10 min, and 45 amplification cycles of 95°C for 5 sec, 60°C for 40 sec and 72°C for 20 sec. Real-time fluorescence is collected in the third step of the amplification cycles.

**Statistical Analysis:** The data of the current study were analyzed using software SPSS version 12.7.6.1. Data were classified into qualitative and quantitative. The quantitative data were also classified into parametric and nonparametric according to normality tests. Chi square and Fisher exact tests were used for association. For quantitative data mean or median difference tests were used. \(P < 0.05\) was considered to be statistically significant.

**Results**

This study included 40 gastric cancer tissues recruited from 20 (50%) males and 20 (50%) females, their mean age was 51.25±9.19. In addition to 20 control
non-cancerous gastric tissues who were comparable in age and sex. Real time QPCR analysis of the gastric cancer tissues showed 15% (6 out of 40) positive, with a mean viral load $4.6 \times 10^4 \pm 2.8 \times 10^5$ copies EBV DNA/10⁵ cells. But none of the control tissues were positive for the virus, $p=0.023$, table (1).

Table (1): Descriptive, pathological and virological criteria of patients and controls

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Patients</th>
<th>Control</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>51.25±9.19</td>
<td>50.85±9.4</td>
<td>0.875</td>
</tr>
<tr>
<td>Sex type (male)</td>
<td>20 (50%)</td>
<td>10 (50%)</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diffuse</td>
<td>16 (40%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intestinal</td>
<td>34 (60%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Differentiation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>26 (65%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>14 (35%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lymphocytes</td>
<td>34 (60%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EBV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>6 (15%)</td>
<td>0 (0%)</td>
<td>0.023 Odds ratio = 1.58 (1.29-1.95)</td>
</tr>
<tr>
<td>Negative</td>
<td>34 (85%)</td>
<td>20 (100%)</td>
<td></td>
</tr>
<tr>
<td>JCV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>10 (25%)</td>
<td>2 (10%)</td>
<td>0.304 Odds ratio = 1.33 (0.85-1.82)</td>
</tr>
<tr>
<td>Negative</td>
<td>30 (75%)</td>
<td>18 (90%)</td>
<td></td>
</tr>
</tbody>
</table>

Results of the current study showed that 5 out of the 6 EBV positive tissues were of diffuse type ($p=0.029$), also 5 out of the 6 EBV positive tissues were poorly differentiated ($p=0.014$), and 5 out of the 6 EBV positive tissues had well defined lymphocytic infiltration ($p=0.029$), table (2).

Table (2): The associations of EBV DNA positivity with cancer pathological types, differentiation, and lymphocytic infiltration

<table>
<thead>
<tr>
<th>Variables</th>
<th>EBV Positive</th>
<th>EBV Negative</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Row N %</td>
<td>Count</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>2</td>
<td>10.00%</td>
<td>18</td>
</tr>
<tr>
<td>Male</td>
<td>4</td>
<td>20.00%</td>
<td>16</td>
</tr>
<tr>
<td>Type</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Diffuse</td>
<td>5</td>
<td>31.30%</td>
<td>11</td>
</tr>
<tr>
<td>Intestinal</td>
<td>1</td>
<td>4.20%</td>
<td>23</td>
</tr>
<tr>
<td>Differentiation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>1</td>
<td>3.80%</td>
<td>25</td>
</tr>
<tr>
<td>Poor</td>
<td>5</td>
<td>35.70%</td>
<td>9</td>
</tr>
<tr>
<td>Lymphocyte</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>4.20%</td>
<td>23</td>
</tr>
<tr>
<td>Yes</td>
<td>5</td>
<td>31.30%</td>
<td>11</td>
</tr>
</tbody>
</table>

On the other hand, JCV DNA was positive in 25% (10/40) of gastric cancer tissues, and 10% (2/20) of none cancerous tissues ($p=0.304$), with a mean viral load $(5.567 \times 10^4$ versus $3.345 \times 10^5$) copies in the gastric cancers and controls respectively, ($p=0.028$) and 8 out of these 10 JCV positive cancers were of intestinal type, table (3).
Table (3): The associations of JCV DNA positivity with cancer pathological types, differentiation, and lymphocytic infiltration

<table>
<thead>
<tr>
<th>Variables</th>
<th>JCV</th>
<th></th>
<th></th>
<th></th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Count</td>
<td>Row N %</td>
<td>Negative</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>4</td>
<td>20.00%</td>
<td>16</td>
<td>80.00%</td>
<td>0.716</td>
</tr>
<tr>
<td>Male</td>
<td>6</td>
<td>30.00%</td>
<td>14</td>
<td>70.00%</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diffuse</td>
<td>2</td>
<td>12.50%</td>
<td>14</td>
<td>87.50%</td>
<td>0.263</td>
</tr>
<tr>
<td>Intestinal</td>
<td>8</td>
<td>33.33%</td>
<td>16</td>
<td>66.67%</td>
<td></td>
</tr>
<tr>
<td>Differentiation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>6</td>
<td>23.08%</td>
<td>20</td>
<td>76.92%</td>
<td>0.717</td>
</tr>
<tr>
<td>Poor</td>
<td>4</td>
<td>28.57%</td>
<td>10</td>
<td>71.43%</td>
<td></td>
</tr>
<tr>
<td>Lymphocyte</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>7</td>
<td>29.17%</td>
<td>17</td>
<td>70.83%</td>
<td>0.711</td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>18.75%</td>
<td>13</td>
<td>81.75%</td>
<td></td>
</tr>
</tbody>
</table>

**Discussion**

EBV is a highly sero-prevalent virus in Iraq, which is about 80% as shown by a recent study in 2017 (21), also by real time PCR (33%) (22). EBV-associated gastric cancer (EBVaGC) has become a well-defined clinical entity (23). The current study found that 6 out of 40 (15%) of gastric cancer tissues are EBV DNA positive by quantitative real time PCR. A result that is very close to other studies that gave the range of EBVaGC of 1.7-16% among gastric carcinomas throughout the world (24). The quantification of EBV viral load by qPCR in gastric cancerous tissue highlights a high viral load associated with carcinogenesis of stomach cells. A study of Ryan, et al. showed that a cutoff value of 2000 copies for 100000 cells is considered as a threshold for determining EBV correlated to gastric cancer (25), which support the results of this study in which the mean VL was $4.6 \times 10^4 \pm 2.8 \times 10^5$ copies EBV DNA/10$^5$ cells.

This value of 15% EBV DNA in gastric cancer tissues is also associated with significant relation with diffuse type, poorly-differentiated and obvious lymphocytic infiltration. Which are also in agreement with other studies that showed EBVaGC mostly poorly differentiated adenocarcinoma, with diffuse and intense lymphocytic infiltration that is resembling EBV-associated naso-pharyngeal carcinoma (26).

Around 1.7-16% of gastric cancers have been identified as EBV-positive (24). Thus, EBVaGC is regarded the most common cancer among EBV-associated malignancies (23). In 1990, Burke et al. (27), the first who reported EBV-positive GC by PCR, and Fukayama et al. (28), found that EBVaGC result from the monoclonal proliferation of EBV-infected cells. In addition, it has been shown that EBERs have an oncogenic role by inhibiting apoptosis (28).

In the current study, JCV was detected in 25% of gastric cancerous tissues a result that is comparable to previous results (29), however, it is less than the frequency reported by other studies (30) which was more than 50%, which is probably because the target genome in our study was on VP1-VP2, while those studies target genome was the oncogene large T antigen that gave higher frequency in the cancerous tissues (30). On the other hand, JCV tissue viral load was significantly higher in the gastric cancer tissue (more than 10 times that of the none cancerous tissue) which is also in accordance with another study of JCV on gastric cancer tissues (18), and the higher frequency of JCV in intestinal type of gastric cancer also agrees with Ksiaa et al in 2010 (29) who suggested a role of JCV as a cofactor in the pathogenesis of the intestinal type of gastric carcinoma.

**Acknowledgement:** We would like to thank all the patients and their families for their willingness to participate in this study, and all staff of Surgery Department/Al-Imamain Al-Kadhumain Medical City, for help in collection of patient samples, In addition many Thanks to school of medicine–Al Naharain University for financial support.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of
both MOH and MOHSER in Iraq.

Conflict of Interest: None

Funding: Self-funding

References


Study of the Level Total Antioxidant Capacity in Urinary Stones Patient

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3Board Specialist In Laboratory Diagnosis, Ministry of health, Iraq

Abstract

The study was conducted over a hundred patients renal stone and forty apparently were taken as control group. The renal stone comprised one hundred patient aged (10-70 years) with mean ± standard deviation of (46.10± 16.30) years. The Control group includes forty apparently healthy individuals aged (20-65 years) with mean± standard deviation (30.22 + 11.36) yea . The study was conducted of the 1th period from February 2019 to the April 2019. Samples collected from outpatient Department AL- Hilla Teaching Hospital. All patients underwent full history and physical examination, including (age, sex, medical family history and the presence of stones formation frequently in the patient and other chronic diseases), Venous blood samples was collected from patients with renal stones and control subjects by using disposable (5 ml) of each patient taking (1 ml) of it and put it in tube with coagulation contain EDTA blood and leave the rest to coagulate for 10-15 minutes in Temperature of 37 ° C and then enter the rotation speed of 1800 rpm is obtained blood serum and then the serum was stored in -20 degree,

Keywords: Antioxidant; health; patients; urinary stones; blood.

Introduction

Urinary system stone is the most common cause of kidney disease and poses a remarkable health care burden on adults. Recent studies have shown that the prevalence of kidney stones is increasing, and that 1 out of every 11 Americans have kidney stones. On the other hand, global statistics have shown that the number of people with kidney stones has almost doubled in the last 15 years (1). Several factors are effective in the development of kidney stones including sex, race, age, climate, nourishment, and genetics (2,3). Recent studies have also shown that nutrition, lifestyle factors, and metabolic factors are instances of the most important factors involved in developing kidney stones (3,4). In economically advanced countries, 70% of the total kidney stones contain calcium oxalate or phosphate (5). The disease is more common among the people aged 30-60 years and, more common to men than to women (3). The formation of kidney stones is multifactorial pathogenesis, and there are several stages in the formation of stones in the renal tubes (5). Among various mechanisms for the formation of kidney stones, the damage of tubular cells and thus facilitation of the crystallization of sediment could be considered as the most possible mechanism (6,7). Numerous studies have determined that damage to tubular cells could be caused by the presence of oxalate and calcium oxalate crystals (5). However, it is known that damage to renal epithelial cells in the patients with kidney stones could be due to oxidative stress (8). Oxalate-induced membrane damage is promoted by lipid peroxidation (LPO) and oxidative stress, which is a degradative process due to the presence of reactive oxygen species (ROS) (8,9). LPO could be assayed by measurement of serum malondialdehyde (MDA) levels in the patients with renal stones. In

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addition, various studies have reported that the vicinity of kidney epithelial cells with different crystals leads to the production of ROS (8). On the other hand, ROS through damage to and chemical changes on proteins, lipids, and carbohydrates, alter the kidney function. Association of calcium stone formation and the reduction of antioxidant levels have been suggested (10). The most common type of urinary stone found in humans worldwide is calcium oxalate (CaOx). The important risk factors of CaOx stone formation are urinary supersaturation, increased urinary stone promoters, such as calcium and oxalate, and depleted urinary stone inhibitors such as citrate and magnesium (3,5). Urinary supersaturation is a state that the concentration of solutes in urine exceeds the saturation point, causing spontaneous precipitation of solutes, with the inadequacy of stone inhibitors and urinary alkalization, calcium from a water-insoluble complex with oxalate. These crystals will aggregate and adhere to the renal tubular epithelium with the presence of urinary adhesion molecules. Regarding these, genetic susceptibility in a family with nephrolithiasis may play an important role in pathogenesis of stone formation than our current awareness. Evidence reported that stone disease occurred at a younger age and higher frequency in any population with nephrolithiasis patients in the family (11). As an antioxidant enzyme, superoxide dismutase (SOD) plays an important role in ROS removal by resisting oxidative stress and decomposing super oxide into oxygen (O2) and hydrogen peroxide (H2O2) (10).

Material and Method

One hundred patients (67 males and 33 females) in the age group ranging from 5-75 years old, admitted to Al-Hila Teaching Hospital, Urology Department from the period 1st of December 2013 till 30th of June 2013. Forty apparently healthy individuals were taken as a control group. This group comprises of 20 males their age ranging from 22-55 years, and 20 females their age ranging from 23-60 years. All tests had been performed on serum in Biochemistry department in the College of Medicine of Babylon University. Blood samples have been collected from patients and control subjects. Blood samples were withdrawn without the use of tourniquet. Both the sera from patients and controls are used for the measurements of the Serum total antioxidant.

Result

The total number of patients with renal stones was One hundred patients in the age group ranging from 5-75 years old at time of presentation, the high percentage of patients (23%) found in age group (35-45) years old. Most of antioxidants are electron donors and react with free radical to form more stable end products such as water. Thus, antioxidants can inhibit the free radical and protect against cellular damage from ROS. Concentration of Total antioxidant (TCA) was decrease in patient with kidney stone compare to control group show in the tables (1, and 2).

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Gender</th>
<th>No.</th>
<th>Mean ± SD</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td>Patient group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male+ Female</td>
<td>100</td>
<td>44.29 ± 16.30</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>67</td>
<td>40.47 ± 12.72</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>33</td>
<td>43.05 ± 15.05</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male+ Female</td>
<td>40</td>
<td>34.29 ± 10.38</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>20</td>
<td>30.10 ± 10.036</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>20</td>
<td>38.55 ± 9.121</td>
<td></td>
</tr>
</tbody>
</table>
Table (2) Characteristic of patients group and control groups related with the Total antioxidant in the different groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>Number</th>
<th>TAC (u/ml) Mean &amp; SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uric acid</td>
<td>35</td>
<td>6.47±3.005</td>
<td>P&lt;0.001</td>
</tr>
<tr>
<td>Calcium oxalate</td>
<td>39</td>
<td>10.016±2.909</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>Calcium phosphate</td>
<td>14</td>
<td>8.76±2.81</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>Uric acid + Carbonyl</td>
<td>1</td>
<td>10.580</td>
<td>__</td>
</tr>
<tr>
<td>Calcium oxalate + Calcium phosphate</td>
<td>2</td>
<td>3.465±1.195</td>
<td>__</td>
</tr>
<tr>
<td>Uric acid + Calcium phosphate</td>
<td>2</td>
<td>7.97±0.926</td>
<td>__</td>
</tr>
<tr>
<td>Cystine</td>
<td>3</td>
<td>3.120±1.066</td>
<td>__</td>
</tr>
<tr>
<td>Tri phosphate</td>
<td>4</td>
<td>9.53±1.529</td>
<td>P&gt;0.05</td>
</tr>
<tr>
<td>Control</td>
<td>40</td>
<td>16.67±2.35</td>
<td>P&gt;0.05</td>
</tr>
</tbody>
</table>

**Discussion**

The results showed a significant differences in age of patients with renal stones compare with those of the control group most pediatric kidney stones are predominantly composed of calcium oxalate; struvite and calcium phosphate stones are less common, Calcium oxalate stones in children are associated with high amounts of calcium, oxalate, and magnesium in acidurine(12). Urolithiasis was found to be most predominant in the age group of 31-40 years(13). Age group of early twenties to late forties is physically most active period in life. another possible mechanism may be due to increased level of serum testosterone in age group of 21-40 years, which resulted in increased production of oxalate by liver from its endogenous precursors(14). suggested that the statistically decrease in total antioxidant in kidney stone patients as compared to controls. Increased levels of TAC indicate absorption of stock organ antioxidants(15). uric acid and the induction or activation of antioxidant enzymes as an adaptation to the oxidative stress, but at a later phase of oxidative stress, the TAC falls due to depletion of antioxidants(16). In addition, high concentration of a number of metabolites, including uric acid can lead to pro-oxidant effects, introducing a further decrease of the antioxidant capacity (17).

**Conclusion**

The study showed that the serum concentration of total antioxidant (TAC) was decreased significant in patient with urinary stone when compared with control (p<0.001) in uric acid, (p<0.05) in clcium oxalate, (p<0.05) in calcium phosphate

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** None

**Funding:** Self-funding

**Reference**

Association of LPL Gene Variant and Serum LPL Level with Ischemic Stroke in Iraqi Population

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Abstract

Background: Lipoprotein lipase (LPL) plays an important role in plasma lipoprotein metabolism. An increasing number of studies have suggested an association of LPL gene variants with the risk of cardiovascular and cerebrovascular diseases.

Objective: To analyze whether Hind III polymorphism of LPL gene and serum LPL level are associated with ischemic stroke in Iraqi population.

Method: Fifty ischemic stroke patients (clinical diagnosis and x-ray CT) and fifty controls were enrolled in this case–control study. The LPL Hind III polymorphism was determined by PCR-RFLP technique and LPL mass level was estimated using a sensitive sandwich enzyme-linked immunosorbent assay (ELISA).

Results: In the present research was not found any association between the Hindlll LPL gene polymorphism and acute ischemic stroke in the population studied; the allele and genotypic frequencies of the studied polymorphism was similar in cases and controls and followed the Hardy-Weinberg equilibrium. The relationship between Hind III genotypes and the LPL mass level was analyzed using ANOVA and further confirmed by Post-hoc analysis. there was no significant difference in LPL mass levels between the genotype groups H+H+, H+H-, and H-H- (p value>0.05).

Conclusions: The Hind III polymorphism of LPL is not a genetic marker for the development of ischemic stroke as well as not determinants of serum LPL level in the Iraqi sample used.

Keywords: Protein lipoprotein, lipase, ischemic stroke, polymorphism association risk.

Introduction

Cerebrovascular diseases are characterized by a neurologic deficit, due to a focal vascular lesion in the central nervous system, it includes cerebral infarction, intracranial hemorrhage and subarachnoid hemorrhage[11]. Studies have posited the lipoproteinlipase (LPL) gene as the most viable candidate for study due to its contribution to the interindividual variability in lipid levels and their consequent role in atherosclerosis, as well as to the possible correlation between hyperlipidemia and CVD[2,3]. Evidence suggests that variations in the lipoprotein lipase gene may influence stroke risk[4]. LPL has a major role in triglyceride (TG)-rich lipoprotein metabolism by catalyzing the hydrolysis of TG in chylomicrons and very low-density lipoproteins to form chylomicron and very low-density lipoprotein remnants, respectively[5,6]. The human LPL gene is located on chromosome 8p22, spans approximately 35 kb and contains 10 exons encoding a 448 amino acid mature protein[7,8]. Genetic studies have revealed almost 100 mutations and single nucleotide polymorphisms in lipoprotein lipase gene in humans[9]. A HindIII polymorphism located on intron 8 has been associated

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with subtle alterations in plasma lipids in which a replacement of thymine (T) with glutamine (G) base occurs at position +495 abolishing the HindIII restriction enzyme recognition site \(^{[10]}\), and has been associated with hyperlipidemia and diabetic nephropathy\(^{[11]}\). Biochemical assessment of LPL function has also frequently been used to assess the role of LPL in atherogenesis. However, these studies are hampered by the need to administer heparin intravenously to release sufficient LPL from the endothelium to measure reliably LPL activity and LPL concentration. Because heparinization is time-consuming, not standardized, and induces bleeding risk, most investigators have only studied limited numbers of diseased and/or non-diseased individuals. Recently, the availability of a highly sensitive enzyme-linked immunosorbent assay, which can measure accurately freely circulating LPL concentration in non-heparinized serum has provided a tool to more easily assess the relationship between LPL and ischemic stroke. It was recognized that the majority of serum LPL is catalytically inactive and likely represents a mere catabolic product of catalytically active LPL that is bound to the endothelium. Also, it was demonstrated that serum LPL concentration is not associated with post-heparin LPL concentration or LPL activity \(^{[12]}\). It has been demonstrated that a reduced concentration of plasma LPL mass is associated with an increased risk of coronary artery disease\(^{[13-15]}\).

### Materials and Method

**Pre heparin LPL mass measurement:** Blood samples for LPL mass measurements were withdrawn from subjects and then put in plane tube without anticoagulants to obtain serum. The levels of LPL mass was measured by the sandwich enzyme-linked immunosorbent assay (ELISA).

**DNA isolation and genotyping:** Five ml of blood was collected in EDTA tubes. Genomic DNA was extracted from blood samples using the INTRON (korea) kit. The LPL HindIII polymorphism in intron 8 was analyzed by PCR-RFLP technique. The primers used for the amplification of the LPL gene bearing the polymorphism are Forward: 5’-TGAAGCTCAATGGAAGAGT-3’ and Reverse5’- TACAAGCAAATGACTAAA-3’. The amplification protocol involved a denaturation of the DNA segment at 94°C for 30 sec, then annealing the segment at 50°C for 30 sec and an extension segment at 72°C for 45 min, this repeated for 35 cycles and the final extension for 5 min. The amplified 715 bp PCR product was digested with HindIII restriction enzyme by incubating at 37 °C for 2 hours followed by separation of fragments on 1.5% agarose gel for one hour at 90 volt. Hind+ve allele was detected as fragments of 600 bp and 115 bp base pairs (bp) while as Hind–ve allele was detected as fragment of 715 bp.

### Results

The variables of diabetes, Hypertension and Smoking were presented with statistically significant difference.

**The levels of preheparin LPL mass in ischemic stroke patients and the control group:** Serum lipoprotein lipase level (median with interquartile range Q1 and Q3) in ischemic patients was 137.8 (83.75, 164.8) and not significantly different from that of control subjects 116.0 (80.97, 127.1) as shown in the figure 1. The Mann-Whitney U value was 723.5 and the p value was 0.10.

![Fig 1: serum lipoprotein lipase (pg/ml) among patient and control groups. median with Q1 and Q3.](image)

**Genotyping:** Polymorphisms allowed making the allele assignation in each sample for each polymorphism (Fig. 2).
Figure 2: Genotyping of HindIII polymorphisms in lipoprotein lipase gene. Restriction fragments length polymorphisms (RFLP) on 1.5% agarose gel at 90 volt/hour DNA 50 bp marker.

Lane 3,4,5,6,7,10: H+H+ genotype homozygote for presenting of 600bp and 115bp. Lane 1,8,9,11,12: H+H- genotype heterozygote for presenting of 715, 600, and 115bp. Lane 2: H-H- genotype homozygote for absence of cutting site.

Genotype and allele frequencies: The genotypes and allele frequency between the patients with ischemic stroke and the healthy subjects were in agreement with the Hardy–Weinberg equilibrium. The genotype distribution and the allele frequency for LPL gene polymorphisms are summarized in Table 1. Most frequent genotype was H'H' in ischemic patients and control subjects 29(58%), and 34(68%) respectively. H'H' in control is higher than of patients. H-H- was the lowest frequent genotype in both study population, and was in patients 3(6%) lower than of controls 6(12%). H+H- was the intermediate genotype among both patients 18(36%) and control 10(20%) and was higher in patients.

Table 1: The Genotype Distribution and the Allele Frequency of LPL-Hind III gene Polymorphism among Study Groups

<table>
<thead>
<tr>
<th>Study group</th>
<th>LPL genotype(%)</th>
<th>Total Allelic frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H+H+</td>
<td>H+H-</td>
</tr>
<tr>
<td>Case</td>
<td>29(58%)</td>
<td>18(36%)</td>
</tr>
<tr>
<td>Control</td>
<td>34(68%)</td>
<td>10(20%)</td>
</tr>
</tbody>
</table>

Association between polymorphisms and stroke: In order to study a possible association between the polymorphisms and stroke develop, we calculate OR value for each of the inheritance patterns. We did not find association by evaluating OR between polymorphisms and stroke development (Table 2).
Table 2: Association for each inheritance pattern with stroke

<table>
<thead>
<tr>
<th>Polymorphism</th>
<th>Model</th>
<th>Genotype</th>
<th>OR</th>
<th>CI 95%</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>rs320</td>
<td>Codominant</td>
<td>H+H+</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>H+H-</td>
<td>0.474</td>
<td>0.189-1.187</td>
<td>0.159</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H-H-</td>
<td>1.706</td>
<td>0.391-7.43</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dominant</td>
<td>H+H+</td>
<td>1.00</td>
<td></td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H+H-, H-H-</td>
<td>0.65</td>
<td>0.287-1.472</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recessive</td>
<td>H+H+, H+H-</td>
<td>1.00</td>
<td></td>
<td>0.295</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H-H-</td>
<td>2.136</td>
<td>0.503-9.067</td>
<td></td>
</tr>
</tbody>
</table>

The relationship between HindIII polymorphism and pre heparin LPL level: The relationship between HindIII polymorphism and pre heparin LPL levels has been given in figure 3. In present study, no significant difference in serum LPL levels between genotype groups H+H+, H+H-, and H-H-, with mean and standard deviation 132.0 ± 78.87, 116.3 ± 35.76, 129.8 ± 52.05, respectively as shown in figure Fig(3). p value 0.622.

Discussion

To the best of our knowledge, this is the first study to evaluate the association between HindIII polymorphisms of the LPL gene and ischemic stroke in Iraqi population. Data showing no significant association between lipoprotein lipase gene polymorphism HindIII and stroke in the Iraqi simple analyzed; suggesting that this polymorphism cannot be used as genetic markers to predict risk for stroke development. A number of studies have suggested the implication of HindIII polymorphism located on intron 8 of LPL gene in the pathophysiology of cardiovascular and cerebrovascular diseases[14-15]. Recently, we have noted that HindIII variants in the LPL gene have association with atherothrombotic cerebral infarction. However, a study carried out by Xu et al. [16-17] in a Chinese population could not establish an association between HindIII polymorphism of LPL gene with atherosclerotic cerebral infarction. Study occur in 2020 demonstrate association between HindIII and coronary artery disease [18]. Thorn et al. have reported a significant association of HindIII+ve allele with severe coronary atherosclerosis[19-21]. Chen et al. reported a significant correlation between carotid artery atherosclerosis and Hind III polymorphism in White male subjects. Furthermore, meta-analysis study suggested that LPL HindIII variants were associated with a decreased risk of stroke in the Asian population, but not in the non-Asian population [22]. Another meta-analysis indicated that risk of stroke was decreased in rs320 polymorphisms in the LPL gene [23]. Munshi et al. suggests that the HindIII polymorphism of LPL is significantly associated with ischemic stroke risk[24]. However, Velásquez et al published that the HindIII polymorphism no associated with ischemic stroke in Latin America [25]. Allele frequencies for the HindIII polymorphism in our study were nearly to those found in in the dbSNP database for east Asia population and genetic studies done in different ethnic groups including (USA)[26], This may be due to LPL levels are controlled by many factors, including differential transcriptional regulation in adipose and skeletal muscle tissue, post-translational modification and translocation over the endothelium, retro-endocytosis, binding to heparan sulfate- containing proteoglycans, lipoproteins, and receptors, and hepatic clearance[27-30] in our knowledge.
no previous study has been reported to demonstrate the relationship between the ischemic stroke and this marker. The present study showed no significant differences of LPL levels among LPL genotypes, so HindIII was not be as determinant of LPL level. The genetic determinants of preheparin LPL mass and the separate relationships between LPL gene polymorphism and serum LPL mass with ischemic stroke is unknown. And also information on LPL mass is severely lacking, in particular with respect to interaction with gene polymorphism. Our data in inconsistent with that reported on 640 middle-aged Chinese, in whom LPL-HindIII and PvuII polymorphisms were found to be determinants of preheparin plasma LPL concentration, which was in turn independently modified by smoking and obesity[31].

**Conclusion**

In our study, the presence of the HindIII polymorphism of the LPL gene was not a risk factor for the development of ischemic stroke and not significantly associated with the LPL mass level as well as the LPL level not associated with increased risk of ischemic stroke.

**Acknowledgements:** All the staff of al Sader teaching hospitals especially neurological department. Special acknowledge to the institutions and people who participated in recruiting the patients.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** None

**Funding:** Self-funding

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The Effect of Vaccinated and Unvaccinated Bridles Flocks on Identification of Avian Metapneumovirus (aMPV) and Ornithobacterium rhinotracheale (ORT) in the Middle Euphrates Region in Iraq

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Abstract

The swollen head syndrome is one of the most upper respiratory problems in poultry that causing high economic loss in poultry. SHS is infected of all ages mainly 4-6 weeks old with morbidity may reach to 10% and mortality about 2%. Avian metapneumovirus (aMPV) is one of the most important etiological factors that causing swollen head syndrome (SHS), (aMPV) is a member of sub family Pneumovirinae under the family Paramyxoviridae, also this family characterized by RNA non segmented negative sense genome, Ornithobacterium rhinotracheale (ORT) is one of the most important etiological factor of (SHS) is one of a contagious disease that capable to infect avian species, primarily in turkeys and chickens, causing marketable respiratory distress, decreased growth, and mortality will be depending on many factors like combination with viral infection like aMPV. Study the effect of vaccinated flocks with (ND, IB, IBD) with identification of Avian metapneumovirus (aMPV) and Ornithobacterium rhinotracheale (ORT), in middle Euphrates region in Iraq.

Keywords: Vaccine; Avian metapneumovirus; toxicity; bridles.

Introduction

Swollen head syndrome is a disease of chickens of all ages mainly 4-6 weeks old with morbidity may reach to 10% and mortality about 2%.[¹] The affected birds show depression, decrease the feed intake, nasal exudate, sneezing, coughing and conjunctivitis then many progress to facial edema which start around eye extending over the head and descending to submandibular tissues also, nervous signs may be seen like the etiology of SHS is uncertain and it is torticollis, opisthotonos, and incoordination.[²]

O. rhinotracheale is one of Gram-negative, pleomorphic rod-shaped bacterium causing upper respiratory disease in the commercial poultry industry[³], belonging to superfamily VrRNA and it is one of the family of Flavobacteriaceae also it is from the Cytophaga_lavobacterium_Bacteroides descending genetic line. ORT[⁴], first time isolated in Germany in 1981 from five-week old turkeys showing nasal discharge, facial edema and fibrinopurulent airsacculiti[⁵], and first isolation in united states was in 1989. In 1993, it was formally characterized. In 1994, after isolating and evaluating 21 strains associated with various respiratory tract infections, Ornithobacterium rhinotracheale was given its current name[⁶].

Avian metapneumovirus, also recognized as turkey rhinotracheitis, is a part of the subfamily Pneumovirinae[⁷] in the family Paramyxoviridae, induces widespread turkeys, and chicken flocks and many other bird species such as pheasants, Muscovie duck and guinea fowl.
Geese, most other ducks and potentially pigeons are suggested to be disease[8]. The infection with aMPV is characterized by an inflammation of the high respiratory tract in poultry and also considered a known risk factor for triggering swollen head syndrome (SHS) in broiler and broiler breeders also loss of egg production in layers had been reported[9], as it is well known as main etiological factor in chickens that have secondary bacterial infections complicate the development of the typical SHS by organisms like ORT[10].

Present study amide to identify the effect of vaccinated flocks with (ND, IB, IBD) with identification of Avian metapneumovirus (aMPV) and Ornithobacterium rhinotracheale (ORT), in middle Euphrates region in Iraq from typical infected flocks with swollen head syndrome.

Material and Method

The collection of samples was carried out during the period from the beginning of September 2018 till end of August 2019 on 67 poultry farms them ages ranged between (3-6) week old, three to four typical SHS cases were taken from each farm and pooling together in one it have been preserved on transport media and uploaded on FTA cards in the same time[11].

The fields that were surveyed were distributed in the middle Euphrates region and from several governorates as shown in table (1).

Table number (1) That show number of infected farms in middle Euphrates region

<table>
<thead>
<tr>
<th>Government</th>
<th>Samples number</th>
<th>Samples code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baghdad</td>
<td>2</td>
<td>B</td>
</tr>
<tr>
<td>Wasit</td>
<td>10</td>
<td>W</td>
</tr>
<tr>
<td>Karbala</td>
<td>14</td>
<td>K</td>
</tr>
<tr>
<td>Al Muthanna</td>
<td>7</td>
<td>M</td>
</tr>
<tr>
<td>Najaf</td>
<td>13</td>
<td>N</td>
</tr>
<tr>
<td>Al-Qadisiyyah</td>
<td>21</td>
<td>Q</td>
</tr>
</tbody>
</table>

The samples were divided in to two groups the first one that put in transport media (indirect method) then carry to laboratory for culturing and detection, the second group put on FTA card (direct method)[9] to saving genetic materials for microorganism and detection by using RT-PCR, each FTA cards that have four wells each well capable to save four samples, so (2-4) samples were uploaded on each well of FTA cards.

Data statistical analytic and presentation: Data were analyzed and presented using PRISM Graphpad 8, numbers application for MAC 11, SPSS 16.0 and Microsoft exile 2010 the obtained data was checked for normal distribution by using Shapiro-Wilk test. A mixed-model analysis of variance (T-test) was used to compare the differences of mean among variable groups; the significance was tested using A mixed model (T-test) value less than 0.05 were considered statistically significant. Our data were presented as stander error mean ± (SEM).

Calculation of percentage rate: The equation for percentage calculation was used to calculate the percentage of infection and mortality rate in this study.

\[
\text{percentage} = \frac{\text{part of sample}}{\text{all sample numbers}} \times 100\%
\]

Result and Dissection

There is no vaccinated for Avian metapneumovirus & Ornithobacterium rhinotracheale in Iraq at this moment so, Therefore, the common vaccinations of broiler flocks as (ND, IB, IBD, Avian flu vaccinations) were relied upon to study their effect on the isolation rate for aMPV and ORT, the results were no significant difference between vaccinated flocks and non-vaccinated[12].

The reason due to there is no matching between the etiological local strain and commercial vaccine strain, which leads to a high probability of infection of the broilers flocks with infectious respiratory diseases or diseases that suppress the immune system, then leading to their susceptibility to infection with Avian metapneumovirus or Ornithobacterium rhinotracheale[13].

On the other hand, poor storage of vaccines and the wrong vaccination method leads to the ineffectiveness of the vaccine, which causes a high probability of infection the flocks with virus diseases to be vaccinated against it[14].

Conclusions

In infected poultry flocks that infected with ORT and aMPV were no significant different between vaccinated and no vaccinated flocks agents ND, IBD and IB this return to bad vaccination program in Iraq also due to un matching between the local strain and commercial vaccine that available in Iraq.

Ethical Clearance: The Research Ethical
Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** None

**Funding:** Self-funding

**References**


Comparative Analysis of Tumor Infiltrating T Cells and Serological Markers between MIBC and NMIBC Patients

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Abstract
Bladder cancer is considered as that of any type of abnormal growth arising from the tissues. It has a possibility to spread other part of the body. The study aimed to evaluate counts of tumor infiltrating immune cells (CD3 & CD8) and serum soluble Fas and Fas ligand concentrations and their comparison between MIBC and NMIBC. In this cross-sectional study a total of (23) patients with bladder cancer consist of (14) males and (9) females were included, their ages ranged from (26-82) years. The patients visited urological surgery unit in Hilla Teaching Hospital during the period (December 2018 to October 2019). Tissue biopsy and 3 mL of blood were taken from each included subject for evaluation of CD3 and CD8 in bladder tumor tissues by IHC technique, and serum levels in sFas and sFasL in by ELISA technique. The results showed both CD3+ TILs and CD8+ TILs in MIBC are significantly higher than those of NMIBC (P value <0.0001 for CD3, and P value = 0.001 for CD8). Serum levels of sFas and sFasL in MIBC are not significantly different from those of NMIBC (P value >0.05). It was concluded that CD3+ TILs and CD8+TILs counts were significantly affected by the muscular invasiveness of bladder cancers, whereas both sFas and sFasL levels were not.

Keywords: Bladder, MIBC, NMIBC, TILs, sFas, sFasL; Tumor Infiltrating; health.

Introduction
Generally, the main cause of tumor incidence is genetic changes. Many years of genetic analysis showed that there are about 1000 known genes-associated cancer, categorized into three types: (1) proto oncopgenes that include in normal cells, but any mutation in this type of gene affecting the normal cell division causing abnormal cell growth (2) Tumor suppressor genes (TSGs) that responsible for normal cell growth, so the alteration in these genes may lead to uncontrolled cell growth, and (3) DNA repair genes, which involved in fixing and repairing in any alteration or damage in DNA, so the mutation in these type of genes leading to cancer occurrence. Bladder cancer is considered as that of any type of abnormal growth arising from the tissues. It has a possibility to spread other part of the body. Symptoms comprise hematuria, and painful urination (dysuria), and low back pain. The most frequent type of CA bladder is transitional cell carcinoma (TCC); other types such as squamous cell carcinoma (SCC) and adenocarcinoma are less. Most CA bladder cases are urothelial carcinomas, divided into; about 75 percent are non-muscle invasive, and 25 percent are muscle invasive. Depending on the morphology, bladder tumors can be divided into papillary, solid, and mixed types. The papillary type is most frequent, particularly in non-muscle invasive bladder cancer (NMIBC), other than muscle-invasive bladder cancers (MIBC).

Immunohistochemistry (IHC) is the most common application of immunostaining that used for the detection of solid tumors. Immunohistochemical detection of CD103+ tumor infiltrating lymphocytes can be used as potentially prediction factor in diagnosis of...
urothelial cell carcinoma (UCC) of the bladder tissue\(^5\). However, there is a study validates the performance of cell detect as a urine-based assay to identify UCC in patients with history of bladder cancer. It relies on both color and morphology to differentiate between benign and malignant cells in cytology specimens\(^6\). Generally, tumors are closely associated with immunity system. Especially functional systemic and local immunity is required for the effective responses against tumors. In addition to an active engagement with cancer cells and tumor stroma, immune cells can be affected and are often found to be dysregulated in cancer patients\(^7\). Moreover, increased T cell tumor infiltration correlated with a better prognosis in most studies\(^8\). In cases of NMIBC, increased densities of several TIL subpopulations, including cluster of differentiation CD3+, CD4+, and CD8+ T lymphocytes, were associated with worse recurrence and survival\(^9\).

The study aimed to evaluate the counts of tumor infiltrating immune cells (CD3 & CD8), and serum soluble Fas and Fas ligand concentrations and their comparison between MIBC and NMIBC.

Material and Method

In this cross-sectional study a total of (23) patients with bladder cancer consist of (14) males and (9) females were included. Their ages ranged from (26-82) years. Case information for each patient has been taken from the report of the diagnosis which were: name, sex, age, and the diagnosed tumor type. The patients visited urological surgery unit in Hilla Teaching Hospital during the period (December 2018 to October 2019).

Included & Excluded Criteria: The enrollment standards of patients in this study comprised any patient who has recent bladder tumors diagnosed histologically. Patients with normal histological results after suspicion of bladder tumor, any patient who took chemotherapy, and any case with retrospective bladder tumor have been excluded.

Ethical Approval: Patients or their sons and/or first degree relatives (father & mother) were asked permission prior to take any specimen. In addition, the study concept was accepted by the Research Ethical Committee at the College of Medicine/University of Babylon.

Samples: After patient admission, the biopsies bladder tumors were obtained from the urological surgery unit. The biopsy was preserved in plastic tube container with 10 percent neutral buffered formalin (NBF), before processing for immunohistochemical testing, using paraffin embedding technique to build formalin-fixed paraffin-embedded (FFPE) blocks. Moreover, 3mL of blood were collected from each patient for serological evaluation by ELISA technique.

Method

Sample Processing for the IHC Staining Technique:

- The thickness of tissue section was 4 μm taken from blocks of paraffin embedded tissue on positive charge slides when the cutting by microtome.
- Incubations specimen on chargeable slide (slide with tissue) for at least 2 hours at 58- 60 °C in the oven.
- At deparaffinization steps, 3 containers with Xylene on which the tissues/slides immersed for 2 minutes for each containers respectively.
- Then the tissues/slides dipped in 3 jars with alcohol (ethanol), the first jars with 30% alcohol, the second jars with 70% alcohol and the third jars with 100% alcohol, for 2 minutes at each jar respectively, this is hydration step.
- The last steps, subjected tissues/slides in container with Immuno DNA Retriever Citrate and then this Retrieval container with slide put in water bath set at 95 - 99°C for 60 minutes. then washed the tissues/ slides 5 time with wash buffer
- Then the immunohistochemical staining technique was applied (Bio SB- USA).

Evaluation: In IHC technique, the brown colored reaction in the nucleus or cytoplasm was considered a positive reaction. The intensity positive stained cells was determined by modified method through taking a pictures for three fields of each section through digital camera connected to conventional light microscope (20X power), and further image analysis was done with the Image J software (version 1.46r, National Institutes of Health, USA) for each picture to count (CD3 or CD8) cells, then the mean value was calculated that represent the cells number per field for each section\(^{10,11}\). In concerning serological markers (sFas & sFasL) were evaluated through sandwich-ELISA technique (Elabscience-USA).
Statistical Analysis: Calculation of the comparative data through Software of Statistical Package for the Social Sciences (SPSS), version 26.0, to explain the differences of study parameters between MIBC and NMIBC. Independent t-test was used for analyzing the differences. Statistically, it is considered a significant difference when P value < 0.05.

Results

In the present study, there are 23 subjects of study group were diagnosed as bladder tumors. These tumors are subdivided into: 16 (69.5%) are non-muscle-invasive bladder cancers (NMIBC); and 7 (30.5%) are muscle invasive bladder cancers (MIBC). As shown in Table (1), the mean of CD3+ TILs in MIBC patients (323.5 cells/field ±19) is highly significant (P value < 0.001) higher than those of NMIBC (170±77.4). Similarly, mean of CD8+ TILs in MIBC patients (186±61.6) is significantly (P value = 0.001) higher than those of NMIBC (64.7±29.3), Figures (1, 2). Regarding to serum soluble markers as shown in Table (2), there is no significant difference in (P value > 0.05) in means of sFas concentrations between MIBC (3251 pg/mL ±295.8) and NMIBC (3182.5 pg/mL ±351.8); also there is no significant difference (P value > 0.05) in means of Fas Lconcentrations between MIBC (474.7 pg/mL ±167) and NMIBC (374 pg/mL ±142).

Table (1): Comparison of tumor infiltrating CD3+ and CD8+ T cells counts between MIBC and NMIBC.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>MIBC</th>
<th>NMIBC</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD3 cells/field</td>
<td>323.5±19</td>
<td>170±77.4</td>
<td>&lt;0.0001*</td>
</tr>
<tr>
<td>CD8 cells/field</td>
<td>186±61.6</td>
<td>64.7±29.3</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

*Represents a significant difference at p<0.05. Data are expressed as Mean±SD.

Figure (1): Bladder cancers slide with CD3 marker (20X Magnification Power): (A) CD3+ TILs in MIBCs. (B) CD3+ TILs in NMIBCs.

Figure (2): Bladder cancers slide with CD8 marker (20X Magnification Power): (A) CD8+ TILs in MIBCs. (B) CD8+ TILs in NMIBCs.
Table (1): Comparison of serum soluble Fas and FasL concentrations between MIBC and NMIBC.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>MIBC</th>
<th>NMIBC</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fas pg/mL</td>
<td>3251±295.8</td>
<td>3182.5±351.8</td>
<td>0.636</td>
</tr>
<tr>
<td>FasL pg/mL</td>
<td>474.7±167</td>
<td>374±142</td>
<td>0.196</td>
</tr>
</tbody>
</table>

*Represents a significant difference at p<0.05. Data are expressed as Mean±SD.

### Discussion

CD3+ TILs in bladder cancers are so important regarding to its protective role\[12\]. Saeed\[13\] mentioned that CD3+ TILs quantitation in bladder carcinoma with advanced progression stages of invasion is significantly higher than others with no muscular invasion, in agreement with the current study findings. Likewise, there is an indication was reported by Sjödahl et al.,\[14\], they mentioned that the general, immunological response focusing on CD3 & CD68 in bladder cancers with no muscular invasion are weaker than that with muscle invasion. Increasing ratio of T lymphocytes in MIBC may indicate to a good prognostic aspect, like the conclusion that increasing rate of tumor infiltrating T lymphocytes has a good protective consequence \[15\]. In contrast, there is a suggestion that the intratumoral T cells in bladder cancer are mostly accounted by T regulator cells, so it leads to suppression of immune cells of anti-tumor activity\[16\].

Similarly, in our study findings of increased tumor infiltrating cytotoxic T cells quantitation in MIBC tissues suggesting the rates of phenotypic T cells differs based on the degree of bladder tumor progression. The high densities of CD8+ TILs in invasive bladder cancers may indicates to a good prognosis and give a long survival rates, in agreement with that observed in invasive urothelial carcinoma, and the better prognostic aspect is associated with high CD8+ TILs quantity \[17\]. Also, regarding to muscle-invasive urothelial carcinoma was reported that the ratio of CTLs to T reg cells is correlated with the response to neoadjuvant chemotherapy (NAC), if the tumor infiltrating T reg cells ratio is higher than CD8+ TILs leads to unresponsiveness to NAC, and the good response was observed if the CD8+ TILs ratio is higher\[18\]. In NMIBC, there is no relation between CD8+ TILs counts and prognostic aspects, and observed that CD8+ infiltration is affected by the expression of fibroblast growth factor receptor 3 (FGFR3) tumor microenvironments, and high counts CD8+ TILs were observed in NMIBC with low expression of FGFR3\[19\]. Also, Mariathasan et al., \[20\] evidenced that TGF-β has a significant role to reduce the tumor infiltrating CTLs, and showed that using of anti-TGF-β antibodies facilitate the CD8+ cells diffusion into the tumor center.

Regarding to the serum soluble Fas, the current study results may indicate to that tumor invasiveness does not affect the serum levels of Fas, in agreement with Nonomura et al., \[21\] who articulated that sFas concentrations are not associated with tumor histological stages. But, Yang et al., \[22\] disagreed with our findings by showing soluble form of Fas concentrations in urine of advanced stages of urothelial cancer are significantly higher than those with early stages, and suggest that sFas with the VEGF protein in urine may provide an improvement in treatment and diagnosis.

Despite the non-significant difference of serum levels of FasLs, the high concentrations mean of sFasL in invasive bladder cancers may be resulted from the increasing malignant cells, as evidenced that sFasL has expressed by malignant transformed cells in bladder cancers \[23\]. In contrary, Bahria-Sediki et al., \[24\] showed the serum levels of sFasL in non-invasive bladder carcinoma are higher than that in invasive bladder cancers. This disagreement may be linked to the differences in ethnicity (Asian vs European), and measurements protocols.

### Conclusion

It was concluded that CD3+ TILs and CD8+TILs counts were significantly affected by the muscular invasiveness of bladder cancers, whereas there is no differences in both sFas and sFasL levels between MIBC & NMIBC.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** None

**Funding:** Self-funding
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Prevalence of Foreign Bodies in the Ear, Nose and Throat in Alramadi City

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Abstract

Background: Foreign body in ENT refers to an object which settles within head orifices which includes the ear, nose, or throat.

Aim: Compare the incidence of various Foreign Bodies in the Ear, Nose and Throat and the type of anesthesia required for removal in alramadi teaching hospital.

Method: This cross-sectional study was conducted on 100 patients who presented with complaints of foreign body insertion/impactionor ingestion in ear or nose or throat in alramadi teaching hospital.

Results: These cases comprised of 64 (64%) males & 36 (36%) females having male: female ratio= 1.77: 1. Out of all patients 56 (56%) presented with ear foreign bodies, 33 patients (33%) presented with nasal cavity foreign bodies, 11 patients (11%) presented with the throat (oropharyngeal/hypopharyngeal) foreign bodies. General anesthesia was required in 8 cases (8%) while the rest removed by senior house officers under supervision by ENT specialists or Consultants without GA.

Conclusion: Foreign bodies considered an important challenge to otolaryngologist especially in children who represented the most commonly affected age.

Keywords: Foreign bodies, Ear, Nose, Throat, health.

Introduction

Foreign body in ENT refers to any exogenous object present in ear, nose or throat. These FB may enter the orifices either accidentally or intentionally due to curiosity. FB problems may involve both children and adults with the predominance of children due to their immaturity or due to imitation of adults especially in case of cotton pads which used frequently by adults. Mental retardation also considered a risk factor and encountered more in adults. Most of the FB cases presented to the ER department or ENT out clinic. In general, FB can be divided into 2 main groups, either animated or in animated FB. Regarding the animated FB, these are most commonly involving the ear where the animal enters it during sleep on the ground. Animated FB including insects, flies or cockroaches may cause severe discomfort and even otorrhagia or TM perforation. In these cases, the animal should be killed before removal and this can be done by using alcohol or olive oil then remove it by suction, syringing or use of special instruments(1). Regarding the inanimated FB these can be divided into two main groups either organic or in organic and to hygroscopic (hydrophilic) or nonhygroscopic (hydrophobic) FB(2). Organic FB usually more dangerous if left in situ for a long period.
as it may induce an inflammatory reaction, so it should be removed as soon as possible. Organic FB includes bean, chickpeas, seed or any vegetable parts. Inorganic FB includes beads, toys, button battery or jewelry. FB in the upper airway should be removed urgently to avoid aspiration into the trachea or lower respiratory tract. Button battery considered a special entity as it can cause severe tissue damage and necrosis if left in place for hours due to the chemical substances released from it. FB, in general, can be removed either by syringing, suction or instrumentation and this can be done under local or general anesthesia according to the age of patients and their compliance.

**Patients and Method**

A descriptive cross-sectional study was done in ENT department, alramadi teaching hospital from August of 2018 to March of 2019 (7 months). This study included 100 patients presented to the ENT out clinic or ER complaining of foreign body insertion, ingestion or inhalation. The data collected included (patients’ age, sex, type of foreign body and the site of impaction, method of removal). nasal examination by Killian or thudicum speculum or usage of flexible nasopharyngoscope was done for those with nasal FB. Ear examination is done by otoscope for identification of FB while those with throat FB Flexible nasopharyngoscope done and plain lateral and AP view head and neck x-ray sometimes required.

**Result**

A total of 100 cases of foreign body inserted were included in the study. About (52%) of cases were children, aged less than 10 years. Age range (2 -72) year with mean =19 year. Out of 100, 64 (64%) were males & 36(36%) were females giving male/female ratio of 1.77: 1 (figure 1). The ears were the most common site of lodgment of foreign bodies (Table 1) this occurred in 56 (56%) patients followed by the nasal cavities in 33 (33%) and then throat (oropharynx & hypopharynx) in 11(11%) patients. General anesthesia was required in 8(8%) patients (table 2)which mostly included foreign bodies in hypopharynx and larynx while the rest removed without anaesthesia . The most common foreign bodies encountered include bead 46(46%), cotton 29(29%), fishbone 11(11%)(figure 2), insect 9(9%) (figure 3), battery button 4(4%), pomegranate seed 1(1%). (table 3)
Discussion

Foreign bodies considered as an important problem that may face the otorhinolaryngologist doctor from internship level to consultant level and this may be due to the challenge of how to deal with each case. FB include a variety of objects each of them required delicate skill in removal trials of removal by untrained persons add more difficult in removal by ENT doctors as they can cause more damage to surrounding tissue or push the FB to deep location.

This study shows the prevalence of FBs according gender, age, type, site and type of anesthesia used, out of (100) cases (52%) were children aged less than 10 years this result close to outcome of (El Taher) that found (76.4%) of 1,013 cases, (Kamran M) that found (70%) of 85 cases, (Adedeji TO) that found (62.3%) of 239 patients, (Parajuli R) that found (45.71%) of 70 patients, (Ray R) that found (61.8%) of 334 cases, (Chai CK) that found (60.1%) cases of 1,084. The increased incidence in children may be due to their curiosity to explore orifices, imitation to explore orifices, imitation may be due to their eye can cause more damage to surrounding tissue or push the FB to deep locati, increased incidence of ADH syndrome and absence of observation by parents due to being busy with social media and technology.

Also we found Male predominance was noted (64%) than comparable with result of (Muhammad et al 2017) which was 46 (54%), (Adedeji et al 2016) which was 132 males (55.2%), (Ibekwe MUJU) that was 94 males (51.93%), but incomparable with (Onyeagwara Ny) that observed a slight female preponderance by 70 (53%) of 132 cases. Although the male is a predominant higher percentage in female may be due to a variety of hair and body accessories which are formed from beads and small toys which mostly observed in females with FB impaction.

The ears were the most common site of lodgment of foreign bodies this occurred in 56 (56%) patients followed by the nasal cavities in 33 (33%) and then throat (oropharynx & hypopharynx) in 11 (11%) patients this coincident with earlier findings (Adedeji et al, 2016) which were Ear foreign bodies (68.7%), followed by nasal foreign bodies (20.9%) then throat (3.7%), but disagree with (Al Hussein et al 2017) which show Swallowed FBs were the most common (53.6%), followed by aural FBs (24.68%), nasal FBs (19%), and inhaled FBs (2.6%). In another study in India on adult and children aerodigestive tract foreign bodies, the nose was the least involved site (Kamath P). This difference from our study may be due to sampling size difference. Also we found that General anesthesia was required in 8 (8%) patients which mostly included foreign bodies in hypopharynx and larynx that agree with Muhammad et al (2017) which was 16 cases (18.8%), otherwise disagree with with Al Hussein et al (2017) were the majority of FBs removed under general anesthesia 554 (54.69%) that mostly due to swallowed FBs were the most commonly encountered (544 cases- 53.7%).

In this study the most common FBs in ear were bead (27%), cotton (22%) and insect (8%) while in nose were bead (19%), cotton (7%) and battery (4%) then the throat fishbone (11%) that comparable with Taiwo et al (2016) were ear bead 25 (15.2), cotton 45 (27.4), insect 17 (10.4), while in nose bead 15 (30), cotton 0 (0), battery 1 (2). then in throat fish bone 14 (5.9).

Conclusion

FB cases should be taken seriously as most cases occur in children and usually it is not easy to deals with them, despite this, fortunately, most of these FBs can be removed under LA especially in ear and nose compared.
to pharynx and larynx where FB removal may require GA due to patient intolerance and gag reflex. Advise the parent to watch their baby while they are playing with toys is necessary.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** None

**Funding:** Self-funding

**References**

Ultrasound Value in Diagnosis of Acute Appendicitis at Al-diwaniyah Teaching Hospital-Iraq

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Abstract

Background: Ultrasound has been widely available and usable imaging technique help in assessment and diagnosis of various diseases. The use of ultrasound as diagnostic tool for diagnosis of appendicitis has been established, but the real value of use of ultrasound not clearly observed, the aim of our study to clarify the negativity of the predictive value of ultrasound study for acute appendicitis (NVP).

Method: Ultrasound study of the abdomen with focusing on right iliac fossa done for 100 patient clinically suspected to have acute appendicitis and a scale of one to three given for sonographic results range from negative (score 1) to confirmed appendicitis (score 3), the result compared with the CT – scan finding and specimen pathology after surgical intervention.

Result: Seventy four (74) patient were negative by ultrasound, while twenty six (26) patient has score of 3 ultrasonic features of acute appendicitis, CT scan examination with contrast adding another ten (10) patient proved to have appendicitis (i.e changing from negative to positive appendicitis by CT findings) and fifteen (15) patient with other diagnosis or discharged, so total positive cases where thirty six (36) patients whom underwent surgical intervention, from those were thirty (30) patient confirmed appendicitis by pathological result (83%), So the negative predictive value for the ultrasound diagnosis of appendicitis (NVP = 95.1%).

Conclusions: Ultrasound had an overall lower sensitivity in diagnosing appendicitis in our study, but with high specificity, however, with various studies when the appendix was not clearly identified, CT-scan assessment should be considered.

Keyword: Appendicitis, ultrasound, diagnosis of appendicitis, sonographic assessment.

Introduction

A painful abdomen is common, acute appendicitis is the commonest suspected disease and must be differentiated from other pathology\(^{(1,2,3)}\). Although, the main points for diagnosis that patient commonly present with pain around the umbilicus which radiated to right lower abdomen, with nausea, vomiting, fever, leukocytosis with neutrophilia\(^{(4)}\). Imaging studies are much helpful in diagnosis when the clinical picture are not too clear, were studies support the use of ultrasound with/without CT- scan for confirmation of acute appendicitis\(^{(1,2,3,4,5)}\). Were the sensitivity of ultrasound ranging from (67% - 88%) and specificity about (78%-100%), while the sensitivity of CT-scan about (76%-96%) and specificity about (75% - 97%)\(^{(7,8)}\). The study aiming to assess the negativity of the predictive value of ultrasound study and if can be used for screening of acute appendicitis ..\(^{(10,12)}\)

Materials and Method

Study begin in Al-diwaniyah teaching hospital in the period between October 2018 and October 2019, were
100 patients complaining of clinical features of acute appendicitis seeking the surgical and radiological in-hospital clinic has been chosen randomly and included in our study, each ultrasound study done by specialist radiologist, were superficial and convex probe used. The examination focusing on region of right iliac fossa by using graded compression technique and viewed in longitudinal and transverse images, then a score of three points we depend upon to assess the clarify the possible available radiological findings, by which:

Score 1 (normal appendix, regarded as negative result)
Score 2 (appendix can't seen or minimal secondary signs of appendicitis like peri-cecral free fluid, or increment in the peri-cecral echogenicity with thickening of the fat of the mesentery and presence of faecolith or the size range from 5-6 mm, regarded as equivocal and need further assessment).
Score 3 (clear sonographic features of appendicitis like enlarged non-compressible appendix with diameter of 7 mm or more, regarded as positive result), as shown in figure (1). CT-scan with 2 ml/kg iodine based contrast media with 5mm axial imaging protocol for abdomen used, in some cases with abdominal pain more than one day, an oral contrast has been given also.

Fig 2 Criteria for positive acute appendicitis in CT-scan are an appendix diameter of the appendix exceed six millimeter, stranding of the surrounding fat stranding, wall enhancement of the tissue of the wall, and abscess around the appendix.

We correlate the radiological finding with surgical and pathological result with definitive diagnosis.

Statistics: The accuracy of diagnosis of ultrasound study was assessed by using the positive and negative predictive value, sensitivity and specificity and their respective, negative and positive likelihood ratios. The values regarded as estimated values and 95% confidence intervals.

Results

From the 100 appendicitis diseased complainers selected for study and undergo the ultrasonic examination, 74 patients had negative ultrasound scan, and 26 have positive ultrasound scan.

Those 100 patients then undergo CT scan with contrast for the abdomen/pelvis and changing the result of 10 patient from negative to positive i.e. with CT-scan the positive became 36 patients, and 64 patients negative or had another diagnosis.

Those 36 patients underwent surgical intervention and pathological assessment, from whom 30 patient were proved to have appendicitis and 6 patient were negative by pathology, so the sensitivity of ultrasound was (75%), specificity was (92%), positive predictive value (85%), CI (46.2%–74.4%) and the negative predictive value (NPV) about (95.1%).
Discussion

Acute appendicitis suspicion is regarded as one of the mysterious cases encountered in clinical medicine, diagnosis is mainly based on clinical practice, but sometimes the case can be missed.\(^{(13,17)}\)

Radiological imaging has a vital role in the updated assessment of appendicitis, although the best radiological assessment remains unclear.\(^{(19)}\)

The ideal imaging protocol should obey the following criteria which are availability, non-expensive, reproducibility, safety, fast test, and accurate one.\(^{(18)}\)

X-ray images findings are not precise, but the presence of appendicolith is diagnostic of appendicitis, however its present in less than (5%) of acute appendicitis.\(^{(19,20)}\)

Studies that use of sonography and CT-scan in the assessment of acute appendicitis focusing on the visualization rate of the appendix with clarifying the specificity and sensitivity of the study.\(^{(1,5,14)}\)

Ultrasound examination is helpful in assessment of female, to avoid radiation to feminity organs to exclude ovarian and uterine diseases that might resemble clinical picture of acute appendicitis.\(^{(21)}\)

In the study the diseases of the ovary and uterus with pain were found in 14 patients, or another diagnosis found \(^{(22)}\).

The most criterion for the diagnosis of appendicitis by ultrasound are the identification of a non-compressible blind-ending tubular structure in the region of the right iliac fossa with an outer diameter of more than six millimeter \(^{(23)}\).

Older researches suggested that to exclude acute appendicitis, a normal appendiceal structure should be recognize \(^{(24)}\).

The sonographic visualization rate varies greatly between hospitals, from about 98% to 22%.\(^{(10)}\) In our study, negative result mean non visualization of appendix and no other signs of appendicitis, depending on these principles, the NPV was about (95.15 %), is similar to results in older studies.\(^{(10,24)}\)

The indication of use of CT-scan after ultrasound study included non-visualization, non-conclusive visualization of secondary signs of appendiceal inflammation, or negative but still with associated suspicion for acute appendicitis.\(^{(10,12,24)}\)

The positive predictive value in the study was relatively lower than others \(^{(10,11,24)}\) which could be contributed the low pretest probability of the disease in our population\(^{(22)}\).

The retrospective design added a limitation to our study, as the examinations are highly depend on the operator. However, the study was supported by the using a rigorous exclusion protocol for acute appendicitis in our hospital.\(^{(19,20,21)}\)

Our conclusion, ultrasound was found to have a high negative predictive value (95.15 %) for the exclusion of appendicitis even when the appendix can-not be seen. The role of ultrasound use in young female is supportive especially to protect their reproductive organs from radiation of other modalities, which could be done when clinical status deteriorated or still highly suggestive of acute appendicitis.\(^{(14)}\)

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: None

Funding: Self-funding

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6. Gracey D, McClure MJ. The impact of ultrasound


Association of Syndecan 4 and Osteocalcin with Application of BMP2 and BDNF in Bone Healing of Osteoporotic Rats

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Abstract

Background: Bone tissue contains multipotent stromal cells, which have the ability to differentiate into different specialized cells. Induced stem cells have been developed with various growth factors using many biomaterials, which are the most common strategies in tissue engineering. Syndecan 4 and osteocalcin expressions during healing of bone defect in osteoporotic rat, along with the application of bone morphogenic protein 2 (BMP-2) and brain-derived neurotrophic factor (BDNF), were evaluated in this study.

Method: Ten normal rats and 10 induced osteoporotic rats were used in this study. Three mm bone defects were created in the femur of each rat, one on the left side and another one on the right side. The left bone defects were left to heal spontaneously without any application, while the right ones were treated with a combination of BMP2 and BDNF. Immunohistochemical evaluation was done for positive expression of syndecan 4 and osteocalcin in bone tissue during healing periods.

Results: Application of BMP2 and BDNF for both normal and osteoporotic rats increased the expressions of syndecan 4 and osteocalcin. In addition, expression of Syndecan 4 was decreased with increment period, while Osteocalcin expression showed the reverse. Statistical analysis revealed a significant difference regarding both positive expression of Syndecan 4 and osteocalcin in the treated groups compared to their untreated counterpart.

Conclusion: Application of BMP-2 and BDNF enhances syndecan 4 and osteocalcin expressions in bone repair of osteoporotic rat.

Keywords: BMP-2, osteoporosis, bone cells, bone healing, BDNF, Syndecan 4, Osteocalcin.

Introduction

Bone healing is a physiological proliferate process resulting in new bone formation that fills the hole or the fracture site¹.². Osteoporosis is a public health problem associated with an increased risk of bone fractures and it was thought to delay or impair the regenerative response³.⁴. In bone repair of osteoporotic animals, changes in the expressions of bone sialoprotein (BSP), alkaline phosphatase, osteopontin, osteocalcin and bone morphogenetic protein (BMP) were observed. Their decreased expressions have been found to delay healing of osteoporotic bone fractures⁵.⁶.

Combination of biomaterials with BMP2 and other growth factors, was reported in many advanced bone healing studies⁷.⁸. Brain-derived neurotrophic factor (BDNF) has an influence on bone innervation, and may modulate the proliferation or differentiation of

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the developing bone cells by acting as osteogenic and angiogenic factors. Syndecan-4 considered as the best plasma membrane proteoglycan and was found on cell surfaces of fibroblasts and epithelial cells. Osteocalcin is a vitamin K-dependent, bone-specific protein and considered as specific osteoblastic bone marker. Osteocalcin expression was observed during bone healing process at the periods when intense mineralization of the bone tissue occurs.

All those factors seem to be necessary and have important roles in bone healing. And because there are few studies concerning this field, therefore, current study was conducted to study the effect of local application of BMP-2 and BDNF with the expression of Syndecan 4 and Osteocalcin in repaired bone tissue.

**Method**

**Animal Models:** Twenty female Wistar rats, weighted 0.25-0.30 kg, aged 4-5 months were used and kept in the Animal Department of National Center of Drug Control and Research, Iraq at a constant humidity and temperature of 23°C. Animal care was furnished in accordance with the National Council’s guide. After 2 weeks of acclimatization, rats were randomly allocated to 4 groups as follows, normal rats with bone defect left to heal spontaneously (group A), osteoporosis-induced rats with bone defect left to heal spontaneously (group B), normal rats with bone defect treated with application of BMP-2 and BDNF (group C), and osteoporosis-induced rats with bone defect treated with application of BMP-2 and BDNF (group D).

**Induction of Osteoporosis:** Ten rats were anesthetized by ketamine and xylazine mixture. The skin area was shaved, washed using chlorhexidine scrub and ethanol 70% and disinfected by povidone iodine. Bilateral ovariectomy was carried out by single sagittal medial laparotomy process. Then, the rats received a daily intra-muscular injection of methylprednisolone hemi succinate (MPH) at dose (1 mg/kg) for 4 consecutive weeks.

Six weeks after ovariectomy, surgical bone defect was done. The rats were anesthetized generally with a mixture of 50 mg/kg BW ketamine and 2.5 mg/kg BW xylazine. Surgical technique was performed in rat femur to prepare two 3 mm-drill-holes, 1 hole on the left femur and another hole on the right. Same surgical procedure was also performed for normal rats. The holes on left femur were considered for the A and B groups of normal/osteoporotic rats. The holes left to heal spontaneously without any application, just washed with normal saline, dried gently and sutured. Meanwhile the right holes were considered for the C and D groups. The holes were treated with a combination of 0.5 microliter BMP2 (rhBMP-2, Medtronic Sofamor Danek, TN, USA) and 1 microliter BDNF (ab9794, Abcam, UK), dried gently and sutured. Determination of effective dose for BMP2/BDNF depends on previous studies.

The animals were sacrificed by an overdose of carbon dioxide gas after surgical operation at the 7th and 14th day. Bone holes along with their surrounding bones were excised with a surgical saw right away following the euthanasia. The excess tissue were dissected and the specimens removed with a 5–10 mm margin of surrounding bone. The specimens immediately were fixed into the 10% formaldehyde solution. Then, the specimens decalcified, dehydrated, embedded in wax and sliced in serial with 4-µm thickness.

**Immunohistochemistry:** Then immunohistochemistry was performed with polyclonal anti-Syndecan-4 (ab24511, Abcam, UK) and anti-Osteocalcin (OC4-30, ab13418, Abcam) antibodies. Positive peroxidase staining produced brown color on light microscopy. The percentages of positively stained cells were counted at 5 representative fields with (X40) magnification.

Immunohistochemistry results were quantified by counting the positive cell in each 100 cells in five fields (X40) of different sections. Then the mean and scoring of positive cells was estimated for each sample. The scoring was score 0, none; score 1, <10%; score 2, 10-50%; score 3, 51-80%; and score 4, >80%.

**Statistical analysis:** All records were entered into Excel spread sheets for evaluation with the Statistical package deal for Social studies (SPSS) (Chicago, IL, united states of America). The data were analyzed using one-way ANOVA test with multiple comparisons of LSD.

**Results**

**Syndecan 4 findings:** The immuno-reaction for Syndecan 4 and Osteocalcin illustrated an increment in their expression with application of BMP2 and BDNF for both normal and osteoporotic groups. Positive expression of Syndecan 4 illustrated by osteoblast, osteocyte in
normal group while in osteoporotic group the expression mostly observed in osteoclast, inflammatory cell and mesenchymal cell (Figure 1). On other hand, minimal decrease in the scoring recorded in the 14th day period in all groups in comparison to 7th day period, which revealed mostly, score two and three. Statistic results revealed a significant different value of positive expression of Syndecan in treated groups in comparison to those untreated, in both studied periods, (Table 1).

**Osteocalcin findings:** Osteocalcin expressed by osteoblast and osteocyte in all groups but an intense brown stain observed in groups (C & D) that treated with growth factors application (Figure 2). On other hand, the expression increased with period and recorded mostly, score 2 and 3 in the 14th day period in all groups except for group B (untreated osteoporotic) that showed score 1 in both periods. Statistical analysis revealed a significant different value for positive expression of osteocalcin in treated groups in comparison to those untreated, in both periods. Groups (A & C) revealed a non-significant difference in the 14th day period, (Table 2).

Table (1): Observed Frequencies of the Studied immunohistochemical scoring of Syndecan 4 in different groups by different (S.O.V.) with LSD

<table>
<thead>
<tr>
<th>Groups Score</th>
<th>7 Days</th>
<th>14 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score - 1</td>
<td>1</td>
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<tr>
<td>Score - 3</td>
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</tr>
<tr>
<td>Score - 4</td>
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</tr>
<tr>
<td>Groups Score</td>
<td>7 Days</td>
<td>14 Days</td>
</tr>
<tr>
<td>-------------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>Group B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score -- 1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
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<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Score - 3</td>
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<td>0</td>
</tr>
<tr>
<td>Score - 4</td>
<td>0</td>
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</tr>
<tr>
<td>Group C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score - 1</td>
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<td>0</td>
</tr>
<tr>
<td>Score - 2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Score - 3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Score - 4</td>
<td>1</td>
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</tr>
<tr>
<td>Group D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score -- 1</td>
<td>2</td>
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<tr>
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<td>Score - 3</td>
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<tr>
<td>Score - 4</td>
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LSD test

<table>
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<th>Sig.(*)</th>
<th>C.S.</th>
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<tr>
<td>7 day</td>
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<td>Group C</td>
<td>-0.81</td>
<td>0.610</td>
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<tr>
<td>7 day</td>
<td>Group B</td>
<td>Group D</td>
<td>-0.77</td>
<td>0.882</td>
</tr>
<tr>
<td>14 day</td>
<td>Group A</td>
<td>Group C</td>
<td>-0.23</td>
<td>1.310</td>
</tr>
<tr>
<td>14 day</td>
<td>Group B</td>
<td>Group D</td>
<td>-0.67</td>
<td>0.621</td>
</tr>
</tbody>
</table>

Group A= Normal; Group B=Osteoporotic; Group C=Normal with application; Group D=osteoporotic with application. P>0.05 non significant

Table(2) Observed Frequencies of the Studied immunohistochemical scoring of osteocalcin in different groups by different (S.O.V.) with LSD

<table>
<thead>
<tr>
<th>Groups Score</th>
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<th>14 Days</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
</tr>
<tr>
<td>Score - 1</td>
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<td>1</td>
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<tr>
<td>Score - 2</td>
<td>1</td>
<td>3</td>
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<tr>
<td>Score - 3</td>
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<td>1</td>
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<tr>
<td>Score - 4</td>
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<td>0</td>
</tr>
<tr>
<td>Group B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score - 1</td>
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<tr>
<td>Score - 2</td>
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<tr>
<td>Score - 3</td>
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<tr>
<td>Score - 4</td>
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<td>0</td>
</tr>
<tr>
<td>Group C</td>
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<tr>
<td>Score - 1</td>
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<tr>
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<tr>
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<tr>
<td>Score - 4</td>
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LSD test
### Discussion

The present results showed an increment of the expression of both Syndecan 4 and Osteocalcin in treated groups with local application of growth factors in comparison to untreated. These results could be attributed to the cooperation of many factors related to the presence of BMP2 which enhanced many events, including the differentiation of mesenchymal stem cells (MSCs) into osteoblast and the enhancement of angiogenesis\(^{18}\). The BMPs potently record to induce osteogenic differentiation\(^{6}\) and might be involved in the chemotactic recruitment of osteoblasts during new bone formation\(^{3}\). Moreover, BDNF has an effects on vascular endothelial growth factor (VEGF) that stimulated vascularization and promote bone formation\(^{19}\). A study revealed a delay in the healing process of osteoporotic rats in comparison to that in normal rats, where they detected disturbance of new bone formation accompanied with the reduction in bone resorption\(^{6}\). Other study used MBG particles loaded with BDNF filled fracture gaps in osteoporotic mice. The study showed increase in bone formation, and reported that this growth factor (BDNF) appears as potential drug suitable to stimulate bone formation during fracture healing in osteoporosis\(^{20}\). In the present study, the application of the growth factors seem to play an effect on the activity of cells related to bone healing, specifically in the osteoporotic rats that had a defects in differentiation, vascularization and in expression of many proteins including syndecan-4 and osteocalcin\(^{21}\).

Furthermore, in the present results, the local application of combined BMP-2 and BDNF, might act as a bioactive molecules, stimulating bone cell proliferation that resulted in an increment of expression of Syndecan-4, specifically in the 7\(^{th}\) day (the time of bone apposition). Moreover, an increment of Syndecan-4 enhanced the interaction of involved cells with the extracellular matrix, anticoagulants, and other growth-factors which activate cell adhesion and cell migration, and then enhance bone healing\(^{22,23}\). A study revealed that Syndecan-4 contains binding sites for various proteins, growth factors, and cytokines. In addition, it is involved in the influence bone structure and fracture healing\(^{12}\).

Osteocalcin considered as a marker of osteoblastic activity and specific marker of bone metabolism, therefore, the present results detected the expression of osteocalcin in osteoblasts and osteocytes. These cells may play a role in the remodeling of extracellular matrices with expression of syndecan 4 during healing of the bone defect. Osteocalcin expression observed to be increased in the 14\(^{th}\) day, the period of mineralization of bone tissue during healing process\(^{24,14}\). A study observed that at seven days neo-formed trabeculae bone labelled with a small quantity of osteocalcin, while at 14 days a larger quantity of deposited trabeculae bone with higher osteocalcin values were recorded, our results were compatible with these findings\(^{25}\).

### Conclusions

Local application of BMP-2 and BDNF enhanced both the expression of syndecan-4 and osteocalcin of osteoporotic rats.

**Acknowledgment:** This work supported by Prof. Dr. Hasan Majdi, Dean of Al-Mustaqbal University College, Babylon, Iraq.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** None

**Funding:** Self-funding

### References


Urinary and Serum N-acetyl B-Glucosaminidase as Biomarkers of Albuminuria in Patients with Type 2 Diabetes

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¹Post Graduate, ²Assist. Prof., Department of Chemistry and Biochemistry; College of Medicine, AL-Nahrain University, Iraq

Abstract

**Background:** Diabetic nephropathy is a serious kidney-related complication of type 1 diabetes and type 2 diabetes. It is also called diabetic kidney disease. About 25% of people with diabetes eventually develop kidney disease. The enzyme N-Acetyl-β-glucosaminidase (NAG) (EC: 3.2.1.30) is one of lysosomal acid hydrolases enzyme present in many body tissues with a high molecular weight (~ 140 kDa). It breaks chemical bonds of glycoside and amino sugars which form structural components in many tissues. Different pieces of cells need to be degraded and disposed of, including the cell membrane.

**Method:** By using ELISA kit, we measured urine and serum level of N-acetyl B-Glucosaminidase in 30 patients diabetes with Microalbuminuria: ACR: <30 mg/g, 30 patients diabetes with Macroalbuminuria: ACR>30 mg/g with 30 healthy volunteers enlisted as normal controls.

**Result:** Urine concentration of NAG in macro and micro- groups was comparable (13.23±1.04 ng/mL and 13.1±1.46 ng/mL, respectively) with no significant difference, while both groups showed highly significant difference compared with normo- group (5.15±2.11 ng/mL) On the other hand, serum concentration of NAG in normo- micro- and macroalbuminuria was 1.2±0.3 ng/mL, 2.5±0.58 ng/mL and 3.2±0.77 ng/mL, respectively, with highly significant differences between the three groups.

**Conclusion:** N-Acetyl-β-Glucosaminidase: the present study, diabetic nephropathy was associated with elevated urinary and serum NAG values compared to a control group. This increase in NAG was parallel to the severity of renal involvement with a characteristic increasing trend was observed among the study groups regarding albuminuria.

**Keywords:** N-Acetyl-β-Glucosaminidase, diabetes mellitus, diabetic nephropathy, ELISA.

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Introduction

Diabetes mellitus is a metabolic disorder or may be described as a diverse group of diseases with different causes. Worldwide, cancer ranks second and diabetes mellitus ranks twelfth in the list of causes of death.

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¹, It is a chronic disease that affects approximately 26.9 percent of the U.S. population aged 65 years and older. 1.9 million diabetics are diagnosed each year, in addition to 7.0 million undiagnosed and untreated. The diagnosis of diabetic patients should be based on the following: • HbA1c check with a limit of ≥ 6.5 per cent. Fasting blood Glucose (FBG) ≥ 126 mg / dL. or Glucose Tolerance Test; plasma glucose levels ≥ 200 mg / dL after two hours of consumption of 75 g glucose. Untreated diabetic patients have chronic hyperglycemia, i.e. higher than normal blood glucose levels. The cause for this is either a low level of insulin (a polypeptide hormone secreted by the pancreatic beta cell), an unusual form of insulin, or both.
Diabetic nephropathy is a diabetes-complicated kidney disease. It can occur in people with type 2 diabetes, the most common form of diabetes caused by insulin resistance, or in people with type 1 diabetes, the type that begins earlier and results from reduced insulin production. The damage to the smallest blood vessels causes diabetic nephropathy. Both kidneys start to leak proteins into the urine when small blood vessels begin to develop damage. The kidneys slowly lose their ability to remove waste products from the blood as damage to the blood vessels persists. The enzyme N-Acetyl-β-glucosaminidase (NAG) (EC: 3.2.1.30) is one of lysosomal acid hydrolases enzyme present in many body tissues with a high molecular weight (~ 140 kDa). It breaks chemical bonds of glycoside and amino sugars which form structural components in many tissues. Different pieces of cells need to be degraded and disposed of, including the cell membrane. NAG present in the lysosomes of the proximal renal tubular cells at high concentrations. There are two main isoenzymes in the kidneys of humans. Isoenzyme-A is part of an intralysosomal compartment that is excreted by exocytosis in the urine. Isoenzyme-B is associated with the lysosomal membrane and excreted during tubular damage in urine. These two enzymes vary in their heat tolerance and in acid urine stability. Because of its urine stability, its relatively large molecular mass that prevents glomerulus filtration and its involvement in high tubular lysosomal activity, elevation of urinary NAG activity has been taken as a marker for renal proximal tubular damage or more precisely loss of lysosomal integrity.

The aim of the present study was to evaluate urine and serum level of in patients with Diabetic nephropathy, and compare this group with control healthy group as well as to investigate whether it can be used as a biomarkers for detection of diabetes.

Materials and Method

Study design case control study: The present study was executed during the term from August 2019 to November 2019. This study included 60 patients with diabetic nephropathy and 30 healthy controls. Group I consist of 30 patients with Microalbuminuria: ACR: <30 mg/g Group II consist of 30 patients with Macroalbuminuria: ACR>30 mg/g Groups III Consist of 30 of matched healthy subjects were used as control ACR <20 mg/g. All samples were collected from Medical City of Baghdad Teaching Hospital. About 6 ml of blood samples were obtained from veins of patients having diabetic nephropathy and healthy control subjects. The 6 milliliters of blood were left for 15 minutes at room temperature. After coagulation, sera were separated by centrifugation at 3000 rpm. for 10 min. Sera were aspirated and divided into small aliquots for:-Immediate measurements of serum total protein, albumin, creatinine, blood urea, blood glucose, uric acid were done using appropriate method. The rest were stored at -20 C° until assayed They were measured using enzyme-linked immunosorbent assay (ELISA) kits. Ten milliliters of urine were obtained from patients and healthy children, and then collected in the plane were centrifugation at 1000x g for approximately 10 minutes.

Statistical Analysis:
- In this study the data obtained was analyzed by Microsoft excel 2010 and SPSS version 23.
- The numerical data expressed as mean ±SD.
- Student’s t-test was used to calculate individual p-value, p-value < 0.05 was considered significant.

For comparing mean of more than two groups the ANOVA was used.

Result

Demographic and Clinical Characteristics of the Study Population: The mean age of patients with normo-, micro- and macroalbuminuria was 42.3±3.25 years, 42.93±3.03 years and 44.8±4.28 years respectively with no significant difference. Similarly, there were no significant differences between the three groups in gender distribution, type of therapy and BMI. However, DM duration was significantly longer in macro (8.77±4.2 years) group than normo- group (5.63±4.96 years).
Table 1: Demographic and Clinical Characteristic of the patients

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<th>Normo (30)</th>
<th>Micro (30)</th>
<th>Macro (30)</th>
<th>P-value</th>
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<td>Age, years (Mean±SD)</td>
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<td>42.93±3.03</td>
<td>44.8±4.28</td>
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<td>Sex, No(%):</td>
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</tr>
<tr>
<td>Male</td>
<td>14(46.67%)</td>
<td>15(50%)</td>
<td>19(63.33%)</td>
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<td>Female</td>
<td>16(53.33%)</td>
<td>15(50%)</td>
<td>11(36.67%)</td>
<td></td>
</tr>
<tr>
<td>Duration, years, (Mean±SD)</td>
<td>5.63±4.96</td>
<td>7.67±4.36</td>
<td>8.77±4.2</td>
<td>0.028</td>
</tr>
<tr>
<td>Therapy, No(%):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral</td>
<td>18(69.70%)</td>
<td>22(73.53%)</td>
<td>23(76.67%)</td>
<td>0.329</td>
</tr>
<tr>
<td>Insulin</td>
<td>12(30.30%)</td>
<td>8(26.47%)</td>
<td>7(23.33%)</td>
<td></td>
</tr>
<tr>
<td>HbA1c% (Mean±SD)</td>
<td>7.32±1.12</td>
<td>9.18±1.79</td>
<td>10.22±1.72</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>BMI, kg/m², (Mean±SD)</td>
<td>26.78±1.17</td>
<td>28.09±2.64</td>
<td>27.84±3.6</td>
<td>0.219</td>
</tr>
<tr>
<td>Glucose, mg/dl (Mean±SD)</td>
<td>100.73±13.89</td>
<td>163.83±21.5</td>
<td>177.03±24.75</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>TSP Mean±SD)</td>
<td>74.43±3.41</td>
<td>71.5±3.01</td>
<td>70.73±4.27</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Albumin</td>
<td>41.97±2.04</td>
<td>39.4±2.79</td>
<td>39.7±3.14</td>
<td>0.001</td>
</tr>
</tbody>
</table>

BMI: body mass index, SD: standard deviation

**Different small letters indicate significant differences:** Both HbA1c and FBS were significantly higher in macro group (10.22±1.72% and 177.03±24.75 mg/dL, respectively) than either normo- (7.32±1.12% and 100.73±13.89 mg/dL, respectively), or micro-group (9.18±1.79% and 163.83±21.5, respectively). In contrast, normo- group showed higher serum TSP and albumin (74.43±3.41 mg/dL and 41.97±2.04 mg/dL, respectively) than either micro- (71.5±3.01 mg/dL and 39.4±2.79 mg/dL, respectively) or macro- group (70.73±4.27 mg/dL and 39.7±3.14 mg/dL, respectively) with highly significant difference (Table 1).

**Urine and Serum Concentrations of NAG:** Urine concentration of NAG in macro and micro- groups was comparable (13.23±1.04 ng/mL and 13.1±1.46 ng/mL, respectively) with no significant difference, while both groups showed highly significant difference compared with normo- group (5.15±2.11 ng/mL) as shown in figure 3-1. On the other hand, serum concentration of NAG in normo- micro- and macroalbuminuria was 1.2±0.3 ng/mL, 2.5±0.58 ng/mL and 3.2±0.77 ng/mL, respectively, with highly significant differences between the three groups (Figure 3-2).

![Figure 1: Urine concentration of NAG](image-url)
Discussion

N-Acetyl-β-glucosaminidase: The present study, diabetic nephropathy was associated with elevated urinary and serum NAG values compared to a control group. This increase in NAG was parallel to the severity of renal involvement with a characteristic increasing trend was observed among the study groups regarding albuminuria. These results are in agreement with other studies (9) that stated that changes in urinary and serum NAG activity can reflect the activity of the disease as well as the residual functional capacity of the kidney. Our results showed that even in the absence of any clinical evidence of microvascular complications, urinary NAG excretion was invariably elevated indicating that subclinical renal tubular dysfunction may exist before the occurrence of glomerular damage. Kuzniar et al. (2006) denoted that in proteinuric glomerular diseases the increased NAG excretion can occur even in absence of morphological evidence of tubular cell damage, probably reflecting increased lysosomal activity of these cells due to the increased uptake of filtered proteins. Physiologic increases in urinary NAG for metabolizing urinary glucose and the nephrotoxic effect of glycated end products on renal proximal tubules could be possible. NAG is an enzyme involved in carbohydrate metabolism. When the proximal tubules are exposed to high urinary glucose, NAG might be secreted more in the urine, depending on urinary glucose concentrations. In addition, the peptides derived from advanced glycation end products might have a potential nephrotoxic effect on the proximal tubule, thus contributing to the occurrence of proximal tubule injury.

Conclusion

The cutoff value of urine and serum NAG high levels of NAG between groups compared with controls. This difference is useful for distinguishing between study groups.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: None

Funding: Self-funding

References


Impact of Dyslipidemia and Body Mass Index (BMI) in Development of Osteoarthritis (OA) in Iraqi Patients

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Abstract

Objectives: Osteoarthritis is a widespread degenerative defect of the articular cartilage connected with hypertrophic bone changes. Worldwide, obesity is one of the most common risk factor for such disorder. Current study was designed to investigate effect of this factor in Iraqi OA patients. Subjects and method: Total of 75 volunteers were enrolled in this study (50 patients and 25 subjects as controls). BMI and lipid profile were measured for each subject.

Results: Our study showed significant elevations (p value< 0.05) in each of cholesterol, TG, LDL, and VLDL as well as in BMI while showed nonsignificant difference in HDL in OA patients compared to healthy individuals.

Conclusion: Obesity and disturbance of lipid profile may play substantial roll in development of OA in Iraqi patients.

Keywords: Osteoarthritis, cholesterol, TG, LDL, VLDL, HDL, BMI, Iraqi patients.

Introduction

As the most prevalent chronic, varied, and dampen arthritic disorder, osteoarthritis (OA) fundamentally effect diarthrodial joints[1-4]. Life style can be affected negatively by osteoarthritis[5]. The OA incidence ranged from 3.8-70% worldwide[6]. In Iraq, Syria, Saudi Arabia, and Yemen about 1 million people are affected by OA [7]. In man gender OA was more common than women,however in females beyond 50 are affected by OA more than man at same age[8]. Typically, OA supposed to be due to aging and obesity[9]. Accumulated studies deals with the connection of obesity and metabolic syndrome with development of OA[10-12]. Epidemiological and experimental studies propose that the biological mechanisms implicated in the progression of OA could be linked to the lipid metabolic pathway has been well studied[13-15]. On the other hand, obesity and Overweight are independently associated with elevation of OA incidence [16-18]. This condition may be due to releasing of adipokines by adipose tissue[13].

Weighted study reported that lipid disturbances may be implicated in OA pathology[19]. However, few studies have deals with the relation between OA and dyslipidemia. Current study aimed to investigate if serum lipid profile is correlated with development of OA in Iraqi community.
Subjects and Method

This study was conducted in Haditha general hospital (from July 2019 to August 2019) in Rheumatology & Rehabilitation Consultation Department). Seventy-five unrelated volunteers were enrolled in current study, 50 patients (58.2±8.1 years) from both gender proved with osteoarthritis and 25 apparently healthy (57.2±7.9 years) as control group. Body Mass Index \( [\text{BMI} = \text{weight (kg)}/\text{square height (m}^2\text{)}] \) were recorded and venous blood (after 12 hours fasting) serum were collected from each participant. Using biochemical kits, lipid profile tests (cholesterol, TG, HDL, LDL, VLDL) were done for each sample. The current study was approved by Research Ethical Committee of College of Medicine/AL-Nahrain University. All the participants were provided with written informed consent to enroll in this study.

Statistical analysis: Using software of SPSS program (version 20) collected data were analyzed. Student’s t-test was used to match means of lipid profile factors between cases and control. Concentrations of measured markers expressed as \( \text{(Mean±Standard error)} \). Significance in all tests was set at 0.05 \( (P \leq 0.05) \).

Results

The result of present study \( \text{(Mean±SD)} \) showed significant dropping \( (p \text{ value <0.001}) \) of body mass index \( \text{(BMI= kg/m}^2\text{)} \) in patients group \( (30.89±5.88) \) compared to control group \( (30.89±5.88) \) (Fig. 1).

![Body Mass Index](image)

**Figure 1:** Histogram showing body mass index in patient and control groups.

While, results \( \text{[Mean±SD(mg/dl)]} \) of lipid profile in patients with OA showed significant elevation in each of cholesterol \( (198.0±41.7, \text{p value=0.001}) \), TG \( (144.42±55.56, \text{p value=0.024}) \), LDL \( (113.84±36.44, \text{p value<0.001}) \), and VLDL \( (28.9±11.11, \text{p value= 0.024}) \) compared to levels in control group \( (162.76±30.71), (116.28±30.8), (80.83±28.9), (23.26±6.16)\) respectively. On the other hand, level of HDL \( (55.28±10.98) \) showed non-significant difference \( (p \text{ value 0.238}) \) compared to control group \( (58.68±11.55) \) (Fig. 2).
Figure 2: Histogram showing lipid profile in patients with OA and control. TG: triglycerides, HDL: high density lipoprotein-cholesterol, LDL: low density lipoprotein-cholesterol, VLDL: very low density lipoprotein-cholesterol.

Discussion

Our study showed significant elevations in each of cholesterol, TG, LDL, and VLDL as well as in BMI while HDL showed non-significant difference in OA patients compared to control group.

In massive study Garcia-Gil et al suggested that elevated levels of HDL manifest to keep against OA, also they found an opposite relationship between levels of HDL cholesterol and the incidence of OA while levels of TG showed significant tendency, moreover LDL levels showed no relation with OA[20].

In cross-sectional study by Hart et al found significant relationship between OA and elevated TC while no relation between OA and elevated concentrations of LDL, TG, or HDL [21]. Other studies reported contradictory results regarding relationships between LDL, TG, TC, and incidence of OA. Dahaghin et al showed no relation between TC/HDL ratio and OA[12].

Mechanisms of lipid metabolism may be lead to development of OA still need for massive studies. There is proof that elevated levels of HDL in the synovial fluid have significant protective action [22], vascular injury affecting the bone marrow following to the cartilage, and the toxic action of cholesterol at the joint may be contribute to the progression of OA[23].

In study to seek the incidence of dyslipidemia in OA patients Pauline et al reported that increasing of dyslipidemia was two folds with OA than without OA[24]. Moreover, in pathophysiological study carried by Visser et al suggested that correlation between metabolic syndrome (MetS) and OA may be due to effects of adipose tissues as source of proinflammatory factors as well as effects of visceral fat[25]. Coggon et al reported that there is significant positive correlation between BMI and OA, this result consent with other current study[26]. Also, Grundy and Barnett reported that obesity is associated with several deleterious changes in lipid metabolism, including high serum concentrations of total cholesterol, LDL, VLDL and TG, and reduction in serum HDL concentration[27]. In study conducted on such disease Jeppesen et al demonstrate the interaction between TG and total cholesterol or HDL[28].

In study to investigate the relation between BMI and dyslipidemia Palou et al reported the significant relationship between BMI and serum lipid profile, their results showed that in all age groups, HDL levels were significantly lower in patients who had a high BMI[29]. Furthermore, Rosenson et al showed that hypertriglyceridemia is often associated with reduced levels of HDL suggesting a possible metabolic interaction between these two lipid fractions[30].
On the other hand, Ginsberg and Stalenhoef reported that relation of fat deposition in obese individuals is associated with insulin resistance, leading to increase synthesis of TG-rich lipoproteins in the liver[31]. Other study showed that increase of TG in lipid particles changes their metabolism, TG-rich HDL particles are hydrolyzed more rapidly causing HDL level to fall [32].

Mohiti and Qujuq showed that circulating lipid profile levels appear to be one of the best biological markers of obesity and hyperleptinemia is closely associated with several risk factors related to obesity syndrome[33].

Indeed, a decrease in BMI is accompanied by significant reduction in serum lipid profile levels leading to improved lipoprotein profile [34]. Brandt et al suggested that OA is a mechanically induced disorder in which the consequences of abnormal joint mechanics provoke biological effects that are mediated biochemically through local or systemic factors [35]. Accumulated evidences support our results and revealed that OA have significant relation with dyslipidemia and obesity.

**Conclusion**

BMI and dyslipidemia may play substantial roll in development of OA in Iraqi patients.

**Acknowledgments:** My greatest appreciation to all staff members Chemistry and Biochemistry Department and medical research unit/College of Medicine/Al-Nahrain university for their help and cooperation.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

**References**


Congenital Diaphragmatic Hernia:  
A Single Center Experience Over Seven Years

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Abstract

The congenital diaphragmatic hernia (CDH) is a birth defect in the fetal diaphragm allowing abdominal contents to protrude to the thoracic cavity. Presence of abdominal contents in the thoracic cavity will affect the respiratory reserve leading to respiratory symptoms mainly tachypnea. Congenital diaphragmatic hernia can be presented alone or with other congenital anomalies including cardiac, respiratory, or other anomalies. CDH can be classified as Bochdaleck, or Morgagni hernia. In 75% of cases CDH is on the left side. The aim of this study is to view the management of patients with CDH in terms of diagnosis, treatment, and survival rate. Forty-six cases were studied over seven year period from January 2012 till January 2018. They were diagnosed based on clinical examination, radiological investigations. 18 (39%) cases were 2-7 days of age. 29 (63%) of cases were presented with tachypnea. Bochdaleck’s CDH is found in 44 patients (96%). 18 patients (39%) were having pulmonary hypoplasia as an associated anomalies with CDH, such anomalies affect the pulmonary reserve by putting the child in a danger of pulmonary hypertension. Treatment was via surgical repair done by team of thoracic and pediatric surgeons. In this study, we found delaying surgical repair after stabilizing the respiratory reserve leads to good postoperative survival, this was proved by high mortality rate (8 patients 67%) in patients with less than 24 hours age. The aim of this study is to show the way of management of congenital diaphragmatic hernia in terms of diagnosis, treatment, and the survival rate.

Keywords: Congenital diaphragmatic hernia (CDH), Congenital anomalies, Bochdaleck’s CDH, Morgagni’s CDH.

Introduction

The diaphragm is the muscular structure that separate the thoracic cavity from the abdominal cavity and it is essential for the respiratory process, any birth defects in this muscular structure will lead to respiratory insufficiency due to herniation of the abdominal contents up into the thoracic cavity in a spectrum of congenital anomaly known as congenital diaphragmatic hernia. It has been found that genetic and environmental factors play a role in the pathogenesis of this anomaly; nevertheless, still pathogenesis is not well understood.(1)

Congenital diaphragmatic hernia (CDH) is a relatively common malformation in which there is failure of complete fusion of the diaphragm during the prenatal period. This leads to protrusion of abdominal organs into the thoracic cavity which can result in lung hypoplasia and respiratory failure at birth. Anatomically, CDH can be classified as postero-lateral (Bockdalek, 70–75%), anterior (Morgagni, 23-28%), or central (2-7%) defects.(2)

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In about 75% of cases CDH can be presented in the left side leading to the possibility of herniation of the small, or large bowel, the stomach, the spleen, the left lobe of liver, or rarely the kidney. CDH on the right side can include the right lobe of the liver, the possibility of the bowel and/or the kidney. (3) CDH occurring bilaterally is a rare presentation. (4)

The classical presenting symptoms are respiratory distress in terms of tachypnea, dyspnea; reluctant for feeding; and failure to thrive. The diagnosis is clinical and radiological. Surgical correction still the treatment of choice for CDH. The survival depends primarily on the severity of pulmonary hypoplasia, and the amount of fixed pulmonary hypertension, and secondly on the severity of associated anomalies. (5)

The aim of this study is to show the way of management of congenital diaphragmatic hernia in terms of diagnosis, treatment, and the survival rate.

Patients and Method

This study was carried out prospectively including forty-six children who admitted to Al-Kadhymiya Teaching Hospital with congenital diaphragmatic hernia which were proved by imaging studies (chest x-ray, Barium meal, and chest CT-scan) over a period of seven year from January 2012 to January 2018. Nine children died preoperatively despite optimal respiratory ventilator support, they were excluded from our study. Forty-six children underwent surgical correction of congenital diaphragmatic hernia. Once patients with CDH received in our outpatient unit, full investigations underwent in terms of blood investigations, radiological studies confirming the CDH and any associated anomalies; then the planning for surgical repair is ensured. The surgery is performed by an abdominal subcostal approach, the herniated abdominal viscera are reduced, and the diaphragmatic defect is inspected for the presence of any sac that should be excised. The defect then closed by interrupted sutures in case of small ones, and synthetic patches are used to close the defects in large ones. Post operatively, child is followed up in terms of respiratory failure, and mortality.

Results

Age Distribution: The majority of cases (18 cases) 39% were in their first week of age, while only (2 cases) 4.5% were more than first year of age. As shown in the graph below.

Clinical Presentation: Clinically, (29 cases) 63% with CDH were presented having tachypnea, only (12 patients) 26% presented with cyanosis. The gastrointestinal symptoms as vomiting, constipation, and abdominal distension were in (2 patients) 4.5% only. As shown in the table below.
Table No. (1) : Clinical presentation of patients with CDH

<table>
<thead>
<tr>
<th>Presentation</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tachypnea</td>
<td>29</td>
<td>63%</td>
</tr>
<tr>
<td>Cough (respiratory infection)</td>
<td>27</td>
<td>58%</td>
</tr>
<tr>
<td>Reluctant to feeding</td>
<td>23</td>
<td>50%</td>
</tr>
<tr>
<td>Cyanosis</td>
<td>12</td>
<td>26%</td>
</tr>
<tr>
<td>Gastrointestinal symptoms (vomiting, constipation, abdominal distension)</td>
<td>2</td>
<td>4.5%</td>
</tr>
</tbody>
</table>

Chart No. (1) : Types of congenital diaphragmatic hernia.

Type of congenital diaphragmatic hernia:

- Bochdaleck’s hernia is found in 44 patients (96%), the majority (38 patients) 83% is on the right, and (6 patients) 13% are on the left. While Morgagni type of CDH is in 2 patients only (4%). As we can see below in the Pie chart.

**Associated anomalies:** There are many congenital anomalies associated to congenital diaphragmatic hernia. The most common associated anomalies are pulmonary hypoplasia (18 cases) 39%, congenital heart disease is in (11 patients) 24%. See table no. 2

Table No. (2) Associated congenital anomalies in patients with congenital diaphragmatic hernia.

<table>
<thead>
<tr>
<th>Type of congenital anomaly</th>
<th>No.</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulmonary hypoplasia</td>
<td>18</td>
<td>39%</td>
</tr>
<tr>
<td>Congenital heart disease</td>
<td>11</td>
<td>24%</td>
</tr>
<tr>
<td>Malrotation of gut</td>
<td>9</td>
<td>19.5%</td>
</tr>
<tr>
<td>Renal anomalies</td>
<td>3</td>
<td>6.5%</td>
</tr>
<tr>
<td>Meckel’s diverticulum</td>
<td>1</td>
<td>2%</td>
</tr>
</tbody>
</table>

Age related survival and mortality: The survival rate is found to be high in patients aged 2-7 days, while a high mortality rate is found in patients below 24 hours age. As seen below.

Graph No.(2) : Age related survival in patients with congenital diaphragmatic hernia.
Congenital diaphragmatic hernia is a birth defect, can be presented as a sole birth defect or associated with other congenital anomalies. In our study, the frequent age of presentation was in the first week of life followed by neonates of less than 24 hours age, while an age of more than one year of age was the least frequent age of presentation. Such figures in our study may be due to lack of proper referral protocol to our pediatric surgical unit. Previously, there was a belief of early surgical repair for CDH as early as possible; now with the presence of advanced respiratory and ventilatory resuscitation delaying the surgical repair increase survival rate allowing time for relaxation of pulmonary vasculature,(6) this is what found to be in our study surgical repair in older age group reflected in lower mortality rate.

In the recent study, the survival rate is found to be higher with higher age group, these results goes with Tracy E. T. et.al study.(7)

The predominant clinical presentations in our study is respiratory symptoms and signs, like Beck C, et.al study (8)

In regards to the anatomical typing of CDH, the Bochdaleck’s type was the predominant one in 44 patients (96%); out of these only 6 patients (13%) were on the left while the rest 38 patients (83%) were on the right side, these results are not the same as Le, E. D. et.al study (9) the reason for this is the limited number of our patients in a relatively short period of time.

We found that pulmonary hypoplasia is a key factor influencing the survival rate for patients by causing pulmonary hypertension, it present in 18 patients (39%), the same as Pandya KA, et.al study.(10)

There was a belief that early surgical correction is the key in managing patients with CDH, but with time it was found that respiratory stabilization is the key is ensuring high survival rate among CDH patients’. In our study the mortality rate was high among patients aged less than 24 hours (8 patients 67%), so delaying the surgery leads to high survival rate after respiratory stabilization. Its goes with other studies Fallon SC, et.al. (11) and Kumar VSH (12).

**Conclusion**

Congenital Diaphragmatic Hernia is a congenital pathology with major health problem, posing a high mortality rate if not diagnosed and managed properly. In our center, despite the limited facilities and capabilities but still have a fair experience in managing such pathologies. We recommend early prenatal diagnosis, genetic diagnosis, and proper postnatal care via the
establishment of well-established neonatal intensive care units (NICU), the availability of extracorporeal membrane oxygenation (ECMO) to provide a proper respiratory support, moreover; we need good training in the field of thoracoscopic surgery as a surgical tool in managing such pathologies.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding

**References**


Effects of Nutrition Education on Pregnancy Nutrition Knowledge and Practice among Pregnant Women in Baghdad City

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¹Assist Prof. Community Health Department, College of Health and Medical Technologies, Baghdad, Middle Technical University/Iraq

Abstract

Objective: To define the effectiveness of nutrition education pregnant women during pregnancy.

Method: A cross-sectional study was conducted in medical city hospital. The sample was selected by (non-probability convenient sampling) and sample size was (150).

Results: The result detected that the middle age of the subjects was 27.40 ± 6.78 years and the 52.7% were housewife. A prevalent source of information for pregnant women about nutrition during conception is 48%. After nutrition education involvement, the ratio of pregnant women with learning on adequate nutrition during pregnancy increased from (39.78 to 74.33), while the pregnancy nutrition practice of the pregnant women increased from (50.17 to 76.89).

Conclusions: A nourishment education intervention will have a plus effect on nutritional knowledge and practice of pregnant women.

Keywords: Nutrition, Education, Knowledge, Practice, Pregnancy, Baghdad.

Introduction

A healthy and stable diet is important in the presence and during pregnancy in particular. It must supply a diet for the mother and the power of nutrients appropriate to meet the usual requirements of the mother, as well as the necessity of the growing fetus and enable mother to maintain itself essential to the health of the fetus and infant nutrients, as well as the practice of breastfeeding in the future. The main behest is to pursue a healthy, balanced diet(1).

Although most women are aware of the importance of healthy eating during pregnancy, but women may have a lack of knowledge of the specific dietary commendation may or may not enjoy the needful skills to improve dietary habits(2). One of the main causes of the problems of nutrition, lack of nutritional knowledge, leads to poor practice, causing serious damage, such as malnutrition and various non-communicable diseases(3).

Education is an important factor in health promotion. Determination of training needs is essential to achieve this goal(4). Knowledge is not demeanor, but it can be a mark factor of dietary behavior(5). Various Reports indicate that in most countries advanced, cannot receive adequate amounts of nutrients that depend on the recommended daily allowance by “(RDA)” by mothers(6).

The goals of nutrition education for pregnant women are relatively clear aiming at appropriate maternal weight gain, nutritional adequacy of the maternal
diet and affirmative infant outcomes, such as pleasant birthweight \(^7\).

Method:

The study design was conducted cross-sectional study design (comfortable taking samples) for pregnant women starting from (September 1, 2018 to March 1, 2019).

Setting of the Study: The study is conducted at medical city hospital.

The study sample: A convenient sample, purposeful sample of 150 female. The fact was collected by direct interview using special questionnaire to acquired socio-demographic information. (Age, education, occupation........ect.

Statistical Analysis Method

Descriptive statistics: The following statistical data analysis approaches were used in order to analyze and assess the results of the study:

a. Tables ( Frequencies, Percentages).
b. Mean of Score (M.S.), Standard Deviation, Relative sufficiency (RS).
c. “Chi-Square test”
d. “Binomial test”

Results and Findings

Table (1): Distribution of Parents (SDCv.) with comparisons significant

<table>
<thead>
<tr>
<th>SDCv.</th>
<th>Groups</th>
<th>No.</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Age Groups</td>
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</tr>
<tr>
<td>Per yrs.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 20</td>
<td>25</td>
<td>16.7</td>
<td></td>
</tr>
<tr>
<td>20 _</td>
<td>39</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>25 _</td>
<td>26</td>
<td>17.3</td>
<td></td>
</tr>
<tr>
<td>30 _</td>
<td>38</td>
<td>25.3</td>
<td></td>
</tr>
<tr>
<td>35 _ 40</td>
<td>22</td>
<td>14.7</td>
<td></td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>27.40 ± 6.78</td>
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<tr>
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<tbody>
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<td>Illiterate</td>
<td>3</td>
<td>2</td>
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<tr>
<td>Read &amp; write</td>
<td>6</td>
<td>4</td>
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</tr>
<tr>
<td>Primary</td>
<td>20</td>
<td>13.3</td>
<td></td>
</tr>
<tr>
<td>Intermediate</td>
<td>15</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>28</td>
<td>18.7</td>
<td></td>
</tr>
<tr>
<td>Collage</td>
<td>78</td>
<td>52</td>
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<tr>
<th>Occupation</th>
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<tbody>
<tr>
<td>Housewife</td>
<td>79</td>
<td>52.7</td>
<td></td>
</tr>
<tr>
<td>Workers</td>
<td>44</td>
<td>29.3</td>
<td></td>
</tr>
<tr>
<td>Students</td>
<td>27</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

\( \chi^2 = 8.333 \)  
\( P=0.080 \)  
\( \text{(NS)} \)

\( \chi^2 = 151.520 \)  
\( P=0.000 \)  
\( \text{(HS)} \)

\( \chi^2 = 28.120 \)  
\( P=0.000 \)  
\( \text{(HS)} \)

Table(1) shows that distribution of pregnant women has no significant different at \(P>0.05\) concerning age groups, with mean and standard deviation 27.40 and 6.78yrs respectively. Most of studied pregnant women has a high educated levels, such as graduates college and secondary school graduation, since they are accounted 106(70.7%) and had a highly significant different at \(“P<0.01”\). Finally, most of studied pregnant women has no occupation, such as “Housewife and Students” and they are accounted 106(70.7%).
Table (2): Distribution of reproductive variables and Information concerning pregnancy with comparisons significant

<table>
<thead>
<tr>
<th>Reproductive variables</th>
<th>Groups</th>
<th>No.</th>
<th>%</th>
<th>C.S. P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravidity</td>
<td>1_2</td>
<td>92</td>
<td>61.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3_4</td>
<td>49</td>
<td>32.7</td>
<td>(\chi^2 = 140.933)</td>
</tr>
<tr>
<td></td>
<td>5_6</td>
<td>6</td>
<td>4</td>
<td>(P = 0.000)</td>
</tr>
<tr>
<td></td>
<td>7_8</td>
<td>3</td>
<td>2</td>
<td>(HS)</td>
</tr>
<tr>
<td>Parity</td>
<td>1</td>
<td>96</td>
<td>64</td>
<td>(\chi^2 = 150.960)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>45</td>
<td>30</td>
<td>(P = 0.000)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>6</td>
<td>4</td>
<td>(HS)</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Number of ANC visits</td>
<td>Less than 4 visits</td>
<td>39</td>
<td>26</td>
<td>(P = 0.000)</td>
</tr>
<tr>
<td></td>
<td>4 visits and more</td>
<td>111</td>
<td>74</td>
<td>(HS)</td>
</tr>
<tr>
<td>Receiving Information</td>
<td>Yes</td>
<td>139</td>
<td>92.7</td>
<td>(P = 0.000)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>11</td>
<td>7.3</td>
<td>(HS)</td>
</tr>
<tr>
<td>Sources Information</td>
<td>Mainly</td>
<td></td>
<td></td>
<td>(\chi^2 = 73.800)</td>
</tr>
<tr>
<td></td>
<td>Health staff</td>
<td>72</td>
<td>48</td>
<td>(P = 0.000)</td>
</tr>
<tr>
<td></td>
<td>Other P.W.</td>
<td>18</td>
<td>12</td>
<td>(HS)</td>
</tr>
<tr>
<td></td>
<td>Friends</td>
<td>22</td>
<td>14.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Family and relative</td>
<td>19</td>
<td>12.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Media</td>
<td>19</td>
<td>12.7</td>
<td></td>
</tr>
</tbody>
</table>

Table (2) shows the Most of studied pregnant women has (1- 2) numbers of gravities, since they are accounted 92(61.3%) and had a highly significant different at “P<0.01”. Most of studied pregnant women has (1) parity, since they are accounted 96(64.0%) and had a highly significant different at “P<0.01”. Most of studied pregnant women has (4) visits to the ANC, since they are accounted 111(74.0%) and had a highly significant different at “P<0.01”. Most of studied pregnant women has receiving information, since they are accounted 139(92.7%) and had a highly significant different at P<0.01 compared with the leftover.

Table (3): Descriptive Statistics of Knowledge items concerning pregnancy women with comparisons significant

<table>
<thead>
<tr>
<th>Knowledge Items</th>
<th>No.</th>
<th>Pre</th>
<th>Post</th>
<th>C.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>SD</td>
<td>Ev.</td>
</tr>
<tr>
<td>How frequency and what amount a pregnant should eat</td>
<td>150</td>
<td>0.35</td>
<td>0.48</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge on effect of maternal under nutrition on</td>
<td>150</td>
<td>0.42</td>
<td>0.50</td>
<td>M</td>
</tr>
<tr>
<td>fetal weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge on eating variety food</td>
<td>150</td>
<td>0.80</td>
<td>0.40</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge on duration of iron supplementation in</td>
<td>150</td>
<td>0.44</td>
<td>0.50</td>
<td>M</td>
</tr>
<tr>
<td>pregnancy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge on need of foliate supplement early during</td>
<td>150</td>
<td>0.35</td>
<td>0.48</td>
<td>M</td>
</tr>
<tr>
<td>pregnancy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Knowledge Items

<table>
<thead>
<tr>
<th>Knowledge Items</th>
<th>No.</th>
<th>Pre</th>
<th>Post</th>
<th>C.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge about potentially harmful foods during pregnancy</td>
<td>150</td>
<td>0.28</td>
<td>0.72</td>
<td>0.000 HS</td>
</tr>
<tr>
<td>Knowledge on using iodized salt during pregnancy</td>
<td>150</td>
<td>0.19</td>
<td>0.79</td>
<td>0.000 HS</td>
</tr>
<tr>
<td>Knowledge on food source for iron</td>
<td>150</td>
<td>0.66</td>
<td>0.93</td>
<td>0.000 HS</td>
</tr>
<tr>
<td>Knowledge on energy requirement during pregnancy</td>
<td>150</td>
<td>0.37</td>
<td>0.55</td>
<td>0.001 HS</td>
</tr>
<tr>
<td>Knowledge on benefit of foliate during pregnancy</td>
<td>150</td>
<td>0.29</td>
<td>0.74</td>
<td>0.000 HS</td>
</tr>
<tr>
<td>Knowledge on fetal complication of maternal under nutrition</td>
<td>150</td>
<td>0.23</td>
<td>0.75</td>
<td>0.000 HS</td>
</tr>
<tr>
<td>Knowledge on maternal complications of under nutrition</td>
<td>150</td>
<td>0.34</td>
<td>0.65</td>
<td>0.000 HS</td>
</tr>
</tbody>
</table>

Table (3) shows testing significant with reference of studied items, as well as scoring scales evaluated concerning effectiveness of applying educational program were reported significant differences in at least at “P<0.05” toward of applying program through raising knowledge grades of studied respondents at the post period and that could be enable to confirms importance and successfullness of applying the proposed program.

### Table (4): Descriptive Statistics of Practices items concerning pregnancy women with comparisons significant

<table>
<thead>
<tr>
<th>Practices Items</th>
<th>No.</th>
<th>Pre</th>
<th>Post</th>
<th>C.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addition of at least one additional meal from non-pregnancy diet</td>
<td>150</td>
<td>0.75</td>
<td>0.91</td>
<td>0.000 HS</td>
</tr>
<tr>
<td>Eating grain breads, cereals, or others high-complex carbohydrates</td>
<td>150</td>
<td>0.77</td>
<td>0.86</td>
<td>0.111 NS</td>
</tr>
<tr>
<td>Eating green vegetables</td>
<td>150</td>
<td>0.50</td>
<td>0.82</td>
<td>0.000 HS</td>
</tr>
<tr>
<td>Taking iron supplement tablets in the past week</td>
<td>150</td>
<td>0.52</td>
<td>0.69</td>
<td>0.002 HS</td>
</tr>
<tr>
<td>Eating meat, fish,nuts,or legumes per day</td>
<td>150</td>
<td>0.49</td>
<td>0.53</td>
<td>0.545 NS</td>
</tr>
<tr>
<td>Eating fruit per day</td>
<td>150</td>
<td>0.33</td>
<td>0.75</td>
<td>0.000 HS</td>
</tr>
<tr>
<td>Nonalcohol use and smoking in the current pregnancy</td>
<td>150</td>
<td>0.46</td>
<td>0.90</td>
<td>0.000 HS</td>
</tr>
<tr>
<td>Eating 2 to 3 servings of dairy (milk, yogurt, eggs and cheese) per day</td>
<td>150</td>
<td>0.46</td>
<td>0.55</td>
<td>0.177 NS</td>
</tr>
<tr>
<td>Specify 3 types of food you normally eat for breakfast</td>
<td>150</td>
<td>0.47</td>
<td>0.78</td>
<td>0.000 HS</td>
</tr>
</tbody>
</table>
Table (4) shows a summary statistics of nutrition practice’s items along studied (Pre and Post) periods with comparisons significant. Results of testing significant with reference of studied items, as well as scoring scales evaluated concerning effectiveness of applying educational program were reported significant differences at $P<0.01$ toward of applying program through raising practices grades of studied respondents at the post period, except the items: (Eating grain breads, cereals, or others high- complex carbohydrates and Eating meat, fish, nuts, or legumes per day), since nonsignificant differences were accounted at “$P>0.05$” and accordance with preceding results.

Table (5): Descriptive Statistics of Knowledge and Practices main domains concerning (Pre-Post) education on pregnancy women

Table (5) shows a summary statistics of nutrition knowledge and practice’s concerning main domains along studied (Pre and post) periods. Results of testing significant with reference of studied domains reported highly significant differences at “$P<0.01$” toward of applying program through raising knowledge and practices grades of studied respondents at the post period and accordance with preceding results it could be enable to confirms importance and success fulness of applying the proposed program.

Table (6): Relationships between (Women’s Knowledge) and (SDCv. and Some Reproductive) variables
Tables(6) shows significant differences at “P<0.05” were reported for studied (SDCv.) of the studied subjects and reproductive variables, except age groups, since no significant different was reported at “P>0.05” and according to preceding outcomes it could be conclude that studied of educational program registered relationships with studied subjects in light of their positive personal characteristics, such as SDCv. and reproductive variables.

**Discussion**

Nutrition health affect maternal, before and during pregnancy, the health situation for itself and the developing fetus. Pregnancy is anerious condition for improving nutritional knowledge. In current study, most pregnant women belonging to the age group 20-25 years and the findings of the current study is an agreement with the results contained in Nigeria(8), this may be because the extreme ages of reproductive years are well known about nutrition during pregnancy. And almost about (52.7%) of them were housewife the finding of the attend study isapproval with findings reported in Ethiopia(9), found a highest rate were obtained by women of unemployed.

The results of this study also showed that the proportions of mothers with appropriate feeding mother during pregnancy knowledge was 39.78%. As a result of this study, it was agreed to study in America(10) which was more than half of the women in the study and the basic knowledge necessary with regard for the benefit of pregnancy nutrition.

But this result is less than the study conducted in Malaysia(11) and Swaziland (12), reported that 67% of mothers have adequate knowledge about maternal nutrition. This can be explained through the social, economic and cultural differences of the participants in the study. In this study, most pregnant women understand that mothers who suffer from a lack of nutrition will lead to complications of the fetus The finding of the current study is agreement with findings reported in Ethiopia(13) and in India(14). It reported that the proportion of pregnant women have to know that inadequate nutrition during pregnancy can cause complications of mothers such as abortion or premature birth This may be due to the difference in the beliefs of the causal disease in areas affected by the difference in the role of knowledge of cultural and spiritual influences.

After the implementation of nutrition education in this study, the proportion of pregnant women with good knowledge of nutrition during pregnancy from 39.78% to 74.33% and good practice increases 50.17% to 76.89% this outcome agreement with the study conducted in Ethiopia(9) in America(10) & in Iran(15), the results can indicate this to the effectiveness of nutrition education to improve the nutrition information for pregnant women.

Can be higher change in nutritional knоwledge among pregnant women in this study due to the interval between the evaluation before and after the evaluation and the fact that there was one only after the evaluation of education. Was seen to know pregnant women about nutrition during pregnancy is closely important between the educational status and sources of information and the number of pregnancies and agree this result with the study conducted in Malaysia(14) and Swaziland(12) and in Ethiopia(16), has shown that women with knowledge of the nutritional better in much higher educational level and sources of information.

Number of ANC visits was associated with knowledge of pregnant women in this study this result disagreement with the study done in Kenya (17), reported that nutrition knowledge level of those attending ANC was not significantly various from those not attending ANC.
Conclusions

Nutrition education during prenatal care to grant birth attention to improve the knowing and practice of women during pregnancy. These results showed also that the level of education, occupation of mothers, do not. of pregnancy, receiving information had prenatal health center to a great relationship with knowledge.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

Funding: Self-funding

References

Effects of Progesterone Hormone on the Urinary Tract Infection in Pregnant Women

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Abstract

Infection is the highest ratio between hospitals and visiting patients are nosocomial infection registered in hospital is the urinary tract infection (UTI). The information about the UTI causative agents and the effect of the Progesterone hormones at possibly will help to choose the right remedy. The current study aimed to discover the effect of the progesterone in pregnant women on the incidence of the UTI during pregnancy. The current study was carried out at Hilla General Teaching Hospital, Babylon, Iraq during January-October, 2019. Out of 100 urine testers poised from the outpatient women, the culture showed 15 isolates identified as Gram positive bacteria (15%), 82 isolates of Gram negative bacteria (82%) and 3 isolates of yeast (3%). The record collective pathogen isolated was Escherichia coli (48.3%), Klebsiella species (10%), Streptococcus faecalis (8%), Proteus merabilis (8%), Enterobacter cloacae (6%), Pseudomonus (5%), Acinetobacter (5%), Candida albicans (3%), Enterococcus faecium (2%), Staphylococcus aureus (2%), Streplococcus agalctiae (2%) and Staphylococcus epidermidis (1%). The progesterone hormone levels were estimated for all samples.

Keywords: Progesterone during pregnancy, UTI infection during pregnancy, urinary tract infection and age.

Introduction

Progesterone hormone produces that are synthesize and store in the brain in the different glands and during gravidity in the placenta. Throughout the latter two spans, femininity hormones¹, have a direct effect on the immune mediators levels such as (TNF-α), xanthine oxidase through periods of the multiplicative rotation². The imbalance of femininity hormones could affect the immune status of the animals³.

The main function of the progesterone is in the reproductive system, it has multiple other functions such as spasm and smooth muscle relaxation, expanding bronchi and regulates mucus⁴. It has been demonstrated that progesterone is responsible of the increase in the bladder aptitude and increase the frequency of genuine tension simultaneously through pregnancy⁵.

The urinary tract and the genital tract origin from the same embryonic tissues and distinguish during the development of the human, because of that, both systems are affected by the steroids sexual hormones through the development cycle, in the female, there are two main hormones affecting both tracts, estrogen and progesterone⁶.

(UTI) is occur when invades by microorganism one or more organizations in this tract, which combat the strong natural defenses of human body. Although, the immune emplacements, the furthermore public contaminations and container happen at whichever period of the individual life, it is responsible of approximately 8–35%of all the nosocomial contaminations⁷.
Contagions are produced by the bacteria that colonization Urinary tract as the urethra. The most predominant agent of the Uropathogenic *E. coli* UPEC, which reasons over 90% of the UTI contagions in adults. Patients suffered from recurrent infections, organizational irregularities in the urinary tract, had urethral arrangement, acquired contaminations from hospital are exposed to increased incidence of infection caused by pathogenic bacteria and other organisms.

Complex and uncomplicated Urinary tract infection is always difficult to distinguish and this distinction helps in the clinical diagnosis that helps in adopting a patient’s treatment protocol. The uncomplicated type occurs Generally in pre-menopausal healthy Women.

Multiple strains of bacteria are opportunistic and have a role in causing disease. Infections in people with weak immunity often acquire infection when visiting the hospital.

### Material and Method

1. **Sample Collection:** Samples were the urine mid-stream clean fastener samples were collected from hospitalized patients in Al-Hilla General Teaching hospital. The samples(100) were by the relevant biochemical tests according to [12].

Results blood and MacConkey agar Culture were take to mean conferring to the typical benchmarks and a progression of colony forming units/ml was reflected as substantial bacterial infections.

2. **Blood Samples:** 5ml of blood were collected bin anticoagulant free tubes was disjointed. The serum by at about 3000 (R.P.M) for 5 min by centrifuge within 2-3 hours after collection.

3. **Microscopic Investigation (Colony morphology):** The affirmative culture and identified according to their morphological properties to identify the microorganism. (Analytical profile index API-20E) was secondhand to recognize Enterobacteriaceae household and connected organisms rendering to producer’s guidelines.

4. **Progesterone ELISA Assay:** The Progesterone ELISA Assay tackle is a reasonable insusceptible enzymatic technique for quantifiable purpose of Progesterone meditation in anthropological serum or plasma. According to the ICN guide for Endocrine analysis., ICN Biomedical, Inc.pp.2:20-27[14].

### Result

1. **Identification of bacteria:** Identification of bacteria carried out by bacteriological approaches the cultivated tasters remained positive culture, only (82) nations were characterized as (18) cultures were identified as gram negative bacteria and yeast.

Among (100) cultures which showed a significant bacterial growth the distribution of the strains were *Escherichia coli* (48.0%), *Klebsiella* species (10%), *Streptococcus faecalis* (8%), *Proteus mirabilis* (8%), *Enterobacter cloacae* (6%), *Pseudomonus* (5%), *Acinetobacter* (5%), *Candida albicans* (3%), *Enterococcus faecium* (2%), *Staphylococcus aureus* (2%), *Streptococcus agalactiae* (2%) and *Staphylococcus epidermidis* (1%). as in table (1)

<table>
<thead>
<tr>
<th>Type of Microorganisms</th>
<th>Number</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gram positive bacteria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enterococcus faecalis</td>
<td>8</td>
<td>15%</td>
</tr>
<tr>
<td>Enterococcus faecium</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Streptococcus agalctiae</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Staphylococcus epidermidis</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
2. Correlations between months of pregnancy, hormone level, type of bacteria and age: The data was analyzed by using IBM SPSS software version 2.0. The p value of <0.05 stayed painstaking as substantial. The confident and destructive predictive value were calculated and the result showed no significant differences between months of pregnancy, hormone level, type of bacteria and age as showed in Table (2).

Table (2): Correlation frequencies between months of pregnancy, hormone level, type of bacteria, age.

<table>
<thead>
<tr>
<th>Correlation</th>
<th>Month of pregnancy</th>
<th>Hormone level</th>
<th>Type of bacteria</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pearson Correlation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Month of pregnancy</td>
<td>.107</td>
<td>-.042</td>
<td>-.011</td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.292</td>
<td>.682</td>
<td>.915</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Hormone level</td>
<td>.107</td>
<td>1</td>
<td>-.080</td>
<td>-.048</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.292</td>
<td>.428</td>
<td>.634</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Type of bacteria</td>
<td>-.042</td>
<td>-.080</td>
<td>1</td>
<td>.024</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.682</td>
<td>.428</td>
<td>.810</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Age</td>
<td>-.011</td>
<td>-.048</td>
<td>.024</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.915</td>
<td>.634</td>
<td>.810</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

3. Frequency distribution of the progesterone hormone level: The progesterone concentration in the serum of pregnant women was determined according to the method for quantitative determination of hormone level. The result showed that the lowest concentration of the progesterone was 7.1 ng/mL, (0-20) ng/mL showed the lowest frequency, the high incidence in (21-42) ng/mL and (61-83) ng/mL and the lowest incidence was (80-100) ng/mL, with Mean=45.86 and standard division =22.145 as in figure (1).
4. **Frequency distribution of UTI infection according to the month of the pregnancy:** The result showed that the highest frequency of the UTI infections per month of pregnancy was among the group (1-3) months, (3-6) months and (6-9) months with mean=4.83 and standard division =2.23 with Cumulative Percent as revealed in Figure (2).
5. **Frequency distribution of UTI infection according to the type of microorganisms:** The bacterial growing were characterized as as Gram + and Gram negative, *Escherichia coli* recorded the uppermost percentage among all the isolates which was (48%) followed by the *Klebsiella* species (10%), *Streptococcus faecalis* (8%), *Proteus mirabilis* (8%), *Enterobacter cloacae* (6%), *Pseudomonas* (5%), *Acinetobacter* (5%), *Candida albicans* (3%), *Enterococcus faecium* (2%), *Staphylococcus aureus* (2%), *Streptococcus agalactiae* (2%) and *Staphylococcus epidermidis* (1%), with Mean=4.75 and standard division =2.973 as shown Figure (3).
Figure (3): Histogram shows frequencies between types of bacteria with Mean = 4.75 and standard Division = 2.973. 1 = Acinetobacter, 2 = Candida albicans, 3 = Escherichia coli, 4 = Enterobacter cloacae, 5 = Klebsiella pneumonia, 6 = Proteus mirabilis, 7 = Pseudomonas aeruginosa, 8 = Staphylococcus aureus, 9 = Staph. epidermidis, 10 = Streptococcus agalctiae, 11 = Strept. faecium, 12 = strept. fecalis

6. Distribution of UTI infection according to the age: The result in the contemporary revision showed that the highest occurrence of the UTI infection was among the age 20-25 years (40%), followed by 25-30 years (30%), whereas the lowest infections were in age group 15-20 and 30-35 years which was (15%) with Mean=24.75 and standard Division =5.13 9 as shown Figure (4).
Figure (4): Histogram shows frequencies of the UTI according to the age per years with Mean = 24.75 and standard Division = 5.139

Discussion

Sexes hormones have an impact on the UTI in different organisms, demonstrated that during the follicular stage the progesterone is the prevalent hormone in the adult females, which make it cause an increase in bladder oscillation in contrast to the luteal stage which is distinguished by the decrease in the bladder expand [15].

During pregnancy awake to 60% of prenatal women are suffer from anxiety incontinence indications, they suggested that the progesterone high level might be the reason for that the progesterone cause a reduction in the muscle manner of the ureters, which leads to the dilation in the ureters accompanied by a reduce and restriction in the flow of the urine the consequences of the increase in progesterone will be the urinary incontinence and urinary tract infections [16].

A pregnant and non-pregnant female share the same organisms that is Escherichia coli has been recorded in many studies as the most common pathogen in the UTI in highly rate of cases of pyelonephritis in pregnant patients Other bacteria-which may be isolated [17].

The results of present study agreed with [18] exceptsome diversion in the patients registered in the urological operation regions, anywhere the nosocomial contagions were mainly produced by K. pneumniae and P.aeruginosa [19]. P.aeruginosa is inhabit and
arrangement a biofilm that interferes with the action of the antimicrobial managers and congregation protection mechanism [20].

This product reach a decision with alternative schoolwork on urinary tract contaminations in patients with renal stones [21] in which, the maximum ratio of the UTI bacteria was according to the E. coli, followed by Proteus spp., Klebsiella pneumoniae, Pseudomonas aeruginosa, correspondingly and this outcomes drives marginally with at raining on public developed UTI which presented that E.coli was responsible of 73% of the total UTI infections, whereas K. pneumoniae 6.5%; P.aeruginosa 2.3%, Proteus spp. 2.1%[22] and, agreed with [23] that reported the record collective bacteria isolate was Escherichia coli with (57%), shadowed by Strep. fecalis(16%), Klebsiella & Pseudomonous classes (8%); Staphylococcus epidermidis (6%); Proteus classes (1.6%); Acenatobacter & Citrobacter (1.3%); Staphylococcus saprophyticus (0.4%). The sequestration percentage of urinary bacteria of the current study is dependable with the results reported in NNIS, (1997)[24], which demonstrated that Enterobacter cloacae remained triggered (9.5%), the evidence that the bacterial endotoxins and exotoxins have a direct effect on the reproductive organs and related hormones [25].

Distribution of UTI infection According to Age: UTI infection among the patients according to age group 15-20 years was (15 %), 20-25 years (40 %) and 25-30 years (30%), the lowest incidence was in 30-35 years(15%), as shown in figure(4), in addition to the practice of the diaphragm and spermicidal contraceptives which modify the ordinary vaginal vegetation and possibly will allow establishment by pathogenic bacteria[26].

Frequency Distribution of the UTI infection According to Progesteronehormone level: The progesterone was 7.1 ng/mL which was among the class group (0-20) ng/mL, the high incidence was showed in (20-40),(40-60) and (60-80) ng/mL, the lowest incidence was in (80-100) ng/mL, this might be due to the hormonal changes through the physiological cycle of women, increase subsequently ovulation and/or the duration of the luteal period. During gravidity, the progesterone levels conserved at the same luteal planes[27].

Conclusion

The current study was aimed to point the UTI combined with the progesterone level the study concluded that the hormone levels were highest in the first months of the pregnancy, also showed that the incidence of the UTI was highest in the first months of the pregnancy, linked the two parameters (hormone level and the UTI) in the first months give a clear evidence that the hormone level no affect the UTI, the most affected age was 20-25 years.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

Funding: Self-funding

References


The Impact of Maternal Age on Intracytoplasmic Sperm Injection (ICSI) Outcomes in Infertile Couples

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Abstract

Objective: The aim of the study is to investigate the impact of maternal age on ICSI outcomes represented by the number of retrieved oocytes, number of fertilized oocytes, embryo quality and pregnancy rate in infertile couples undergoing ICSI.

Patients and Method: The study included sixty two infertile couples who underwent ICSI cycles. They divided in to two groups depending on females’ age: group Ι with age less than 35 years and group ΙΙ with age more than 35 years. Assessment of ICSI outcomes in form of retrieved oocytes number, fertilized oocytes number, quality of embryo and rate of pregnancy were done and the results were compared between both groups.

Results: The study showed that females whom their age more than 35 years produced significantly lower oocytes number with a lower fertilization rate when compared with females younger than 35 years. (the mean total number of retrieved oocytes 3.24±0.52 vs 10.84±0.81 and the mean total number of fertilized oocytes 2.29±0.26 vs 7.62±0.52, p-value =0.002 and 0.02 respectively. The total number of good quality embryos was significantly less in the females older than 35 years 1.12±0.18 vs 6.80±0.46, p-value=0.003 and the total number of bad quality embryos was significantly more 1.47±0.24 vs 0.60±0.1, p-value=0.02 when compared with females younger than 35 years. Pregnancy rate was significantly less in the older females p-value=0.0005.

Conclusion: The maternal age is one of the most important predictor of ICSI outcomes. An advanced females age has a negative impact on ICSI outcomes and females older than 35 years usually produced lower number of oocytes during oocytes’ retrieval with a lower fertilization rate. Embryos produces from those females usually of bad quality and exhibited a lower implantation potential.

Keywords: Sperm injection; Age; health; infertile couple.

Introduction

Assisted reproduction; in vitro fertilization (IVF)/ICSI is considered the final treatment modality for couples who fail to achieve pregnancy(1). ICSI is firstly used to treat infertile men and today, it becomes the most commonly applicable micromanipulator technique of all assisted cycles being used for most of infertility cases other than male factor infertility.

The international committee for assisted reproductive technologies monitoring was reported that ICSI was applied in 65% of cycles in Europe and this is highlighted in some areas of the world, ICSI is practiced in 100% of in vitro cycles(2).

It has been showed that older infertile women are at high risk of having poor ovarian reserve and producing
bad quality oocytes following traditional medical infertility treatments, which makes ICSI of a great benefit in this group. However, multiple factors tend to affect ICSI outcomes such as female age and reserve of ovaries.

The advance maternal age is defined 35 years or more at time of childbirth, it has been revealed that females’ age is one of main important factors of reproductive outcome and fertility. The chance of getting pregnancy after natural or assisted conception is highly dependent on maternal age.

The poor ovarian reserve and reduced the developmental competence of oocytes are the main reasons for age related infertility. It has been reported that advanced female age was considered one of the factors that leads to oocyte aging, which may cause atypical fertilization and abnormal development, such as arrested division, implantation failure and abortion. In addition, the aneuploidy rate has been increased in the oocytes and embryos, which are produced from old women. Women with an age of 38 years have poor outcomes and this negative impact is increased with increasing age over 40 years.

Patients and Method

All included couples were taken from the IVF clinic in Fertility Center, Al-Sader Medical City, Al-Najaf Al-Ashraf in Iraq. All of them were assessed by history, physical examination, fertility investigations at the second day of the female cycles (Estrogen (E2), follicle stimulating hormone (FSH), lutenizing hormone (LH) prolactin, trans-vaginal ultrasound (TVUS) for assessment of ovarian reserve and endometrial thickness) and male partners’ seminal fluid analysis. All couples were subjected to ICSI due to unexplained infertility. They divided into 2 groups according to female partners’ age; GI: females whom their age between 20-34 years (n=45) and GII females whom their age between 35-45 years (n=17). Female partners were subjected to controlled ovarian stimulation from cycle day two by gonadotropin releasing hormone GnRH antagonist (Cetrotide 0.25 mg*1) followed by gonadotropins stimulation (Follitrope 75 iu*2) for 7-10 days to induce development of multiple follicles. When TVUS showed 6 or more follicles of size 18 mm, Human Chorionic Gonadotropin (hCG): Pregnyl 5000 iu *2 was given to induce final maturation of oocytes and all these were under the continuous monitoring by TVUS and serum E2 assay. Ovum pick up was performed under general anesthesia and TVUS 34-36hr after hCG injection. The retrieved follicles were denuded chemically by hyaluronidase enzyme and mechanically by frequent pipetting of cumulus-oocyte complex through different size pipettes. Only metaphase II (MII) oocytes are considered mature and used for injection. Preparation of the ejaculated semen to obtain viable sperms was done concomitantly by direct swim-up from pellet (according to WHO, 2010). Injected oocytes were washed and incubated in culture media under 5% CO2 and 37°C. Normally the fertilized oocytes displayed 2 pronuclei and two polar bodies 16-18h after injection. Subsequent monitoring of the embryo quality was done based on blastomeres (number, shape and equality), nucleation and the percentage of fragmentations. The embryos were classified as good quality (grade I & II) when they have 4 cells at 48 hr or 6-8 cells 72 hr post injection, with even sized blastomeres and little or no fragmentation. Anything else were classified as bad quality embryos (grade III & IV).

Up to 3 embryos(I,II) were delivered to the uterus at day 3 after injection under TVUS guidance followed by luteal phase support by vaginal progesterone; duphaston tablets 400 mg*2, aspirin tablets 100mg *1 and folic acid tablets 5 mg*1. The pregnancy was diagnosed chemically by measuring B-hcg titer in the serum of females whom underwent embryo transfer was performed 14 day after embryo transfer(ET). Pregnancy rate calculation was done by dividing the number of females who get on the total number of females whom embryos were transferred to the uterus *100%.

Study design & Statistical analysis: The study is cross sectional, observational done prospectively. Statistical analysis was done by SPSS version 20 by measuring mean and standard deviation for the continuous data using t-test. A p-value <0.05 was significant statistically.

Results

Table (1) reveals cycle day 2 hormonal profile, duration of infertility and endometrial thickness in the studied groups, no significant differences were presented in both groups except duration of infertility which was significantly longer in the older females, p-value=0.007.
Table (1): The hormonal levels, duration of infertility and endometrial thickness among study groups.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group I (age 20-35 years), (n=45) (mean ± SE)</th>
<th>Group II (age 35-45 years), (n=17) (mean ± SE)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of infertility (day)</td>
<td>7.33±0.56</td>
<td>9.65±1.61</td>
<td>0.007</td>
</tr>
<tr>
<td>FSH (iu/l)</td>
<td>5.23±0.26</td>
<td>5.72±0.75</td>
<td>0.08</td>
</tr>
<tr>
<td>LH (iu/l)</td>
<td>4.36±0.41</td>
<td>3.06±0.41</td>
<td>0.11</td>
</tr>
<tr>
<td>E2 (pg/ml)</td>
<td>32.94±1.89</td>
<td>37.36±3.58</td>
<td>0.88</td>
</tr>
<tr>
<td>Endometrial thickness (mm)</td>
<td>4.17±0.11</td>
<td>3.88±0.18</td>
<td>0.56</td>
</tr>
</tbody>
</table>

Table (2) exhibits the response to controlled ovarian stimulation represented by duration of stimulated cycles, mean total number of retrieved oocytes, mean total number of fertilized oocytes and embryo quality in both groups. With the exception of cycle duration, there was a significant variation in both groups regarding these parameters being less in the females of age 35-45 years.

Table (2): A comparison of duration of stimulated cycles, number of retrieved oocytes, number of fertilized oocytes and embryos’ quality between both groups.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group I (age 20-34 years), (n=45) Mean±SD</th>
<th>Group II (age 35-45 years), (n=17) Mean±SD</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of cycles (days)</td>
<td>10.56±0.25</td>
<td>10.65±0.63</td>
<td>0.07</td>
</tr>
<tr>
<td>No of retrieved oocytes</td>
<td>10.84±0.81</td>
<td>3.24±0.52</td>
<td>0.002</td>
</tr>
<tr>
<td>No of fertilized oocytes</td>
<td>7.62±0.52</td>
<td>2.29±0.26</td>
<td>0.02</td>
</tr>
<tr>
<td>No. of embryos (I, II)</td>
<td>6.80±0.46</td>
<td>1.12±0.18</td>
<td>0.003</td>
</tr>
<tr>
<td>No. of embryos (III, IV)</td>
<td>0.60±0.1</td>
<td>1.47±0.24</td>
<td>0.02</td>
</tr>
</tbody>
</table>

**Discussion**

Females’ age is the main important factor affecting her fertility and her chance of getting a baby. In most women, ovarian aging will have started before any changes in their menstrual cycle; therefore, they may be at high risk of reduced fertility\(^5\). Advanced women age have been associated with high rate of maternal and obstetrical complications such as maternal death, fetal and neonatal death, maternal hypertension, prematurity and operative delivery\(^{13}\). Many authors reported that poor IVF outcomes have been associated with increasing of maternal age\(^{14}\). Some centers of IVF restrict the maternal age for IVF as 43 years\(^{10}\). Older women have poor response to controlled ovarian hyper stimulation, decreased number of retrieved oocytes, decreased number of fertilized oocytes, poor quality embryos, low implantation rate, lower pregnancy rate, higher miscarriage rate and birth defects\(^{9,11,15,16}\).

The present study showed that retrieved oocytes, fertilized oocytes, embryo quality and pregnancy chance depend primarily on maternal age. Some results were consistent with our findings\(^{16}\). Other authors reported that the outcome of IVF (retrieved oocytes number) was highest in women aged less than 30 years with poor quality embryo and lower percentage of pregnancy were observed in older women\(^{11,15,17-19}\). However, some reports, which exhibited, that there is no correlation between maternal age and pregnancy rate are still present\(^{20}\). This could be related to the facts that aging process will lead to ovulatory dysfunction, poor ovarian reserve which in turn lead to producing little number oocytes with poor developmental potential, reducing the chance of getting good quality embryos with a high implantation potential\(^{21-26}\).
**Conclusion**

The maternal age is one of the most important predictor of ICSI outcomes. An advanced female’s age has a negative impact on ICSI outcomes and females older than 35 years usually produced lower number of oocytes during oocytes’ retrieval with a lower fertilization rate. Embryos produces from those females usually of bad quality and exhibited a lower implantation potential.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding

**References**


The Percentage of Self-management Contribution to the Professional Adequacy of Physical Education Teachers

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¹Post Graduate, ²Assist. Prof., University of Babylon/College of Physical Education and Sports Science/IRAQ

Abstract

Therefore, the researchers wanted to know the nature of the relationship between self-management and the professional adequacy of teachers of physical education in order to help those interested in teacher affairs to develop appropriate plans to advance the educational process. The research aimed to identify the reality of self-management and the professional adequacy enjoyed by the members of the research sample and to identify the relationship between self-management and the professional adequacy enjoyed by the members of the research sample and the percentage of the contribution of self-management in this relationship.

The researchers used a descriptive approach to the survey method and correlations, due to its relevance and the nature of the present study. Information and data were collected from the research community and represented by physical education teachers in middle schools of the General Directorate of Education for Babil Governorate. After collecting the data and statistically processing them, the most important conclusions were reached:

1. Physical education teachers in the schools of the Babil Governorate Center enjoyed good management and high levels of professional competence in their field of work, which they assessed on the basis of their achievement.

2. There is a positive correlation between the themes of self-management and the professional competence of physical education teachers.

3. Planning is the most important aspect of the self-management scale that contributes to professional competence and the least areas of self-management contribute to professional sufficiency. The balance was for teachers of physical education.

Keywords: Self-management, professional adequacy and physical education.

Introduction

The physical education teacher is one of the prominent pillars in the educational process because it has a vital role in establishing the rules of scientific knowledge and moral values among students, so the teacher requires self-management through the teacher’s interaction with his environment and his proper training and psychological development. It occurs in an atmosphere in which the teacher is able to be able to accept himself and in this way, the teacher becomes able to improve the quality of life and improve his personality by taking advantage of his capabilities and capabilities and defining his goals accurately and working to pursue its achievement.

Therefore, faculty members should be characterized by distinct characteristics and adopt various educational method when dealing with students that stem from their professional sufficiency, which leads to providing
educational climates through which the educational process outputs can be accessed. Therefore, the researchers wanted to know the nature of the relationship between self-management and the professional adequacy of teachers of physical education in order to help those interested in teacher affairs to develop appropriate plans to advance the educational process.\(^1\)

The assessment of the adequacy of the teacher is an objective function, a tool and a scientific method aimed at making judgments about the extent to which the educational process achieves its goals and objectives. The importance of the teacher evaluation in revealing the teacher’s influence in the educational process is demonstrated. And reveal the deficiencies, if any and suggest the appropriate means and work to achieve educational goals. Educational and teaching competencies are one of the main aspects of evaluating the teacher’s professional performance and the availability of teaching competencies and the teacher’s ability to show us indicators of the possibility of an indirect evaluation of teacher preparation programs. The supervisors, educational specialists and the first teachers with field experience in highlighting the teaching competencies of the teachers and teachers of physical education for the middle school stage.\(^2\)

**Research objectives:**

1. Knowing the reality of self-management and the professional competence of the members of the research sample.

2. Knowing the relationship between self-management and the professional adequacy enjoyed by members of the research sample and the percentage of self-management’s contribution to this relationship.

**Research hypotheses:**

1. There is a statistically significant relationship between self-management and professional adequacy in the research sample.

2. There are different contribution rates for the self-management components of the professional adequacy of the research sample.

**Research fields:**

- The human field: middle school teachers to teach physical education in Babil Governorate.
- Spatial field: middle schools in Babil Governorate.

**Research methodology and field procedures**

**Research Methodology:** The researchers used a descriptive approach to the survey method and correlations, due to its relevance and the nature of the present study.

**Research community and samples:** Information and data were collected from the research community represented by physical education teachers in middle schools affiliated to the General Directorate of Education for Babil Governorate and table (1) shows that.

### Table 1. Shows the distribution of community members and research samples and percentages for each sector

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Section</th>
<th>Research community</th>
<th>Sample reconnaissance</th>
<th>Sample preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>Percentage</td>
<td>N</td>
</tr>
<tr>
<td>1</td>
<td>Hilla</td>
<td>93</td>
<td>40.08%</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>Hashemite</td>
<td>54</td>
<td>23.2%</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>Musayyib</td>
<td>42</td>
<td>18.10%</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Mahaweel</td>
<td>43</td>
<td>18.53%</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>232</strong></td>
<td></td>
<td><strong>100%</strong></td>
<td><strong>10</strong></td>
</tr>
</tbody>
</table>

**Search tools and devices used:** (Interview, questionnaire, Arab and foreign sources, 1 electronic stopwatch, data download forms, pens).
Field research procedures:

Validity of the paragraphs of the self-management scale for physical education teachers: In order to identify the validity of the paragraphs related to self-management in the research sample, the researchers presented a questionnaire that includes the 44 paragraphs of the above-mentioned scale. The researchers found that all paragraphs were significant under the significance level of 0.05 and the degree of freedom (1) and table (2) shows that.

<table>
<thead>
<tr>
<th>S</th>
<th>Paragraph</th>
<th>Validity</th>
<th>Calculated (Chi square)</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>9</td>
<td>0</td>
<td>Sig.</td>
</tr>
<tr>
<td>1</td>
<td>1-2-3-4-5-7-12-13-14-17-19-22-23-24-25-26-28-33-35-37-38-39-44</td>
<td>9</td>
<td>0</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

The validity of the paragraphs of the professional sufficiency scale for physical education teachers: In order to identify the validity of the paragraphs related to self-management in the research sample, the researchers presented a questionnaire containing the (52) paragraphs of the above-mentioned scale to the experts and specialists. The researchers found that all items were significant below the significance level of (0.05) and the degree of freedom 1 and Table (3) shows that.

<table>
<thead>
<tr>
<th>S</th>
<th>Paragraph</th>
<th>Validity</th>
<th>Calculated (Chi square)</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>9</td>
<td>0</td>
<td>Sig.</td>
</tr>
<tr>
<td>1</td>
<td>1-3-5-6-7-8-9-10-12-13-14-16-17-20-22-23-25-28-30-33-34-35-36-37-38-39-41-42-43-45-46-47-48-49</td>
<td>9</td>
<td>0</td>
<td>Sig.</td>
</tr>
<tr>
<td>2</td>
<td>2-4-15-18-21-24-24-31-31-40-4-4-50-52-52</td>
<td>8</td>
<td>1</td>
<td>5.444</td>
</tr>
</tbody>
</table>

Pilot study: In order to verify the scientific weight of the two scales (self-management, professional sufficiency), the exploratory experiment that took place on 11/11/2019 and the experiment was repeated on 11/11/2020 must be repeated on a sample consisting of (10) teachers studying physical education in Babylon.

Validity of the two scales (self-management, professional competence): The researchers used the validity of the content by presenting the two scales in a questionnaire to the experts and specialists. The two scales confirmed their validity.

Stability of the two measures (self-management, professional competence): The researchers conducted the pilot study on 11/11/2019 and returned it on 11/11/2020, i.e. between the experiment and 30 days in order to ensure stability. The researchers extracted the Pearson correlation coefficient, as it had a self-management scale of 0.95 and a significance level of 0.01 which is a lower level from the 0.05 level specified for accepting error, the measure of professional adequacy was Pearson’s correlation coefficient between his experiment and his experiment was repeated by 0.94 and at the significance level of 0.01 which is a level lower than the 0.05 level determined to accept the error.

Objectivity of the two scales (self-management, professional competence): The researchers put a number of repeated paragraphs in the original paragraphs
of the two scales and noted that the repeated paragraphs gave the same answers as the members of the research sample at 100%, which means that the two scales were highly objective.\(^4\)

**The main experience:** The researchers conducted the main experiment on 15/1/2020, based on the findings of the exploratory experiment from results on a sample of 145 teachers in order to tabulate the data for conducting the presentation, analysis and discussion.

**Statistical means:** The researchers used the SPSS statistic to analyze the results and the most prominent laws used were (Chi square), mean, standard deviation, Pearson correlation coefficient.

**Results and Discussions**

Through the main experiment, the researchers were able to collect and schedule data for presentation, analysis and discussion.

**Table 4. Shows the descriptive statistics indicators to measure the areas of self-management and the dimensions of performance evaluation form**

<table>
<thead>
<tr>
<th>S</th>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Planning</td>
<td>32.24</td>
<td>4.38</td>
<td>0.111</td>
</tr>
<tr>
<td>1</td>
<td>Time management</td>
<td>35.88</td>
<td>4.22</td>
<td>0.718</td>
</tr>
<tr>
<td></td>
<td>Self-assurance</td>
<td>44.38</td>
<td>4.922</td>
<td>0.511</td>
</tr>
<tr>
<td></td>
<td>Balance</td>
<td>31.44</td>
<td>3.981</td>
<td>0.630</td>
</tr>
<tr>
<td></td>
<td>Connection</td>
<td>36.231</td>
<td>4.086</td>
<td>0.128</td>
</tr>
<tr>
<td></td>
<td>Professional competence</td>
<td>363.49</td>
<td>25.58</td>
<td>-0.39</td>
</tr>
</tbody>
</table>

Through table (4) we note that the arithmetic mean for the axes of the scale of self-management (planning, time management, self-confidence, balance, communication) and professional adequacy respectively (32.24, 35.88, 44.38, 31.44, 36.231, 363.49) and with a standard deviation is the same in the same order For the researched variables (4.38, 4.22, 4.922, 3.981, 4.086, 25.58), as for the Skewness, all of it was zero, which means that it is distributed in a moderate distribution.\(^5\)

**Table 5. Shows the correlations, the percentage of contribution of the fields of self-management and the professional adequacy of the research sample**

<table>
<thead>
<tr>
<th>Self-management areas</th>
<th>Correlation value</th>
<th>Error percentage</th>
<th>Type of significance</th>
<th>Contribution rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>0.810**</td>
<td>0.0022</td>
<td>Sig.</td>
<td>0.656</td>
</tr>
<tr>
<td>time management</td>
<td>0.663**</td>
<td>0.0041</td>
<td>Sig.</td>
<td>0.439</td>
</tr>
<tr>
<td>Self-assurance</td>
<td>0.791**</td>
<td>0.0031</td>
<td>Sig.</td>
<td>0.625</td>
</tr>
<tr>
<td>Balance</td>
<td>0.619**</td>
<td>0.0043</td>
<td>Sig.</td>
<td>0.383</td>
</tr>
<tr>
<td>Connection</td>
<td>0.633**</td>
<td>0.004</td>
<td>Sig.</td>
<td>0.40</td>
</tr>
</tbody>
</table>

Note: The sign (**) means that the association was high and with a low error rate, i.e. less than 0.01

Table (5) shows the correlation values of the fields of self-management with the professional sufficiency of physical education teachers, which are (planning, time management, self-confidence, balance, communication) and their correlation values were in order (0.810, 0.663, 0.791, 0.619, 0.633) and by error ratios were all less of 0.05, which means that all of the correlations were of a significant and statistic characteristic. And if we notice
the percentage of the contribution of planning with vocational sufficiency was relatively high and estimated at (0.656) and this indicates that there is a high correlation between the field of planning and vocational sufficiency among teachers of physical education in middle schools in Babil province and this is what confirms that there is a vision and desire among physical education teachers behind getting on achievements within festivals, symposia and conferences and following up the developments of the educational process.  

As the pursuit according to a deliberate scientific planning to reach a good educational productivity leads to a suitable professional competence for that. As for time management, his contribution rate was (0.439), with the professional adequacy of the research sample, in keeping pace with modern scientific developments through its preparation of the scientific material and its appropriateness not Amar students and preparing it for weekly, monthly and yearly plans to study physical education and its suitability to the conditions and capabilities of the school and researchers attribute this to the commitment of teachers of physical education In middle schools in the province of Babel, study physical education to be consistent and responsive to the needs and aspirations of society and the extent of their knowledge of the scientific subject and the extent of their relevance to reality and the available capabilities.  

As for the field of self-confidence, the percentage of its contribution to professional adequacy (0.625) is relatively good, as there is a desire of physical education teachers to pay attention to the performance of their duties and commitment to preparing records for the lesson of physical education and contribute to solving obstacles facing students and contribute to creating a good state of respect And commitment within the school. As for balance, his contribution rate with professional adequacy was (0.383). Attention of the teacher by the educational institution and the development and motivation of self-management has according to plans based on scientific foundations that increase the strength and control of the physical education teacher on events and situations and this is reflected positively on career performance. Finally, with regard to the communication field, its contribution rate is (0.40) and that the evaluation process and their analysis of performance constitutes a positive step as it assesses the extent of progress and demonstrates the need for additional development and for new evaluation provisions from the viewpoint of teachers who practice the work and the result is a cause for the satisfaction of the supervisor, director and education teachers of sports, which leads to the practice of teachers not their activities more effectively.  

Conclusions  

Physical education teachers in the schools of the Babil Governorate Center enjoyed good management and high levels of professional competence in their field of work, which they assessed on the basis of their achievement. There is a positive correlation between the themes of self-management and the professional competence of physical education teachers. Planning is the most important aspect of the self-management scale that contributes to professional competence and the least areas of self-management contribute to professional sufficiency. The balance was for teachers of physical education.  

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.  

Conflict of Interest: Non  

Funding: Self-funding  

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A Comparative Study on the Chest CT Scan Radiological Findings and Hematological Parameters of COVID–19 and Non–COVID-19 Pneumonia patients in Al-Yarmouk Teaching Hospital in Baghdad, Iraq

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Abstract

Background: Chest CT scan has a great sensitivity with rapid diagnoses of COVID-19 infection in the community. Nevertheless, the specificity of this test for diagnosis of this disease are believed to be low.

Objective: To evaluate role, effectiveness and diagnostic accuracy of chest CT scan with main imaging manifestations and hematological appearances for screening COVID-19 cases through comparing results of those with other NON-COVID-19 pneumonia.

Patients and Method: Twenty COVID–19 & 28 NON–COVID–19 pneumonia Iraqi patients in Yarmouk teaching hospital, Baghdad, Iraq from 1 march to 1 may 2020, at the beginning of the outbreak in Iraq COVID–19 had been included in current research. Confirmed COVID–19 together with NON–COVID–19 patients to be infected or not with SARS-CoV-2 using RT-PCR were included in current research. Socio-demographic, hematological and chest CT scan finding were examined to compare the variance between COVID-19 and NON-COVID-19 patients.

Result: “COVID-19” patients mean age was 62.10 ±14.308SD ranged between 35- 90 years whereas “non-COVID-19” patients mean was 61.07± 13.638 SD. There was a significant difference between WBC average number of COVID-19 compared to its average number of “NON-COVID-19” patients (P<0.001). A significant differences between Neutrophils, lymphocytes, Monocytes, Eosinophil and Basophils low counts and MCV, MCH, PDW of COVID-19 compared to its counts or levels in “NON-COVID-19” patients (P<0.001). A significantly different of CT scan Images ‘Ground glass opacity, Crazy paving alteration’, ‘Vascular dilatations, Traction Bronchiectasis alteration’, ‘Sub pleural –bands’ & Architectura) between “COVID-19” & ”NON-COVID-19 cases (P less than 0.001), whereas Consolidation was non-significant.

Conclusion: A chest CT scan might be a dependable tool for COVID-19 cases diagnosis. Hematological features that include WBC, Neutrophils, Lymphocytes, Monocytes, Eosinophil, Basophils, MCV, MCH, PDW might be substantial indications for COVID-19 appraisal.

Keywords: COVID-19, NON-COVID-19, Pneumonia, CT scan, Hematological test, case-control study.

Introduction

〈Coronavirus〉 interactive 〈disease-2019〉 (COVID-19) is a pandemic outbreak produced by 〈severe acute respiratory syndrome〉 coronavirus-2 (SARS-CoV-2). It begins suddenly in December 2019

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in ‘Wuhan’ City, ‘China’, then spread in 213 countries characterized by a minor common cold-like sickness, to ‘severe viral-pneumonia’ might develop to ‘acute-respiratory-distress-syndrome’ that is possibly lethal\textsuperscript{1}).

RT-PCR sensitivity might be lower than 50% & certain diagnoses might be lost. Low sensitivity in ‘COVID 19’ early stage, the results of this test may take more than 24 hours, while the results of a CT scan are available immediately\textsuperscript{2}. RT-PCR test for SARS-CoV-2 viral RNA recognition is very specific but low sensitive\textsuperscript{3} as greatest of COVID-19 cases with duplication negative results. Chest CT scan lung findings are appear than clinical manifestations, which make Chest CT scan critical for runs and accurate diagnosis\textsuperscript{4}. So, CT scan might be applied as a supplementary diagnostic tool simultaneously in COVID-19 diagnosis\textsuperscript{2}.

Chest CT scans has high sensitivity with low specificity in COVID-19, so it is problematic to differentiate COVID-19 from non-COVID-19 pneumonia cases\textsuperscript{5,6}. Nevertheless, RT-PCR appear as negative results, while their CT imaging findings were abnormal as reported in certain study\textsuperscript{7,8,9,10}. Through using of chest CT scan findings with RT-PCR, the sensitivity could be reach to 99%, so chest CT scan should be used as a reference for COVID-19 diagnosis\textsuperscript{6}.

Chinese studies related to COVID-19 showed that there is a decrease in white blood cells in hospital patients, with varying degrees of decrease in lymphocytes with a relative decrease in platelets\textsuperscript{11}.

In Iraq, as far as we know, no previous study has yet compared chest CT scan and hematological investigation results between COVID-19 & non-COVID-19 viral pneumonia kinds. Thus, this study was the first research to compare chest CT scan findings & hematological features of COVID-19 & non-COVID-19 viral pneumonia kinds to know diagnostic efficacy of these tools in COVID–19 diagnosis.

Patients and Method

Prospective case-control design was used to identify the role, effectiveness and diagnostic accuracy of hematological tests with a chest CT scan for screening and rapid diagnosis of COVID-19 infections through compared the difference of Hematological tests and radiographic features results of “COVID-19” & "NON-COVID-19" viral pneumonia kinds. Twenty "COVID 19" together with pneumonia patients 28 other “NON-COVID-19” were confirmed simultaneously to be infected or not infected with SARS-CoV-2 respectively using RT-PCR & blood as a suitable specimen in Yarmouk teaching hospital, Baghdad, Iraq from 1 march to 31 April 2020, at the beginning of the outbreak in Iraq COVID-19. We analyzed the demographic, compare the pulmonary CT scan findings and hematological investigation among "COVID-19" & NON-COVID-19 Iraqi patients. Anbar medical College approved the protocol. All patients provided informed consent for participation in the study.

Statistical Analyses: Data were analyzed using IBM SPSS software version 22. The results were presented in tables as frequencies and percentages. Chi-Square test was used to compare between the variables through cross-tabulations and P-Value less than 0.05 considered a statistically significant difference

Results

Twenty COVID-19 confirmed cases with 28 chest pain non-COVID-19 cases (as a control) were enrolled in the study.

\textasciitilde‘COVID-19’ patients mean age was 62.10 ±14.308 SD ranged between 35 months and 90 years whereas ‘non COVID-19’ patients mean age was 61.07±13.638 SD, Age group had been categorized as following:

\begin{itemize}
  \item \textless= 43 (2, 10.0%);
  \item 44 – 59 (5, 25.0%);
  \item 60 – 74 (9, 45.0%);
  \item 75+ (4, 20.0%)
\end{itemize}

Fifteen (75.0%) of COVID-19 patients were identified during March and others 5 (25.0%) identified during April 2020.

\textbf{Table 1: Epidemiological characteristics of COVID-19 confirmed Patient diagnosed in Al-Yarmouk teaching hospital, Baghdad, Iraq}

<table>
<thead>
<tr>
<th>Character</th>
<th>Frequency (%) (N. 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean of age</td>
<td>62.10 ±14.308 SD</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>11 (55.0%)</td>
</tr>
<tr>
<td>Female</td>
<td>9 (45.0%)</td>
</tr>
<tr>
<td>Incidence in month</td>
<td></td>
</tr>
<tr>
<td>March</td>
<td>15 (75.0%)</td>
</tr>
<tr>
<td>April</td>
<td>5 (25.0%)</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
</tr>
<tr>
<td>\textless= 43</td>
<td>2 (10.0%)</td>
</tr>
<tr>
<td>44 – 59</td>
<td>5 (25.0%)</td>
</tr>
<tr>
<td>60 – 74</td>
<td>9 (45.0%)</td>
</tr>
<tr>
<td>75+</td>
<td>4 20.0%</td>
</tr>
</tbody>
</table>
Normal WBC average number (6.480/mcL in COVID-19 (20 [41.7%]) compare with elevation of WBC average number (10.193/mcL (28 [58.3%]) of NON-COVID-19 patients, significant difference of WBC average number of COVID–19 compare with NON–COVID–19 cases (P<0.001).

Lymphocytes were decreased in COVID-19(20[41.7%]) compare with NON-COVID-19 patients(P<0.001)(28 [58.3%]).

Decreased count or levels of Neutrophils, lymphocytes, Monocytes, Eosinophil and Basophil were observed in COVID-19 (4.500/mcL), (1.330/mcL) (0.350), (0.075) (0.035) respectively Compared to (6.679/mcL), (2.154/mcL), (0.782) (0.429), (0.150) respectively of NON-NCOVID-19 patients. A significant difference among Neutrophils, lymphocytes, Monocytes, Eosinophil and Basophil low levels of COVID-19 Compared to its counts in NON -COVID-19 patients (P<0.001).

Abnormally decreased Mean Corpuscular Volume (MCV) and corpuscular Hemoglobin (MCH) were seen in COVID-19 patients (85.360fL), (28.520pg) respectively Compared to its Mean (89.061fL), (29.939pg) respectively in NON-NCOVID-19 patients. A significant difference among decrease mean MCVand MCH of COVID-19 compared to its Mean in NON-NCOVID-19 patients (P<0.001) (Table 3).

Abnormally increased Platelet Distribution Width (PDW) was seen in COVID-19 patients (17.762%) compared to its percent (15.896%) in ‘non-COVID-19’ patients, a significant difference among increase PDW of COVID-19 Compared to its percent in NON-NCOVID-19 patients (P<0.001) (Table 3).

Whoever, non-significant difference amongst level of RBCs (P. Value 0.474), ‘hemoglobin’ (P. Value 0.135), ‘Hematocrit-test’ (P. Value 0.060), ‘Platelets Count’ (P. Value 0.121), ‘mean platelet volume’ (P. Value 0.710) & PCT levels (P. Value 0.372) of ‘COVID–19’ & ‘non–COVID–19’ patients.

Table 2: Statistical comparisons different among’ COVID–19’ & NON–COVID–19 (as Control) hematological parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Confirmed COVID–19, NON–COVID–19 cases (Total No.48)</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBC count</td>
<td>COVID–19</td>
<td>20</td>
<td>6.480</td>
<td>2.1910</td>
<td>0.4899</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Non–COVID–19</td>
<td>28</td>
<td>10.193</td>
<td>3.8400</td>
<td>0.7257</td>
<td></td>
</tr>
<tr>
<td>Neutrophils</td>
<td>COVID–19</td>
<td>20</td>
<td>4.500</td>
<td>2.0532</td>
<td>0.4591</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>Non–COVID–19</td>
<td>28</td>
<td>6.679</td>
<td>2.4524</td>
<td>0.4635</td>
<td></td>
</tr>
<tr>
<td>Lymphocytes</td>
<td>COVID–19</td>
<td>20</td>
<td>1.330</td>
<td>0.4566</td>
<td>0.1021</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>Non–COVID–19</td>
<td>28</td>
<td>2.154</td>
<td>1.0500</td>
<td>0.1984</td>
<td></td>
</tr>
<tr>
<td>Monocytes</td>
<td>COVID–19</td>
<td>20</td>
<td>0.350</td>
<td>0.0889</td>
<td>0.0199</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Non–COVID–19</td>
<td>28</td>
<td>0.782</td>
<td>0.2653</td>
<td>0.0501</td>
<td></td>
</tr>
<tr>
<td>Eosinophil</td>
<td>COVID–19</td>
<td>20</td>
<td>0.075</td>
<td>0.0786</td>
<td>0.0176</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Non–COVID–19</td>
<td>28</td>
<td>0.429</td>
<td>0.3516</td>
<td>0.0664</td>
<td></td>
</tr>
<tr>
<td>Basophils</td>
<td>COVID–19</td>
<td>20</td>
<td>0.035</td>
<td>0.0489</td>
<td>0.0109</td>
<td>0.008</td>
</tr>
<tr>
<td></td>
<td>Non–COVID–19</td>
<td>28</td>
<td>0.150</td>
<td>0.1816</td>
<td>0.0343</td>
<td></td>
</tr>
<tr>
<td>RBC level</td>
<td>COVID–19</td>
<td>20</td>
<td>4.6215</td>
<td>0.78433</td>
<td>0.17538</td>
<td>0.474</td>
</tr>
<tr>
<td></td>
<td>Non–COVID–19</td>
<td>28</td>
<td>4.7571</td>
<td>0.51742</td>
<td>0.09778</td>
<td></td>
</tr>
<tr>
<td>HB</td>
<td>COVID–19</td>
<td>20</td>
<td>12.640</td>
<td>1.9749</td>
<td>0.4416</td>
<td>0.135</td>
</tr>
<tr>
<td></td>
<td>Non–COVID–19</td>
<td>28</td>
<td>11.843</td>
<td>1.6428</td>
<td>0.3105</td>
<td></td>
</tr>
<tr>
<td>Hematocrit</td>
<td>COVID–19</td>
<td>20</td>
<td>39.605</td>
<td>6.1581</td>
<td>1.3770</td>
<td>0.060</td>
</tr>
<tr>
<td>test</td>
<td>Non–COVID–19</td>
<td>28</td>
<td>42.946</td>
<td>5.7403</td>
<td>1.0848</td>
<td></td>
</tr>
</tbody>
</table>
A Chest CT scan of COVID–19 patients with NON–COVID–19 patients had been shown in Figure 1,2,3 and Table 3.

Ground glass was present in 17/20 patients (85.0%) in COVID-19 confirmed cases, in 9/28 patients (32.1%) in NON-COVID-19 cases. Crazy paving was present in 15/20 patients (75.0%) in COVID-19 confirmed cases and only in 2/28 patients (7.1%) in Chest pain Unconfirmed COVID-19 cases. A significant difference was observed between the COVID-19 confirmed cases and Chest pain NON- COVID-19 cases regarding the ground glass and Crazy paving alteration (P Value= 0.000) Table 3.

Vascular dilatation was present in 12/20 patients (60.0%) in COVID-19 confirmed cases and only in 2/28 patients (7.1%) in Chest pain unconfirmed COVID-19 cases. Traction Bronchiectasis was present in 11/20 patients (55.0%) in COVID-19 confirmed cases and only in 3/28 patients (10.7%) in Chest pain unconfirmed COVID-19 cases. Subpleural bands and Architectural were present in 10/20 patients (50.0%) in COVID-19 confirmed cases and only in 3/28 patients (10.7%) in Chest pain unconfirmed COVID-19 cases Significant difference was observed between the COVID-19 confirmed cases and Chest pain unconfirmed COVID-19 cases regarding the Vascular dilatation, Traction Bronchiectasisalteration and Subpleural bands and Architectural (P Value= 0.000) Table 3.

Consolidation was present only in 4/20 patients (20.0%) in COVID-19 confirmed cases and only in 15/28 patients (53.6%) in Chest pain unconfirmed COVID-19 cases, non- significant difference had been observed between the COVID–19 confirmed cases and Chest pain unconfirmed COVID–19 cases regarding the Consolidation alteration (P Value= 0.035) Table 3.

Ground –glass opacity, Crazy– paving alteration, wide Vascular– dilatation, Traction-Bronchiectasis alteration, Sub –pleural–bands & Architecture finding of Chest CT the were significantly associated with COVID-19 pneumonia, whereas Consolidation was not significantly associated with COVID-19 pneumonia (P<0.001), so chest CT scan can be documented as a preliminary diagnostic tool of COVID .
Figure 1: A. COVID-19 positive CT picture of the crazy paving pattern, B. Segmental consolidation in a patient with severe chest infection COVID-19 negative patient.

Figure 2: A. Typical diffuse ground glass appearance with bilateral pleural effusion in COVID-19 positive patient, B. Nodular ground-glass pneumonitis with left pleural effusion COVID-19 negative patient.

Figure 3: A. Typical septal thickening with ground glass appearance in COVID-19 positive patient, B. Septal thickening and tree in bud pattern of trans-bronchial spread COVID-19 negative patient.
Table 3: Statistical comparisons of different chest CT scan radiological diagnostic features, lesions and imaging manifestations among COVID-19 confirmed cases & NON-COVID–19 (Control).

<table>
<thead>
<tr>
<th>Character</th>
<th>COVID–19 confirmed cases (N=20), frequency (%)</th>
<th>NON-COVID-19 cases (Control) (N=28), frequency (%)</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground glass</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive feature</td>
<td>17 (85.0%)</td>
<td>9 (32.1%)</td>
<td>0.000</td>
</tr>
<tr>
<td>Negative feature</td>
<td>3 (15.0%)</td>
<td>19 (67.9%)</td>
<td></td>
</tr>
<tr>
<td>Crazy paving</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive feature</td>
<td>15 (75.0%)</td>
<td>2 (7.1%)</td>
<td>0.000</td>
</tr>
<tr>
<td>Negative feature</td>
<td>5 (25.0%)</td>
<td>26 (92.9%)</td>
<td></td>
</tr>
<tr>
<td>Vascular dilatation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive feature</td>
<td>12 (60.0%)</td>
<td>2 (7.1%)</td>
<td>0.000</td>
</tr>
<tr>
<td>Negative feature</td>
<td>8 (40.0%)</td>
<td>26 (92.9%)</td>
<td></td>
</tr>
<tr>
<td>Traction Bronchiectasis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive feature</td>
<td>11 (55.0%)</td>
<td>3 (10.7%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Negative feature</td>
<td>9 (45.0%)</td>
<td>25 (89.3%)</td>
<td></td>
</tr>
<tr>
<td>Sub pleural bands and Architectural</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive feature</td>
<td>10 (50.0%)</td>
<td>3 (10.7%)</td>
<td>0.003</td>
</tr>
<tr>
<td>Negative feature</td>
<td>10 (50.0%)</td>
<td>25 (89.3%)</td>
<td></td>
</tr>
<tr>
<td>Consolidation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive feature</td>
<td>4 (20.0%)</td>
<td>15 (53.6%)</td>
<td>0.035</td>
</tr>
<tr>
<td>Negative feature</td>
<td>16 (80.0%)</td>
<td>13 (46.4%)</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

The current research aimed to show chest CT scan findings variance among COVID–19 & non–COVID–19 patients.

Current study revealed that chest CT scans can distinguish between COVID–19 from non–COVID–19 patience with in elevation specificity with a moderate sensitivity. This results had been agreement with the result reported by Bai et al. 2020[12].

The current study indicated that 85.0% of COVID19 showed initial abnormal CT scan findings, which supports the possibility of CT scan as an assisting diagnostic tool in addition to RT-PCR for COVID19 diagnosis. Most common CT scan finding or imaging in our patients was ground–glass & two-sided peripheral spreading. Current study had been similar to previous report that showed that ground–glass was a chief chest CT scan findings in COVID–19[13].

However, It is worth noting that a small number of COVID 19 patients in our current study did not have CT scan abnormal change and this is consistent with a previous study that showed that 11.5% of patients with confirmed infection with this disease showed normal chest CT scan finding[13], so we conclude that a CT scan
finding alone is not sufficient to fully exclude reliable and confirmed diagnosis of COVID-19, especially in the early stage of the disease.

Recent study that showed consolidation imaging not characteristic for COVID-19 pneumonia, these result was disagreement with the results reported by Pan et al. and Xie et al. that exhibited imaging consolidation as a characteristics for COVID-19 pneumonia.

The current study were consistent with the findings of previous report that showed crazy-paving patterns & diffuse distribution had been characteristic for CT findings of COVID-19 pneumonia.

Results of current study also in agreement with the result reported by previous study that demonstrate chest CT scan imaging are frequently normal in initial disease phases; nevertheless, it might demonstrate bilateral-infiltrates & ground-glass opacity in initial disease phases.

Results of the hematological finding in preset study was in agreement with results of previous study the presented varying degrees of laboratory abnormalities e.g. leukopenia, leukocytosis, lymphopenia among COVID-19 & non-COVID-19 such as leukopenia, leukocytosis & lymphopenia . etc.

Laboratory findings might be applied as an supplementary diagnostic tool simultaneously with chest CT scan imaging that acts mostly on lymphocytes which decrease during COVID-19 but it still normal in non-COVID-19.

We suggested that current research on CT scan findings and imagines have highlighted the chest CT scan role in pandemic COVID-19 diagnosis. Researches with big sample size & clear chest CT scan findings or imagines from different countries are required to guide usage of this tool in the COVID-19 diagnosis.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

Funding: Self-funding

References


Effects of Different Holding Temperatures before Freezing on the Quality of Bull Semen

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Abstract

A study was conducted to evaluate the effect of different holding temperature before freezing on the motility, morphology and viability of chilled and frozen spermatozoa. Semen was performed from four mature bulls by electro-ejaculator. After initial evaluation and first dilution using Tris-egg yolk semen extender, four groups of diluted semen samples were kept in four different holding temperatures (4°C, 15°C, 25°C and 37°C) for 10 minutes. All semen samples were subsequently chilled in refrigerator at 4°C for at least 3 hours. Post chilling evaluation was done after second dilution with the same extender added with glycerol. The semen samples were packed into 0.25 ml straws before freezing into liquid nitrogen. Thawing of frozen semen samples were done on day 1 post cryopreservation in water maintained at 37°C for 30 seconds. Semen evaluation was conducted post thawing. The results showed that there were no significant difference among the four different holding temperatures for the post chilling and frozen-thawed sperm motility, morphology and viability. Based on the findings of this study, it can be concluded that 10 minutes holding time at different holding temperatures before freezing did not affect the quality of chilled and frozen bull spermatozoa.

Keywords: Semen, holding temperature, bull, freezing.

Introduction

The development in cryopreservation technology is able to store frozen semen for extended period of time and used for insemination. Studies have been conducted in order to improve the techniques for collecting the maximum number of viable spermatozoa from the male through preservation of the semen quality by adding suitable media, providing appropriate cooling, freezing, storage and thawing procedures[1].

Baiee et al.[2] reviewed that cryopreserved spermatozoa are susceptible to the changes of their conditions during freezing, thawing and processing, in which causing reduced fertility as compared with raw semen[3]. Spermatozoa from many species such as buck[4], boars[5], stallions[6], rams[7] and deer[8] can be maintained at 4-15°C for time periods up to 24 h, depending on their species, before cryopreservation and still have acceptable frozen-thawed sperm quality. Moreover, bull sperm held at 4°C for 4 h maintain acceptable motility (52.5%)[9]. It might be that holding time prior to cryopreservation processing can have a useful effect since it has been shown that the incubation of semen before freezing has a beneficial effect [5]. This incubation could improve resistance of spermatozoa to cold shock. Furthermore, the incubation of semen can result in a reversion of sperm capacitation processes[10]. However, documentation concerning cryopreserving bull sperm following holding in different temperature have been limited. Therefore, by manipulating different
holding temperature of the semen before cryopreservation may produce different effect to the spermatozoa in terms of viability, motility and morphology before and after freezing. Thus, the main objective of this study was to determine the effect of different holding temperatures before freezing on the quality of cryopreserved bull semen.

**Materials and Method**

**Animal:** Four sexually mature Brangus cross bulls from Taman Pertanian Universiti, Universiti Putra Malaysia cattle farm were used for semen collection. The age of the bulls were within the range of 3 to 7 years old with body weights between 300 to 400 kg. These bulls were kept semi-intensively, fed with palm kernel cake and allowed to graze freely during the day. Commercial mineral block and water were given ad libitum. The sample collection was approved by Institutional Animal Care and Use Committee (IACUC; FYP.2016/ FPV13,31).

**Experimental design:** Semen samples were divided into four groups. First group, the controlled group was kept in refrigerator at 4°C. Second group was kept in a cool water bath at 15°C inside an insulated thermal box. The third group was put in a water bath at 25°C inside an insulated thermal box. The last group of samples was put in a warm water bath at 37°C. All groups were maintained at its respective temperatures 10 minutes before chilling.

**Semen collection and fresh semen evaluation:** In day of semen collection two semen samples were collected from two bulls using an automated electro-ejaculation method; two time per week. The collection was repeated four times to get a total of sixteen semen. The semen samples were evaluated immediately based on macroscopic (volume, consistency and colour) and microscopic (spermatozoa concentration, motility, morphology and viability) characteristics. The semen sample was diluted 1 to 40 ratios with normal saline at water bath of 37°C for initial evaluation. Evaluation of spermatozoa concentration and general motility were made by using a Computer Assisted Semen Analyzer (CASA). Spermatozoa morphology at 1000× magnification and viability at 400× magnification were evaluated using eosin-nigrosin stain. A total of 200 spermatozoa were examined under a light microscope. Dead spermatozoa were stained purple and live spermatozoa were unstained. Sperm abnormality was determined by examining 200 spermatozoa for defects associated with sperm head, mid-piece and tail.

Only semen sample that achieved the standard minimum criteria can be used for the experiment (Figure 1).

![Figure 1: The initial evaluation of collected semen, A (sperm motility, viability and Morphology of sperm), B (Concentration of sperm) and C (volume of semen).](image-url)
Cryopreservation procedure

Extender preparation: Two extenders were prepared one without glycerol for chilling period and another with glycerol was added after the end of chilling period, 2.42g of Tris, 1.48g of citrate, 1g of fructose (Sigma-Aldrich) and 20 ml of fresh egg yolk were mixed with distilled water to produce 100 ml of Tris-egg yolk extender. The same components with addition of 12.8ml glycerol were mixed with distilled water to produce 100 ml of Tris-egg yolk-glycerol extender[14].

Semen dilution, packing and freezing: The semen sample was pre-diluted with Tris-egg yolk extender at water bath of 37°C. Four semen groups from each bull were kept at different holding temperature of 4, 15, 25 and 37°C respectively for 10 minutes. Then, all semen samples were transferred for chilling at temperature of 4°C and kept for more than 3 hours. After 3 hours, all the semen samples were evaluated using CASA and stain with eosin-nigrosin to determine the sperm general motility, progressive motility, viability and morphology.

The pre-diluted semen sample was then diluted with Tris-egg yolk-glycerol extender as final dilution under temperature of 4°C. The extended semen was packed into 0.25ml labelled French straws and sealed with sealing powder. Then after, the straws were subject to a slow gradual freezing process manually before they were stored in a liquid nitrogen tank following the method described by[15].

Frozen-thawed semen evaluation: After 24 hours of storage, the straws were taken out from the liquid nitrogen tank and thawed in water bath with temperature of 37°C for 30 seconds. Then, the straws were cut and the semen samples were inserted into test tubes in the water bath with temperature of 37°C. All the post thawed semen samples were also evaluated using CASA and stain with eosin-nigrosin[12].

Statistical analysis: All the data were tested for normality by using Shapiro-Wilk Test. The result of post chilling and post thawing evaluation were analysed by Kruskal-Wallis H Test using IBM SPSS Statistics 22 software (SPSS Inc., Chicago, IL, USA). Mann Whitney U Test was used to analyse the relationship between different pairs of treatment groups.

Results

From the test of normality, Shapiro-Wilk Test showed that most of the data were not normally distributed, p<0.05. Therefore, relevant non-parametric tests were selected to analyse the data from the experiment. The result of Kruskal-Wallis H Test for the post chilling evaluation revealed that there were no statistically significant difference (p>0.05) in sperm viability, sperm general motility, sperm progressive motility and sperm normal morphology between the different holding temperatures (Tables 1 and 2).

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Post Chilling Evaluation (% ± SEM)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Viability</td>
</tr>
<tr>
<td></td>
<td>General Motility</td>
</tr>
<tr>
<td></td>
<td>Progressive Motility</td>
</tr>
<tr>
<td></td>
<td>Normal Morphology</td>
</tr>
<tr>
<td>4</td>
<td>66.38 ± 4.74</td>
</tr>
<tr>
<td></td>
<td>58.88 ± 12.42</td>
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<tr>
<td></td>
<td>16.00 ± 4.23</td>
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<tr>
<td></td>
<td>94.56 ± 3.10</td>
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<tr>
<td>15</td>
<td>66.75 ± 6.45</td>
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<tr>
<td></td>
<td>62.38 ± 10.32</td>
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<tr>
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<td>15.63 ± 3.47</td>
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<td>93.56 ± 2.40</td>
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<tr>
<td>25</td>
<td>68.88 ± 5.90</td>
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<td></td>
<td>65.25 ± 8.67</td>
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<td></td>
<td>16.50 ± 3.15</td>
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<tr>
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<td>95.50 ± 1.78</td>
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<tr>
<td>37</td>
<td>62.13 ± 5.17</td>
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<tr>
<td></td>
<td>62.50 ± 10.54</td>
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<tr>
<td></td>
<td>15.63 ± 3.04</td>
</tr>
<tr>
<td></td>
<td>96.00 ± 1.43</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post-Thawing</th>
<th>Temperature (°C)</th>
<th>N</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viability</td>
<td>4</td>
<td>16</td>
<td>16.81</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>16</td>
<td>17.88</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>16</td>
<td>18.31</td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>16</td>
<td>13.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>64</td>
<td></td>
</tr>
</tbody>
</table>
Besides, the result of Kruskal-Wallis H Test for the post thawing evaluation showed that there were no statistically significant difference in sperm viability, sperm general motility, sperm progressive motility and sperm normal morphology between the different holding temperatures, p>0.05 (Tables 3 and 4).

### Table 3: Mean value of post thawing evaluation of different holding temperature

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Viability</th>
<th>General Motility</th>
<th>Progressive Motility</th>
<th>Normal Morphology</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>58.25±7.29</td>
<td>32.13±9.06</td>
<td>6.25±2.34</td>
<td>96.00±2.37</td>
</tr>
<tr>
<td>15</td>
<td>56.63±4.18</td>
<td>27.63±6.74</td>
<td>4.63±1.48</td>
<td>96.25±0.97</td>
</tr>
<tr>
<td>25</td>
<td>56.38±5.05</td>
<td>31.88±6.84</td>
<td>5.13±1.77</td>
<td>95.69±1.77</td>
</tr>
<tr>
<td>37</td>
<td>55.88±5.58</td>
<td>36.63±9.61</td>
<td>7.00±2.26</td>
<td>95.06±2.23</td>
</tr>
</tbody>
</table>

### Table 4: Mean Ranks for post thawed evaluation of different holding temperatures

<table>
<thead>
<tr>
<th>Post thaw</th>
<th>Temperature</th>
<th>N</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viability</td>
<td>4</td>
<td>16</td>
<td>16.69</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>16</td>
<td>16.81</td>
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<tr>
<td></td>
<td>25</td>
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<td>16.63</td>
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<td>37</td>
<td>16</td>
<td>15.88</td>
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<tr>
<td>Total</td>
<td>64</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>General Motility</th>
<th>Temperature</th>
<th>N</th>
<th>Mean Rank</th>
</tr>
</thead>
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<tr>
<td></td>
<td>4</td>
<td>16</td>
<td>16.69</td>
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<tr>
<td></td>
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<td>16</td>
<td>16.81</td>
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<tr>
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<td>16.63</td>
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</tr>
<tr>
<td>Total</td>
<td>64</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
On the other hand, the result of Wilcoxon Signed Rank Test for the fresh semen evaluation and the post thawing evaluation showed that there were statistically significant differences (p < 0.05) in sperm viability, sperm general motility and sperm normal morphology. However, there was no statistically significant difference (p > 0.05) in sperm progressive motility.

From the result of Mann-Whitney U Test for the post chilling evaluation, there were no significant differences (p > 0.05) in sperm viability, sperm general motility, sperm progressive motility and sperm normal morphology between the holding temperature of 4°C and 15°C, 4°C and 25°C, 4°C and 37°C, 15°C and 25°C, 15°C and 37°C, 25°C and 37°C. Furthermore, the result of Mann-Whitney U Test for the post thawing evaluation showed that there were no significant differences (p > 0.05) in sperm viability, sperm general motility, sperm progressive motility and sperm normal morphology between the holding temperature of 4°C and 15°C, 4°C and 25°C, 4°C and 37°C, 15°C and 25°C, 15°C and 37°C, 25°C and 37°C.

### Discussion

In this study, Tris-egg yolk extender containing citrate and fructose as energy supplement to the spermatozoa were used to extend their life spans [16]. Approximately 20% of egg yolk in the extender is used as standard level for most case of bull semen cryopreservation [17]. Tris-egg yolk extender was not used as diluent during fresh semen evaluation because CASA may count the egg yolk granules from the Tris-egg yolk extender as individual sperm in which will affect the outcome.

After cooling the semen sample at 4°C in the refrigerator for more than 3 hours, Tris-egg yolk-glycerol extender was used to dilute the semen before packing for cryopreservation. Tris-egg yolk-glycerol extender gives excellent protection for sperm either frozen or unfrozen [18]. Spermatozoa are sensitive to the changes in the osmolality of the surrounding solution, in which they will lose their motility irreversibly if the osmolality is intolerable [19]. Therefore, we have to be aware of the dilution factor used to dilute the semen with extender for cryopreservation.

There were statistically significant differences in the quality of bull semen before and after cryopreservation. Cooling and freezing of spermatozoa during process of cryopreservation causes reduction of temperature of the spermatozoa and its surrounding solution. This change in temperature induces sperm plasma membrane damage which leads to a state of sperm abnormal morphology such as abnormal acrosome [13]. The damaged sperm plasma membrane allows influx of calcium ions which resulted in abnormally high amount of intracellular calcium ions in the spermatozoa. This phenomenon contributes to the premature capacitation of spermatozoa [20]. It had been reported that there was variation among individuals in the extent to which their spermatozoa are damaged by freeze-thawing [21]. This individual differences particularly for bull semen have been recorded and to cover this difference, freezing protocols were adjusted for individual bulls or packaging straws with more spermatozoa for “poor freezers”. The effect of different temperature to the quality of spermatozoa may be varies for different individuals from the same species. Therefore, the accuracy of result may be reduced due to this factor.

<table>
<thead>
<tr>
<th>Post thaw</th>
<th>Temperature</th>
<th>N</th>
<th>Mean Rank</th>
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<td></td>
<td>37</td>
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<td>17.81</td>
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<table>
<thead>
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<th>Temperature</th>
<th>N</th>
<th>Mean Rank</th>
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<tr>
<td><strong>Total</strong></td>
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<td>64</td>
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</table>
Conclusion

In this study, it can be concluded that different holding temperatures before freezing do not affect the quality of bull semen significantly. However, the process of cooling and freezing during cryopreservation affects the quality of bull semen significantly. Besides, more time and numbers of suitable samples should be required to improve this study. These will allow for more tests to be conducted for different parameters and more samples can be processed. Further investigation regarding the effect of different holding temperature before freezing should be done.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: Non

Funding: Self-funding

References


Maternal Hemoglobin Concentration and Pregnancy Outcome in a Sample of Iraqi Women

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Abstract

Aim of study: To analyze the maternal and perinatal outcome in varying degree of anemia and assess which level of hemoglobin concentration has best pregnancy outcome in Iraqi women.

Patients and Method: A cohort study that was conducted at Al-Elwiya Maternity Teaching Hospital during the period from 1st of Dec 2017 till end of Dec 2019. It included 500 pregnant women who were followed up in labor until delivery and their maternal and perinatal outcome were noted. Hemoglobin and MCV of each pregnant woman were measured at late second and third trimester. Hemoglobin groups were related to the maternal characteristics, delivery characteristics and pregnancy outcome. The patients underwent a complete blood count, blood film examination and hematocrit estimation.

Results: In this study, 33.4% of study participants had mild anemia and 22% of them had normal hemoglobin and MCV. Incidence of adverse perinatal outcome was 32.6% and adverse maternal outcome was 11.8%. Maternal hemoglobin and MCV levels are significantly affected by mother’s age. Hemoglobin level is also affected by parity while MCV level doesn’t. Low maternal hemoglobin was associated with increased risk of poor birth outcomes including LBW, preterm birth and adverse maternal health outcomes, including cesarean section and induction of labor.

Conclusion: Maternal anemia is strongly associated with several different types of maternal morbidity and perinatal morbidity.

Keywords: Anemia, pregnancy, hemoglobin, outcome, Iraq.

Introduction

Anemia has been a global health burden since it can affect anyone without considering age or gender group⁽¹⁾. It is an important global health problem affecting nearly 529 million women of reproductive age, including 38% of all pregnant women⁽²⁾. An average of 56% of pregnant women in developing countries are anemic⁽³⁾. Once pregnant women suffer from anemia, iron deficiency (IDA) becomes the most common cause that should be considered⁽⁴⁾. Other risk factors are unhealthy lifestyle, poor socio-economic status, malnutrition, hemoglobinopathies, age (< 20 years or > 35 years), early marriage or teenage pregnancy, decreasing period of pregnancy interval, smoking or alcohol use, history of menstrual disorder or infection and gemelli or multiple pregnancies⁽⁵⁾. According to the WHO guidelines, hemoglobin values between 10 and 10.9 g/dl are considered mild anemia, moderate anemia between 7 and 9.9 g/dl and severe anemia below 7 g/dl⁽⁶⁾.

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During pregnancy, there is an increase in both red cell mass and plasma volume to accommodate the needs of the growing uterus and fetus\(^7\). The plasma volume increases more than the red cell mass does, leading to a fall in the concentration of Hb in the blood, despite an increase in the total number of red cells. This drop in Hb concentration decreases blood viscosity and is thought to enhance placental perfusion, providing better maternal-fetal gas and nutrient exchange\(^8\). In the case of IDA during pregnancy, there are several possible risks to the mother, including increased fatigue, short-term memory loss, decreased attention span and decreased performance at work, increased pressure on the cardiovascular system due to insufficient Hb and low blood oxygen saturation levels, lower resistance to infections and a reduced tolerance to significant blood loss and to surgical interventions during labor\(^9\). The presumed risks of IDA for the fetus relate to the fact that low iron levels increase the risk of reduced Hb levels and therefore oxygen, to the uterus, placenta and the fetus during development\(^10\). Moreover, iron-deficient neonates have been shown to have a statistically significant increment in both cognitive and behavioral abnormalities up to 10 years after iron repletion\(^11\). IDA, even if mild to moderate, can be associated with unfavorable obstetric outcomes, notably, premature birth, low birth weight and fetal death\(^12\). Although IDA lead to serious consequences for health and well-being, there is currently a lack of available Iraqi data on these conditions in pregnancy. The aim of the current study was to analyze the maternal and perinatal outcome in varying degree of anemia and assess which level of Hb concentration has best pregnancy outcome in Iraqi women.

**Patients and Method**

**Study design, setting:** This was a cohort study that was conducted in the Department of Obstetrics and Gynecology at Al-Elwiya Maternity Teaching Hospital during the period from 1\(^{st}\) of Dec 2017 till end of Dec 2019.

**Study Population and sample size:** The study included 500 pregnant women who were attending the Department of Obstetrics during the period of study, followed up in labor until delivery and their maternal and perinatal outcome were noted.

History and examination were performed and maternal blood sample was taken. Hb and MCV of each pregnant woman were measured at enrolment in the obstetric unit at late second and third trimester.

On the basis of hemoglobin levels and MCV performed by the method; Electronic coulter cell counter.

They were grouped into five categories based on WHO definition:

- **Group I:** normal hemoglobin Hb≥11 g/dl + Normocytic.
- **Group IIA:** mild anemia Hb, 9–10.9 g/dl + Normocytic.
- **Group IIB:** mild anemia Hb, 9–10.9 g/dl + Microcytic.
- **Group III:** moderate anemia, Hb 7–8.9 g/dl + Microcytic.
- **Group IV:** Hb, less than 7 g/dl + Microcytic.

Microcytic RBC = MCV < 84fl.

Then these Hb groups were related to the maternal characteristics (age, Parity, Gestational age at delivery, hypertensive disorders in pregnancy and preterm labor), delivery characteristics (induction of labor, caesarean section, Postpartum hemorrhage ± blood transfusion) and pregnancy outcome (Apgar Score at 5 min, birthweight, IUGR, still birth, early neonatal death and birth asphyxia). Gestational age was determined on the basis of information on menstrual history and physical examination as well as early U/S to confirm the dating.

Low birth weight was defined as less than 2500 g and babies were classified as preterm if the gestational age was less than 37 weeks and as growth restricted if below the 10\(^{th}\) percentile of the birthweight-for gestational age using completed weeks of gestation according to the WHO recommendation. Early neonatal death (death among new born infant within 7 days of life). Still birth (infants were delivered without heart rate, apnea, limp, pale and cyanosed). Patient with chronic illness were excluded from the study.

The patients underwent a complete blood count, blood film examination and hematocrit estimation.

**Statistical analysis:** The data analyzed using Statistical Package for Social Sciences (SPSS) version 25. The data presented as mean, standard deviation and ranges. Categorical data presented by frequencies and percentages. Independent t-test and Analysis of
Variance (ANOVA) (two tailed) was used to compare the continuous variables accordingly. Chi square test was used to assess the association between adverse perinatal and maternal outcomes with mother’s blood (Hb + MCV) categories. A level of P – value less than 0.05 was considered significant.

Results

In this study, 500 pregnant women were enrolled. Maternal age was ranging from 16 to 44 years with a mean of 25.6 ± 8.13 years. Most of them lived in urban area (80.4%); 57.2% were housewives; and 83.2% had less than four children. As shown in figure 1, 33.4 % of study participants had mild anemia (hypochromic, normocytic) and 22% of them had normal Hb and MCV.

![Figure 1: Distribution of the study sample according to the level of blood indices](image)

Regarding adverse perinatal outcome, the incidence was 32.6% and preterm labor was the most common (24.6%); while the incidence of adverse maternal outcome was 11.8% and cesarean section was the most common (8.2%) as shown in table (1).

Table 1: The incidence of selected adverse perinatal and maternal outcome

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. (n= 500)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adverse perinatal outcome</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preterm labor</td>
<td>123</td>
<td>24.6</td>
</tr>
<tr>
<td>Low birthweight</td>
<td>88</td>
<td>17.6</td>
</tr>
<tr>
<td>APGAR score &lt; 8 at 5 mints.</td>
<td>24</td>
<td>4.8</td>
</tr>
<tr>
<td>IUGR</td>
<td>22</td>
<td>4.4</td>
</tr>
<tr>
<td>Birth asphyxia</td>
<td>20</td>
<td>4.0</td>
</tr>
<tr>
<td>Neonatal death</td>
<td>15</td>
<td>3.0</td>
</tr>
<tr>
<td>Still birth</td>
<td>11</td>
<td>2.2</td>
</tr>
<tr>
<td>At least one adverse perinatal outcome</td>
<td>163</td>
<td>32.6</td>
</tr>
<tr>
<td><strong>Adverse maternal outcome</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cesarean section</td>
<td>41</td>
<td>8.2</td>
</tr>
<tr>
<td>Induction of labor</td>
<td>39</td>
<td>7.8</td>
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</table>
Tables 2 and 3 show that maternal Hb and MCV levels are significantly affected by mother’s age. Hemoglobin level is also affected by parity while MCV level doesn’t.

**Table 2: Comparison in mean of mother’s blood Hb according to age and parity**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mother’s blood Hemoglobin concentration (gm/dl)</th>
<th>P - Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Range</td>
</tr>
<tr>
<td>Age (Years)</td>
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</tr>
<tr>
<td>&lt; 25</td>
<td>10.2 ± 1.3</td>
<td>7.0 – 15.0</td>
</tr>
<tr>
<td>≥ 25</td>
<td>8.8 ± 1.4</td>
<td>6.5 – 13.0</td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 4</td>
<td>9.5 ± 1.5</td>
<td>6.8 – 14.0</td>
</tr>
<tr>
<td>≥ 4</td>
<td>8.8 ± 1.9</td>
<td>6.5 – 15.0</td>
</tr>
</tbody>
</table>

**Table 3: Comparison in mean of mother’s blood MCV according to age and parity**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mother’s blood MCV (fL)</th>
<th>P - Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Range</td>
</tr>
<tr>
<td>Age (Years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 25</td>
<td>86.1 ± 7.4</td>
<td>66 – 98</td>
</tr>
<tr>
<td>≥ 25</td>
<td>81.9 ± 11.1</td>
<td>62 – 101</td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 4</td>
<td>83.6 ± 8.9</td>
<td>66 – 99</td>
</tr>
<tr>
<td>≥ 4</td>
<td>83.7 ± 14.1</td>
<td>62 – 101</td>
</tr>
</tbody>
</table>

As shown in table 4, mean birthweight was at highest value (3699.9 g) in group-II A and declines with reducing blood Hb of mother to reach its lowest value (2503.1 g) in group-IV and this difference in mean birthweight between mother’s blood (Hb+MCV) categories was statistically significant.

**Table 4: Comparison in mean birthweight by mother’s blood (Hb+MCV) categories**

<table>
<thead>
<tr>
<th>Mother’s blood (Hb + MCV) categories</th>
<th>Birthweight (gm)</th>
<th>P - Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Range</td>
</tr>
<tr>
<td>Group I</td>
<td>3179.0 ± 692.2</td>
<td>2000 - 4360</td>
</tr>
<tr>
<td>Group II A</td>
<td>3699.9 ± 472.2</td>
<td>3000 - 4996</td>
</tr>
<tr>
<td>Group II B</td>
<td>2888.6 ± 560.8</td>
<td>1950 - 3846</td>
</tr>
<tr>
<td>Group III</td>
<td>3000.0 ± 530.2</td>
<td>1800 - 4200</td>
</tr>
<tr>
<td>Group IV</td>
<td>2503.1 ± 477.7</td>
<td>1750 - 3250</td>
</tr>
</tbody>
</table>
As shown in table 5, the highest prevalence of preterm labor (28.5%), IUGR (40.9%), APGAR score < 8 (37.5%), cesarean section (29.3%), induction of labor (33.3%) and both at least one adverse perinatal and maternal outcomes were seen in patients with category IV of blood Hb + MCV (31.3% and 27.1% respectively) with significant associations (P < 0.05) between preterm labor, IUGR, APGAR score, cesarean section, induction of labor and both adverse perinatal and maternal outcomes with mother’s blood (Hb + MCV) categories.

### Table 5: Association between mother’s blood (Hb + MCV) categories and certain adverse outcome

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mother’s blood (Hb + MCV) categories</th>
<th>Total (%) n = 500</th>
<th>P - Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IV (%) n = 64</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>III (%) n = 94</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IIB (%) n = 65</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IIA (%) n = 167</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I (%) n = 110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preterm labor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>35 (28.5)</td>
<td>123 (24.6)</td>
<td>0.001</td>
</tr>
<tr>
<td>No</td>
<td>29 (7.7)</td>
<td>377 (75.4)</td>
<td></td>
</tr>
<tr>
<td>IUGR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9 (40.9)</td>
<td>22 (4.4)</td>
<td>0.001</td>
</tr>
<tr>
<td>No</td>
<td>55 (11.5)</td>
<td>478 (95.6)</td>
<td></td>
</tr>
<tr>
<td>Neonatal death</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>5 (33.3)</td>
<td>15 (3.0)</td>
<td>0.06</td>
</tr>
<tr>
<td>No</td>
<td>59 (12.2)</td>
<td>485 (97.0)</td>
<td></td>
</tr>
<tr>
<td>APGAR Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 8</td>
<td>9 (37.5)</td>
<td>24 (4.8)</td>
<td>0.001</td>
</tr>
<tr>
<td>≥ 8</td>
<td>55 (11.6)</td>
<td>476 (95.2)</td>
<td></td>
</tr>
<tr>
<td>Cesarean section</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>12 (29.3)</td>
<td>41 (8.2)</td>
<td>0.014</td>
</tr>
<tr>
<td>No</td>
<td>52 (11.3)</td>
<td>459 (91.8)</td>
<td></td>
</tr>
<tr>
<td>Induction of labor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>13 (33.3)</td>
<td>39 (7.8)</td>
<td>0.001</td>
</tr>
<tr>
<td>No</td>
<td>51 (11.1)</td>
<td>461 (92.2)</td>
<td></td>
</tr>
<tr>
<td>At least one adverse perinatal outcome</td>
<td></td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>51 (31.3)</td>
<td>163 (32.6)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>13 (3.9)</td>
<td>337 (67.4)</td>
<td></td>
</tr>
<tr>
<td>At least one adverse maternal outcome</td>
<td></td>
<td>0.003</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>16 (27.1)</td>
<td>59 (11.8)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>48 (10.9)</td>
<td>441 (88.2)</td>
<td></td>
</tr>
</tbody>
</table>

**Discussion**

Anemia in pregnancy is a worldwide phenomenon particularly severe in the developing world\(^{(13)}\). In our study, the prevalence of anemia according to WHO definition is 78%. Modified definition of anemia prevalence after adjusting for MCV is 44.6%, we divide group II (9-10.9%) according to MCV into normocytic (MCV ≥ 84 fl) which is partly due to a hemodilution occurring at the late second and early third trimester and microcytic <84 fl which is probably indicates IDA. The current study showed that low maternal Hb was associated with increased risk of poor birth outcomes including LBW, preterm birth and adverse maternal health outcomes, including cesarean section and induction of labor. Our results agreed with
findings from a previous meta-analysis studies done by Xiong Xet al 2000 and by Sukrat B et al 2013 showing that low hemoglobin concentration in early pregnancy (<20 weeks gestation) was associated with preterm labor and LBW(14, 15). This is not surprising as poor placental and neonatal development in anemia due to inadequate oxygen supply to the fetus across the placentas and the oxygen supply may have a direct bearing on the development of IUGR(16,17). A study done by Malhotra M et al 2002 agreed with this study when showed that cesarean section and induction of labor were highest in severe anemia(18). These might be explained by that the duration of labor increased progressively with increasing severity of anemia in both induced and spontaneous labor. In addition to the occurrence of uterine inertia in the mothers with low Hb concentration and increased rate of operative vaginal delivery in severe anemia due to maternal exhaustion and fetal distress. We had found that the age and parity showed statistically significant difference among groups; which probably due to the effect of repeated pregnancies on the development of anemia in subsequent pregnancy as it was evident in our results that those with parity greater than four tend to have more severe anemia. Hb concentration is affected by parity, this is might be explained by that most women enter pregnancy with little or no iron reserve compounded by closely spaced pregnancies, prolonged period of lactation and blood loss by post-partum hemorrhage(19).

In conclusion, we can conclude that maternal anemia is strongly associated with several different types of maternal morbidity and perinatal morbidity. Pre and antenatal treatment of anemia has the potential to improve outcomes for affected women and their fetuses and neonates.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

Funding: Self-funding

References
and low birth weight: A cross sectional study from Jharkhand, India. One Health. 2019;8:100098-


Tb Laboratory Diagnosis, a Comparative Study in Baghdad, Iraq

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Abstract

Background: Tuberculosis is an infectious contagious disease caused primarily by Mycobacterium tuberculosis. The probability of developing TB disease is much higher among people with risk factors. Iraq was classified the seventh country in Middle East Asia that related to the high burden of tuberculosis. Many laboratory tests are used in diagnosis of TB. The study aimed to compare the results of AFB sputum test, sputum culture, Gene-expert automated system PCR and IGRA test for interferon Gamma in TB patients.

Aims of the Study: This study aimed to compare between efficiency of TB diagnostic tests: AFB, IGRA, IgG, IgM, Gen X pert PCR & Culture on LJ. medium used in TB. Patients attended private Clinics In Baghdad, Karch Sector, IRAQ.

Patients and Method: In a Descriptive study, one hundred fifty four (154) suspected TB patients were attending Lagash Private Clinic in Baghdad, Capital of IRAQ during the period from January 2017 to December 2019. All patients were examined by well expert physician’s senior specialist, requested clinical, chest x-ray and lab investigations AFB, IGRA, IgG, IgM, Gen X pert PCR & Culture on LJ medium were done.

Results: Patients were showing different rates of positive tests regarding their age, all patients were showing positive IGRA followed by IgM and PCR tests. While culture and AFB tests were showing the lowest rate in the studied patients sample. Gender showed no effect on the tested parameters used for TB study. We recommend depending IGRA, PCR for the rapid diagnosis of TB.

Keywords: TB, gene x pert, AFB, IGRA, TB IgM.

Introduction

Tuberculosis is an infectious contagious disease caused primarily by Mycobacterium tuberculosis. The probability of developing TB disease is much higher among people with risk factors. There is an increasing rate of the drug-resistant tuberculosis strains toward the drugs for curing of tuberculosis in large sector of risky groups, the problems of emergency multi-drug resistant TB (MDR) is major conflict in the world. TB is remaining one of the major contagious bacterial diseases around the World, in 2014, Iraq was classified the seventh in country, in Medial East Asia (MEA) that related to the high burden of tuberculosis. Symptoms of pulmonary tuberculosis which includes chest pain, cough, bloody sputum, night sweating and fever are highly observed in such cases. And about 10 % of all (PTB) seem asymptomatic. When Mycobacterium tuberculosis spreads outside the lungs producing different type of TB, the most common types of extra-pulmonary tuberculosis are pleural TB, tuberculosis meningitis, lymphatic system (especially around the neck), Urogenital tuberculosis and the bones or joints. AFB sputum test remains a faster screening diagnostic test for TB and dependent by WHO through DOTS TB control program in endemic countries. The classical cultivation method on (Lowenstein-Jensen medium) remained as a gold standard to diagnose TB.
Bacilli and to estimate the drug susceptibility DST, but this method is time-consuming (weeks to months). So many new laboratory techniques have been developed by World Health Organization (WHO) to fasten the diagnosis and detection of drug resistance of TB bacilli, these new laboratory method included phenotypic method (liquid culture) such as BacTec MGIT 960 and genotypic method (Molecular PCR Technique) by Gene Xpert system and Line Probe Assay\(^{(14-16)}\). Although microscopy and culture remain necessary for treatment monitoring, now global use of rapid molecular tests and automated cultivation systems are increasing, many countries are phasing out the use of smear microscopy for diagnostic purposes\(^{(17)}\). So this study is devoted to compare the significance of AFB, IGRA, IgG, IgM, Gene Xpert PCR & culture on LG medium in diagnosis of TB patients attending private clinics.

**Patients and Method**

In a Descriptive study, one hundred fifty four (154) suspected TB patients were attending Lagash Private Clinic in Baghdad, Capital of IRAQ during the period from January 2017 to December 2019. Considering research ethics, a written consent was done for each patient. All patients were examined by well expert physician’s senior specialist and each patient was submitted to the routine chest exam and requested clinical, chest x-ray and lab required investigations. Inclusion criteria were followed like patients with high risk for TB and patients with extra pulmonary TB were included in this study. Exclusion criteria were followed like patients with other affections like CA lung and tumors of other sites of respiratory diseases, patients with autoimmune diseases like SLE In additions to that patients with any infection causes confusion with TB are excluded in this study. Sputum specimens, Serum, blood were taken from each patient and examined as soon as possible in Lagash Private Clinical Laboratory for Clinical investigations. Each specimen was manipulated following optimal method for each technique; AFB staining technique was done for each sputum and pleural specimen as well as cultivation on LJ. Medium following\(^{(12-13)}\). Test for Interferon Gama (IGRA) ELISA test was done for each serum specimen following instructions of manufacturing company (Sigma). Gene Xpert test (PCR) Test was done for each blood specimen following instructions of the manufacturing company (Gene Xpert MTB/RIF, USA). Direct examination (AFB) test was done for each specimen following\(^{(12)}\)Guidelines for sputum examination. Data were reported and analyzed using SPSS program Version 2.

**Results and Discussion**

It is found that IGRA test showed highest ratio (40.5%) of positive result followed by PCR (30.7%) and IgG (28.8%), (Fig-1).

This was in accordance with the findings of\(^{(18)}\), this was might be attributed to the high sensitivity of IGRA test. Non-significant difference (p ≤ 0.5) was found between IGRA and PCR positive ratio (Fig-1). This was attributed to sensitivity and specificity of these tests. Low ratio of positive IgM and culture (7.8%) and
(9.8%) for each respectively, this can be explained by the fact that the peak of IgM arise in the acute reaction then undergo a decline at the same time IgG undergoes an increase and show sharp increase in chronic status\(^{(19)}\). So the low ratio of IgM was found due to the decline of this immunoglobulin in chronic disease like TB without relapse(TB Immunity\(^{(20)}\). Very low ratio(0.7%) positive AFB test was might be attributed to the low bacilli number in sputum specimens and majority of patients were treated so they were showing reduced bacilli number in their sputum specimens. AFB test requires at least 1000-2000 bacterial cells per gram of sputum to give positive results\(^{(4,12,13)}\), (Fig-1).

Regarding age group, it was found that significant difference was found between age groups in IGRA & IgG results\( (P \leq 0.0001) \) & \( (p \leq 0.017) \), patients within age group \( \geq 60 \) years old patients were showing highest ratio of IGRA & IgG positive tests results \( (51.6\%) \) & \( (48.4\%) \) for each respectively Table This was in accordance with the findings of\(^{(20-21)}\).

Table 1: Lab tests results regarding Age groups of patients.

<table>
<thead>
<tr>
<th></th>
<th>&lt;40y</th>
<th></th>
<th>40—59</th>
<th></th>
<th>( \geq 60 )</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>AFS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>1</td>
<td>2.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Negative</td>
<td>35</td>
<td>97.2</td>
<td>55</td>
<td>100</td>
<td>62</td>
<td>100</td>
</tr>
<tr>
<td>IgM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
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<td>5</td>
<td>9.1</td>
<td>5</td>
<td>8.1</td>
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<tr>
<td>Negative</td>
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<td>90.9</td>
<td>57</td>
<td>91.9</td>
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<td>Positive</td>
<td>3</td>
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<td>48.4</td>
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<tr>
<td>Negative</td>
<td>33</td>
<td>91.7</td>
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<td>51.6</td>
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<tr>
<td>Positive</td>
<td>8</td>
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<td>22</td>
<td>40.0</td>
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<td>Negative</td>
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<td>60.0</td>
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<tr>
<td>Culture</td>
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</tr>
<tr>
<td>Positive</td>
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<tr>
<td>Positive</td>
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<td>38.2</td>
<td>19</td>
<td>30.6</td>
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<tr>
<td>Negative</td>
<td>29</td>
<td>80.6</td>
<td>34</td>
<td>61.8</td>
<td>43</td>
<td>69.4</td>
</tr>
</tbody>
</table>

*Significant difference between proportions using Pearson Chi-square test at 0.05 level.

Patients within age group 40-59 years old were showing highest ratio (38.2%) of positive PCR test followed by the age group \( \geq 60 \) years (30.6%).

Patients less than 40 years old were showing the lowest positive results of the above mentioned tests (Table-1). This can be explained by the fact that increased rate of TB infection with age increase\(^{(6-21)}\) due to the potency of BCG vaccine undergo decrease with higher age so the infective rate will be higher in the age group \( \geq 60 \) year followed by 40-59 years old (Table-1). All patients showed positive IGRA and PCR tests patients were showing positive IgM (100%). Sera from TB culture positive patients were showing more positive IgM than sera from culture negative specimens, (25%) & (8.5%) for each respectively, this was in accordance with the finding of\(^{(6)}\) (Table-2).

Adult patients within the age group 46-60 years old were showing the highest rate of positive AFB and gene expert results Followed by the findings of patients within the age group 18-30 years old for AFB and Gene Expert. This was in accordance with the findings of\(^{(20)}\) in Baghdad. This is might be due to the reactivation of childhood TB among individuals within age group 45-60 years old patients\(^{(4)}\).
This indicates the early stage of infection IgG positive results were showing more IgM positive results patients (Table-2). Results of this study showed that high ratio of positive IGRA, PCR, IgM and culture results were showing higher positive IgG results,(75%, 52%,25%,20%)for each respectively(P≤00 (Table-3). Regarding IGRA test, 75.8% of positive PCR test patients were showing positive IGRA test, while 53.2% of IgG positive patients were showing positive IGRA test.

Followed by culture and IgM positive patients, 24.25 and 19.4% of them were showing IGRA test respectively (Table-3).

Regarding IGRA test, all patients with positive culture were showing positive PCR tests. This was due to the high relation between the two tests. All patients with IGRA positive results were showing positive PCR test, this means positive relation between two tests (Table-4).
**Table 4: Relation between PCR and other tests.**

<table>
<thead>
<tr>
<th></th>
<th>PCR Positive</th>
<th>PCR Negative</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>%</td>
<td>No</td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Positive</td>
<td>1</td>
<td>2.1</td>
<td>-</td>
</tr>
<tr>
<td>Negative</td>
<td>46</td>
<td>97.9</td>
<td>106</td>
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<tr>
<td>IgM</td>
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</tr>
<tr>
<td>Positive</td>
<td>12</td>
<td>25.5</td>
<td>-</td>
</tr>
<tr>
<td>Negative</td>
<td>35</td>
<td>74.5</td>
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<tr>
<td>IgG</td>
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<tr>
<td>Positive</td>
<td>23</td>
<td>48.9</td>
<td>21</td>
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<tr>
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<td>24</td>
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<tr>
<td>Positive</td>
<td>47</td>
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<td>Negative</td>
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<td>91</td>
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<tr>
<td>Culture</td>
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<tr>
<td>Positive</td>
<td>15</td>
<td>31.9</td>
<td>-</td>
</tr>
<tr>
<td>Negative</td>
<td>32</td>
<td>68.1</td>
<td>106</td>
</tr>
</tbody>
</table>

*Significant difference between proportions using Pearson Chi-square test at 0.05 level.

The same interpretation is acceptable for Gene Expert test was the presence of adequate bacterial cells of Mycobacterium tuberculosis in sputum to show positive Gene Expert system DNA test results. Similar results were nearly obtained by Al-Ouqaili et al 2018. Who use PCR test on sputum specimens from patients in Ramadi City, west of Iraq. The study concluded that AFB and Gene Expert tests are suitable tests for the identification of TB infection in adults and children above 6 years due to easy sampling of sputum suitable for these tests. In conclusion, patients were showing different rates of positive tests regarding their age, most of patients were showing positive IGRA followed by IgM and PCR tests. While culture and AFB tests were showing the lowest rate in the studied patient sample. Gender showed no effect on the tested parameters used for TB study. We recommend use depending IGRA and PCR method for the diagnosis of TB. In the same time, dependable test depends on the age and stage of disease. Tb is endemic disease in Iraq like hydatid cyst and brucellosis.(25,26)

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

**References**

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Incidence and Risk Factors of Neonatal Mortality at Alramadi Teaching Hospital for Maternity and Childhood: A Cross Sectional Study

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Abstract

Objective: To estimate neonatal mortality rate and determine major risk factors that contribute to neonatal mortality at alramadi teaching hospital for maternity and childhood.

Method: A prospective cross sectional study including 3654 neonate admitted to neonatal care unit at alramadi teaching hospital for maternity and childhood. To investigate the prohibition of death neonatal we performed a logistic recession with an odds ratio estimation for the deferent of weight birth maternal education, cause of admission and place of delivery, as well as the estimate of additive and multiplicative interaction.

Results: Data reveals the The incidence of neonatal death was 9.2%. It was higher in those with birth weight below 1.5 kg this means that low birth weight have higher chance of death with OR and C.I of (3.7 & 2.18–6.07) respectively. Also mothers with low education levels have higher chance of loosing their newborn baby with OR and C.I of (2.56 & 1.06 – 4.29) respectively. Home delivery with midwife interference and sepsis also have strong association with neonatal death with OR (2.15 & 6.82) respectively.

Conclusion: This is the first study done at Neonatal care unit of alramadi teaching hospital for maternity and childhood which analyze risk factors that highly contribute to neonatal death at that hospital. Determination of risk factors of neonatal death will help medical staff to reduce it through managing the avoidable risks like sepsis and educating the society about the importance of hospital delivery.

Keywords: Mortality, neonatal, death rate, sepsis, low birth weight, home delivery, Neonatal care unit (NCU).

Introduction

The period neonatal (the first 28 days of life) considered so critical period in life possibly due to diseases threatening newborn’s life and complexity process adaptive of the newly delivered(¹-³). Universally appear that 2.8 million deaths happened in newborns in 2013, consider the 44% of deaths in under-fives (⁴). There is clue proposition,a fast comparatively drop in the universal under-5 death-rate compared to the universal newborn mortality (yearly reduction rates 4.9% vs. 2.9%) among the year 2000 and 2013(⁴).

To prevent and adequately treat the utmost very important complications of birth preterm asphyxia birth and sepsis neonatal, which account collectively for three-quarter of deaths neonatal globally(⁴). The former articles from urban Cameroon cited contagion, risks of premature delivery,congenital malformations and birth asphyxia as the large causes of the hospital
neonatal mortality\(^{(5-7)}\). The styles of neonatal death-rate are valuable index of the fineness of obstetrical and care neonatal in a special check and the estimate include the rating of the fineness of health care\(^{(8-11)}\). Infant death-rate and child death-rate are mostly considered as indicators sensitive of the status health not only of children, but all populations\(^{(12-14)}\). Very early death in newborns is any kind of newly delivered death-rate which happens during the initial 24 h following birth\(^{(15)}\). (WHO), in countries developing among 25 and 45% of neonates die within the initial 24 h after birth\(^{(16)}\). Studies from Ghana appear that universal mortality in very early newborns was 16% per 1000 deliveries\(^{(17)}\). Very early neonatal risk factors for example, prematurity, low-birthweight, infections, hypothermia, asphyxia, meconium stained and birth injury raised the hazard of very early newborn death\(^{(18)}\). Newborn size is an important indicator of infant survival and childhood mortality. Accurate and Simple method of appreciate weight of newborn that can be readily exercised, to all pregnancies and consider method important of decreasing death-rate. Many researchers appear that depressed weight of the birth is linked with rise prenatal death-rate and morbidity\(^{(19)}\). At last years techniques ultrasound improve and utilized in most obstetric and gynecology clinics in all the world\(^{(20)}\). The profile biophysical was utilized to estimate fetal well-being and to reveal gestational fetal age via measuring the diameter biparietal and crown rump length\(^{(21)}\). Other investigators need predicted intrauterine fetal weight utilize measurement ultrasonography of the fetal abdominal circumference\(^{(22)}\), most new studies have confirm the effectiveness of this measurement in normal monitoring growth fetal and in detecting growth intrauterine demise\(^{(23)}\).

### Patient and Method

A prospective cross sectional study that involve a record of neonatal deaths that occurred from birth till 28 days of life was applied at Alramadi teaching hospital for maternity and childhood. This hospital located at west of Iraq, average acceptance annual neonatal is 3654 neonates. The neonatology divided unit in to two sections; inborn and outborn units. The study in this hospital conducted because the is no annual reports for deaths neonatal at that hospital. Data were collected to attain and review data from January, 2019 to December, 2019. All newborns delivered and died within the initial 28 days following delivery from January, 2019 to December, 2019 were involved in our focus. Even referred neonates that were transferred from other health care centers to Alramadi Hospital were included. Newborns whose parents or caregivers refused the consent were excluded. All maternal and neonatal characteristics was registered and data sheet extraction. The questionnaire was designed via the researchers to write down the characteristics demographic of mothers and newborns.

- **Neonatal characteristics:** Gestational age (calculated from last menstrual period), birth weight, gender, presenting complaint findings on the examination physical (rate heart, rate respiratory, signs of distress respiratory, neurological examination, abnormal breath sounds, any congenital anomaly, cardiac murmurs, temperature, abdominal distension,) all were recorded.
- **Maternal characteristics:** age of the mother, educational level, residence and occupation.

Infections in the Neonatal was diagnosed established on the presence of clinical signs of contagion (coma, fever, unable to feed, jaundice, vomiting, hypotonia, distended belly, consciousness altered, seizure) and any of the other next criteria biological: Elevated white blood cell count >25,000/mm\(^3\), Dropping white blood cell count <5000/mm\(^3\), thrombocytes <100,000/mm\(^3\), C-reactive proteins >20 mg/l\(^{(24)}\) with documented positive blood culture of the causative microorganisms. Prematurity were acquaint established on WHO case qualifier of an age gestation less than 37 before weeks achieved\(^{(25)}\). (HIE) were established diagnosed on the Modified Sarnat-Sarnat Score\(^{(26)}\) and an Apgar score ≤ 3 at the 5th minute of life linked with central nervous system involvement signs: flaccidity, convulsions or coma\(^{(27)}\). PH analysis was not available at that time and so not included in diagnosis of HIE. The neonatal hospital death-rate rate ware acquaint as the number of deaths happening between admissible neonates through a known expressed time as a percentage\(^{(28)}\).

### Results

All results explaining in tables 1, 2, 3 and Figure 1, 2. The total number of NICU admission was 3654.
Table 1: Distribution of study patients by general characteristics of baby

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. (n= 3654)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (Days)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 3</td>
<td>2133</td>
<td>58.4</td>
</tr>
<tr>
<td>3 - 7</td>
<td>1051</td>
<td>28.8</td>
</tr>
<tr>
<td>&gt; 7</td>
<td>470</td>
<td>12.8</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1655</td>
<td>45.3</td>
</tr>
<tr>
<td>Female</td>
<td>1999</td>
<td>54.7</td>
</tr>
<tr>
<td><strong>Birthweight (gm)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1500</td>
<td>177</td>
<td>4.8</td>
</tr>
<tr>
<td>1500 - 2499</td>
<td>1109</td>
<td>30.4</td>
</tr>
<tr>
<td>2500 - 4000</td>
<td>2121</td>
<td>58.0</td>
</tr>
<tr>
<td>&gt; 4000</td>
<td>247</td>
<td>6.8</td>
</tr>
<tr>
<td><strong>GA at delivery</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term</td>
<td>1678</td>
<td>45.9</td>
</tr>
<tr>
<td>Preterm</td>
<td>1976</td>
<td>54.1</td>
</tr>
</tbody>
</table>

Figure 1: Incidence of neonatal death in NICU

Figure 2: Cause of neonatal death in NICU
Table 2: Association between NICU outcome and general characteristics of baby

<table>
<thead>
<tr>
<th>Variable</th>
<th>NICU Outcome</th>
<th>Total (%) n= 3654</th>
<th>P - Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Died (%) n= 336</td>
<td>Survived (%) n= 3318</td>
<td></td>
</tr>
<tr>
<td>Age at admission (Days)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 3</td>
<td>138 (6.5)</td>
<td>1995 (93.5)</td>
<td>2133 (58.4)</td>
</tr>
<tr>
<td>3 - 7</td>
<td>133 (12.7)</td>
<td>918 (87.3)</td>
<td>1051 (28.8)</td>
</tr>
<tr>
<td>&gt; 7</td>
<td>65 (13.8)</td>
<td>405 (86.2)</td>
<td>470 (12.8)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>209 (12.6)</td>
<td>1446 (87.4)</td>
<td>1655 (45.3)</td>
</tr>
<tr>
<td>Female</td>
<td>127 (6.4)</td>
<td>1872 (93.6)</td>
<td>1999 (54.7)</td>
</tr>
<tr>
<td>Birthweight (gm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1500</td>
<td>66 (37.3)</td>
<td>111 (62.7)</td>
<td>177 (4.8)</td>
</tr>
<tr>
<td>1500 - 2499</td>
<td>119 (10.7)</td>
<td>990 (89.3)</td>
<td>1109 (30.4)</td>
</tr>
<tr>
<td>2500 - 4000</td>
<td>145 (6.8)</td>
<td>1976 (93.2)</td>
<td>2121 (58.0)</td>
</tr>
<tr>
<td>&gt; 4000</td>
<td>6 (2.4)</td>
<td>241 (97.6)</td>
<td>247 (6.8)</td>
</tr>
<tr>
<td>GA at delivery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term</td>
<td>147 (8.8)</td>
<td>1531 (91.2)</td>
<td>1678 (45.9)</td>
</tr>
<tr>
<td>Preterm</td>
<td>189 (9.6)</td>
<td>1787 (90.4)</td>
<td>1976 (54.1)</td>
</tr>
</tbody>
</table>

Table 3: Logistic regression analysis for association of various risk factors with incidence of neonatal death in NICU

<table>
<thead>
<tr>
<th>Variables</th>
<th>Odd’s ratio</th>
<th>95% C.I for odd’s ratio</th>
<th>P - Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birthweight (gm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1500</td>
<td>3.7</td>
<td>2.18 – 6.07</td>
<td>0.008</td>
</tr>
<tr>
<td>Reference (2500 – 4000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate or primary school</td>
<td>2.56</td>
<td>1.06 – 4.29</td>
<td>0.024</td>
</tr>
<tr>
<td>Reference (Higher education)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place of delivery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home</td>
<td>2.15</td>
<td>1.18 – 6.45</td>
<td>0.001</td>
</tr>
<tr>
<td>Cause of admission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sepsis</td>
<td>6.82</td>
<td>2.81 – 10.11</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Discussion

This review which secured a number for 3654 babies, admitted to neonatal care unit at Alramadi teaching hospital for maternity and childhood.

The incidence of neonatal death in this study was 9.2% and this result disagree with Farah E. Abdifatah(29) who found a neonatal mortality rate of 5.7% in a study done in Ethiopia, our higher incidence of death may be related to the poor hospitalization care and declining facilities especially after immigration and ISIS invasion.

In our study we found that neonates weighting below 1500 gm was a significant risk factor for neonatal mortality p value was 0.008, odd’s ratio was 3.7 and this is similar to Lansky S, De Lima-Friche A, Silva A, et al and Juan C. Lona Reyes, M.D et al(30,31) who found that extreme low birth weight is a significant cause for neonatal death.
In the current study the neonatal mortality rate was significantly related to the maternal education (the illiterate mother or the mother who completed the primary school only) with a p value 0.024 odd’s ratio (2.56) and this is similar to Sandra Costa Fonseca(32) who found that the neonatal death-rate in the term was 8.09‰ and the higher in newborns of mothers with low levels of education.

Despite home deliveries were in small percentages in our study but the neonatal death were significant in home deliveries p value 0.001 odd’s ratio 2.15 and this is similar to Justice Ajaari, MSc (Med)1,2 et al.(33) and this reflected by Childbirth in institution health presented via a trained medical crew minimize maternal and neonatal death-rate and morbidity compared to births in the home.

Regarding the most common cause of admission to the NCU associated with higher mortality rate, in our study sepsis was the commonest cause of neonatal mortality p value 0.001 with odd’s ratio 6.82. This is not similar to M Hoque, S Haaq, R Islam who found that prematurity was the commonest cause of mortality in admitted neonates despite the higher percentage of admission due to sepsis.(34) This can be explained by low maternal education levels so they do not stick to the optimal sterilization ways in handling their newborns, so medical staff fails to contain the spread of infection. In addition to the old fashioned equipment and broken incubators which do not provide optimal environment to the newborns and lastly the total admission to neonatal care units exceeding its capacity due to large number of daily deliveries in that governorate, so overcrowded units is a major contributory for the spread of infection.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

Funding: Self-funding

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The Impact of Special Exercises (Football Flick Urban) in Developing the Skills of Passing and Suppression in the Football for Juniors

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Abstract

The difference games are characterized by accuracy, motor and skill compatibility, as well as diversity in offensive and defensive method and method of playing, due to the development that occurred in the science of sports training, which requires coaches to keep pace with this development and through the results of the teams it was found that the method used to develop football skills are ways It does not match this development taking place in this game, which prompted the researchers to prepare special exercises using a device in order to develop the skills of passing and Suppression football, as the experimental method was used in one group, while the research sample included the industry club’s number (20). As an intentional player and after completing the field experience, the two researchers concluded that the nature of special exercises on the device is consistent with the ability of the sample, which led to the development of the skills of passing and dousing football, as well as providing an element of pleasure and joy for the players during the training unit.

Keywords: Special exercises, Flick Urban and Suppression.

Introduction

The sports field has witnessed great progress in various sports, whether in the difference or individual games, as the progress in sports and events was not a coincidence, but rather perseverance and hard work through a deep understanding of what is included in the foundations and rules of the science of sports training to raise the level of The state of training to reach the highest levels, through research and permanent access to all that is new to add new information by following modern scientific method and method, devices and various tools to reach the athlete to an advanced level in performance and that among the games and events that have attracted the attention of workers in several areas despite their modernity It is football, which has received a large share of support and encouragement.

Football is one of the different games that attract the attention of peoples and governments to the privacy that it enjoys, which is to bring pleasure, joy and pleasure to the hearts of its fans, which made it the first popular game in the world, as we note the great development taking place in the technical, physical and planning aspects of players and teams and this did not come at random but rather The result of using scientific method and proper planning in training to achieve the best level, which represents the main goal of the training process in the sports field.\textsuperscript{(1)} The handling and extinguishing skills are among the important skills in the football game, especially after the great development in the different and modern method of playing in defence and attack

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and mastering my handling and extinguishing skills gives a preference to the team to excel in the matches over the competing teams, as the skills are the rule for the game although it does not perform the purpose. Without physical abilities and game plans, it remains the important element in the game and without her mastery, the team players cannot perform the duties and various play plans perfectly.

Hence the importance of research on how to develop soccer players according to the scientific foundations, by preparing exercises using a device that helps encourage players to continue training, excluding the factor of fear and failure and lack of flow of boredom and adding an element of suspense and excitement to training as well as helping to reduce effort and shortening Time, during which the coach can achieve the goals of the training unit and bring the players to a good level in mastering the skills.(2) Through the experience of the researchers in the football game, they noticed a weakness in the handling and suppression skills of the players, as well as the lack of use of devices and modern auxiliary means that help in developing these skills, since the effect of exercises in the equipment when training occurs desired developments to ensure the achievement of achieving the training goals and that through Many errors occur when performing and this may be due to the lack of use of exercises with modern equipment, which helps in developing these skills with a football.

Research objectives: Knowing the effect of the exercises related to using the device in developing the skills of handling and Suppression football for juniors.

Research hypotheses: Special exercises according to (Football Flick Urban) affect developing the skills of passing and Suppression football to the research sample.

Research methodology and field procedures

Research Methodology: It is the nature of the problem and the objectives of the research that determine the appropriate research approach. Therefore, a one-group experimental approach was used to suit the nature of the research problem.

The research sample: The research sample was chosen intentionally by the Sports Industry Club beginners, as the number of the sample population reached (20) players.

Means of gathering information and tools used in the research

Means of collecting information:
- Arab and foreign sources and references.
- Personal interviews.
- Testing and Measurement
- Data dump form.
- Devices and tools used in the research: (Football field, soccer balls, chalk, whistle (FOX), pens, training badges, tape measure).

Devices used in the research:

Football Flick Urban Device(3): It is a contemporary device with a stylish, three-dimensional and versatile design, used to develop the skills of football players, as it was designed to enable them to train individually, as it enables players to pass the ball to the height in the device and receive the ball again and at different heights and speeds and different angles to develop the handling and Suppression skills and their accuracy in controlling The ball as well as to kick the ball into the net in the device, as shown in Figure (1).

Football Flick Urban is used as an educational and training device to improve handling, Suppression, scoring and controlling ball skills, as well as providing fun and joy to players during training units in an attempt to create new skills and movements.
Figure 1. Shows the Football Flick Urban device

**Football Flick Urban:**

1. **Front slope:** It is the height located at the front of the device and consists of a convex arc. It has a smooth surface that can be adjusted to change the path and degree of difference of the return length (137 cm), width (74 cm) and height (72 cm).

2. **The back slope:** It consists of a curved corner backrest and a surface that returns to its condition Natural, which can reach (180 degrees) to change the flying ball, its length (110 cm), its width (74 cm) and height (72 cm).

3. **The network:** It is the last part of the device and is in the middle of it, which was designed to be used to pass the ball to the target, its length (48 cm), width (65 cm) and height (32 cm), as shown in Figure (2).

**Research tests:**

**Passing:**

- **Name of the test:** The ball passes about three overlapping circles drawn on the ground from a distance of (15 m).\(^{(4)}\)
- **The purpose of the test:** to measure the accuracy of the pass.
- **Tools:** (5 soccer balls), tape measure, football field, chalk, 1 person
- **Performance description:** Three concentric circles
with concentric dimensions draw their dimensions as follows: (the first circle has a diameter of 1.5 m) and the second diameter (3 m) and the third diameter (4.5 m), the starting line is determined (15 m) from the centre of the circles and the player stands behind the starting line and then He kicks the five balls in a row in the air, trying to drop them into the (smaller) circle.

- Conditions of performance: (The ball is kicked and passed in the air, not ground handling when the ball touches a joint line between two circles, the greater degree is calculated, the distance between one ball and another (50 cm)

- Recording method: (Each player has one attempt from (5) balls, the laboratory is counted (3) degrees if the ball falls in the first (the smallest) circle), the laboratory (two degrees) is counted if the ball falls in the second (middle) circle, the laboratory is calculated (a score (If the ball falls in the third circle (the largest), it is counted for the laboratory (zero) of degrees if the ball falls outside the three circles).

Control the ball:

**Test name: Ball control (suppression):**

- The purpose of the test: to measure accuracy in stopping the ball and regaining control of it alongside the foot, foot, thigh, or chest in a box (1.5 m).

- Instruments: (5 footballs), a defined area with two parallel lines, the distance between them (15m).

- Test specifications: The coach stands with the ball on line A and after giving the starting signal he throws the ball (high balls) for the player who advances from the starting line to the inside of the test are trying to stop the ball with any part of the body except the arms and then returns to the starting line Starting again and so the player repeats the five consecutive attempts.

- Conditions of performance: (If the coach misses the ball or throws it to the laboratory inappropriately, the attempt is repeated. The speed of the ball from the trainer is given to all the testers, then the correct attempt is not calculated in the following cases. “If the laboratory did not succeed in stopping the ball, if he passed any line in The area has more than one foot, if he illegally stops the ball, stands up at the football”

- Recording method: (Two grades are given in the case of putting the ball inside the box and not leaving the ball from it, one degree if the ball stands on any of the square lines and zero in the event of the ball leaving the square).

**Pilot study:** The exploratory experiment was conducted on Monday, 9/30/2019 at four o’clock in the Sports Club of Industry, on a sample of (6) players from the main research sample.

The scientific basis for the tests used: To get acquainted with the scientific bases of the tests used and after the researchers reviewed many sources from previous studies, it became clear that they were codified, as their sincerity and reliability were extracted in many studies, as well as using them on similar samples.

**Pre-test:** Pretests for the research sample were conducted on Tuesday (1/10/2019) and the soccer field and the conditions and method of testing and the assistant team were established to achieve the same conditions as possible when conducting the post-tests

Apply the main experience: The main experiment of the research sample was carried out on Thursday corresponding to (3/10/2019) and was completed on Saturday corresponding to (11/22/2019) on the members of the experimental group with two training units per week and the number of training units reached (14) units and took time Each training unit (75) minutes was divided into three sections:

1. Pre-section: 15 minutes.
2. The main section: 50 minutes.
3. The closing section: 10 minutes.

**Post-test:** The researchers intentionally conducted the post-exams after completing the training curriculum and its (14) training units on Monday corresponding (11/25/2019), taking into account all the conditions, conditions and procedures for the pretests.

Statistical means: The researchers used the appropriate statistical means to process the resulting data through pre- and post-tests via the (SPSS) system.

**Results and Discussions**

Present and discuss the results of the football handling and dousing skills in the pre and posttests.
Table 1. Shows the values of the mean, the standard deviations, the deviations of the differences from its mean, the calculated and tabulated \((t)\) value and the significance of the differences between the pre and posttests of the research sample in handling and suppression skills

<table>
<thead>
<tr>
<th>Basic skills</th>
<th>Units</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>((t)) Calculated</th>
<th>((t)) Tabulated</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passing</td>
<td>Degree</td>
<td>5.14</td>
<td>0.73</td>
<td>8.66</td>
<td>1.41</td>
<td>4.50</td>
<td>1.81</td>
<td>8.43</td>
</tr>
<tr>
<td>Suppression</td>
<td>Degree</td>
<td>4.65</td>
<td>0.74</td>
<td>7.33</td>
<td>0.73</td>
<td>3.80</td>
<td>1.98</td>
<td>6.12</td>
</tr>
</tbody>
</table>

\((t)\) tabulated (2.09) at the level of significance (0.05) and degree of freedom (19).

Table (1) shows the values of the mean for the pre-test of the research sample in the passing and suppression skills in the pre and posttests, as it was found that the calculated value of \((t)\) for each component under investigation, respectively. (2.09) This means that there are significant statistically significant differences between pre and posttest.

The researchers attribute the reasons for these differences to the following:

- The effect of using devices and tools to develop accuracy through the performance and repetition of special exercises in a manner that lives up to being close to the playing conditions while taking into account the change in the exercise and its multiplicity as well as the player’s rush towards the skilful performance of modern and easy to use devices that were not previously used as a Football Flick Urban device raises motivation. The player in the experience of what is new makes him perform the repetitions with confidence and desire and work towards the best and “that the player reaches the performance of the skill automatically through the permanent repetition of the performance.”

- The researchers attribute this development to the research sample to the effectiveness of skill exercises through the use of a device to develop the skills of passing and Suppression football, as the devices work to develop the capabilities of players, whether physical, motor or skill, as it expands their sensory, motor and cognitive awareness and increases the focus of their attention, “The equipment and the auxiliary tools have a distinct role in the sports field in general and in football in particular.”

- The optimal use and significant impact of the use of multipurpose teaching aids (Football Flick Urban), as these educational method added factors of influence in the player in terms of spreading the spirit of competition and fun and get rid of the boredom and monotony that exist in the traditional uses free of educational means, and “Proficiency in the use and use of teaching aids contribute to improving the processes of education and training, which leads to its contribution to teaching motor skills and mastering them to the fullest extent. The use of assistive devices and tools contributes to increasing motivation, desire and excitement in training units and increases.From the player’s ability to exercise.”

- “(9) “the necessity of using the auxiliary tools during the training process and investing all that is available from it, also stressed the need for diversification in the exercises and the tools used to keep players out of boredom and increase the suspense process.”

**Conclusion**

1. The use of skill exercises and equipment within the training curriculum in the special preparation stage has a positive and effective impact in developing ball control skills.

2. Increasing the accuracy and concentration factor of some players led to a good stage in the ball control skills.

3. The various exercises and using the devices increase the factor of excitement, suspense and competition, which led to the ease of the process of developing ball control skills among players.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding
References


The Effect of Playing Exercises According to the Training Network on the Speed of the Motor Response and the Level of Skillful Performance of Youth Soccer Players

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Abstract

The world is now witnessing a rapid development in all areas of life and the sports field, one of which has received a share of this progress and clear development and the importance of research lies in preparing play exercises that are performed according to the training network and that contribute to developing the speed of the motor response to football players, which in turn contributes to the development of The skill level of young players and the study objectives to identify the effect of these exercises on the study variables.

After testing and collecting information, the results were extracted and the most important conclusions were reached:

1. The results of the post test showed that there are statistically significant differences in the research variables.

2. The exercise exercises according to the training network have a positive effect in developing the speed of the motor response and the skill level of the research sample.

Keywords: Playing exercises, training, network and motor response.

Introduction

The world is now witnessing a rapid development in all areas of life and the sports field, one of these areas, which received a share of this progress and clear development and the outputs of the training process are evidence of the progress of the levels of players in various sporting events and football is the first popular game in the world because of its millions of practitioners Followers and fans who witnessed remarkable progress and development at the global level, which is the result of an effort by experts and specialists in the process of researching and investigating facts and knowledge and all that is new to develop and raise the level of players in this event and sees that “the greater the individual’s mastery of motor skill, The less effort exerted in performance and the more he is able to use all his thinking and attention to the various planning duties in the course of competition.”

Sports training science is one of the most important education and sports because it is closely related to all other sports sciences such as physiology, motor learning and sports rehabilitation in addition to psychology and sports training is based on modern and advanced scientific foundations when preparing exercises and training units, including the degree of intensity, size and periods of rest that are codified according to The method of training and the training phase and its appropriateness to the level of the research sample and that the codified training curriculum that is applied in an organized scientific and practical manner will produce rapid developments in
the physical, mental and skill status of athletes, which leads to achieving the goals of the training process and that the process of assessing and evaluating the success of the prepared training curriculum is measured by the extent of The development achieved by players as individuals in the activity practiced and reflected at the level of the general team and confirms that “movement develops with regular athletic training as a result of the development of the mental and intellectual level and the development of physical and motor qualities in addition to increasing what is stored in the brain from movement experiences.”

The importance of the research lies in preparing play exercises that are performed in specific areas (the training network) that contribute to developing the speed of the motor response to football players, which in turn is reflected in developing the level of skill performance of young players and this means The training of skills and plans is through close exercises What happens in the game.

Through the researchers’ pursuit of being athletic players and teachers and informing them of all the developments taking place in the field of the game, they found that there is a decline in the levels of players for skill performance and speed of motor response, which requires researchers to prepare exercises close to the atmosphere of real competition performed in specific areas (play exercises) That contributes to solving the search problem.

Research objectives:
1. Preparing exercises for playing in specific areas (the training network).
2. Knowing the effect of playing exercises according to the training network on game variables.

Hypothesis search:
1. There is a statistically significant difference by the effect of playing exercises on search variables.
2. There are statistically significant differences between the pre and posttests in the motor response speed and the skill level of the research sample.

Research fields:
- Human Field: Youth of Ramadi Football Club.
- My field: In the Ramadi Football Club.

Research methodology and procedures:

Research Methodology: Researchers have adopted the appropriate experimental approach imposed by the nature of the problem to be studied.

Community and research sample: The research population and sample were identified from the 16 Ramadi youth football players for the football season (2019-2020) and they were chosen in an intentional manner.

Research devices and tools and means of gathering information:
- Electronic hours (3) of Korean origin.
- Sony type camera (3) of Japanese origin.
- Chinese (TAKSUN) type electronic calculator.
- Legal football playing field.
- Legal soccer balls, number (18).
- Figures number (12).
- Sports shirt number (20).
- Whistle (2).
- Tape measure.
- Arab and foreign sources.
- Tests and measurements.
- Internet.
- Observation and analysis.

The tests used

Determine the football skill test:
- Test name: Football Soccer Skill Test
- Test goal: to measure soccer skill
- The necessary tools: half of the football field, an electronic stopwatch, a whistle, (4) obstacles, (6) characters, (3) flags, a tape measure, one football and one bench.
- Test description: The player starts running from the specified starting point at the corner of the penalty area that is located with the goal line, as there is a ball (10 m) from the starting point and he has to roll the ball between four contra indications to the distance between each couple (longitudinally 4 m and the width of 2 m) and then complete the rolling with the ball Until the midfield line, to meet an
upright pass from both sides and a distance of (5 m) from this upright there are four people at different distances which are respectively (1.5-1-2-1 AD) and then after the pass from the side of the last post go to the goal And after (10 m) there is a post to pass from its side and pass the ball to the Swedish tilted seat with the running line to return to the ball and kick it towards the goal.

- Recording: time is counted from the starting moment to the scoring moment and (1/10) of the second is added in the event that the player collides with one of the signs and rests on the ground.

The Nelson Test for Selective Kinetic Response⁶:

The purpose of the test: To quickly measure the ability to respond and move according to the stimulus test.

The necessary tools:

- Tennis court: a flat, barrier-free zone with a length of 20 m and a width of 2 m within which three lines plan the distance between the line and the other (6.40 m) and the length of the line in the middle (1 m).
- Electronic stopwatch, tape measure.
- Administratively testing
  - Registered/calls on names first and records test performance second.
  - Timer/Start indication with timing.
- Performance specifications: The player stands at one of the ends of the midline in the face of the timer, which stands at the end of the other end of the line and the player takes the standby position so that the midline is between the feet and then he bends his body forward slightly and the timer grabs the stopwatch with one hand and raises it to the top and then quickly moves his arm to the left or the right and at the same time the clock is running and when the player responds to the start signal he tries to run as fast as possible in the specified direction to reach the side line that is away from the middle direction a distance (6.40 m) and when the player crosses the right side line the timer stops the clock.

Test instructions:

- If the player starts in the wrong direction, the timer continues to run the clock until the player changes his direction and reaches the correct side line.
- The player is given (6) consecutive attempts between each attempt and the other (20) seconds of rest and (3) attempts on each side.
- Attempts are chosen on each side in a random and sequential manner.
- The timer must practice the starting signal in order to be able to give this signal to the arm and operate the watch at the same time.
- The player must not know the number of attempts required of him to perform it in order to reduce the player’s expectation.
- The test should start with the timer showing a signal (get ready - start) in all attempts.
- Recording method: the time for each attempt is calculated to the nearest 1/100 second.
- The test score is the average of the six attempts (total score = total attempts ÷ 6 = 0.00 Second).

Results

Table 1. Show the mean, the standard deviation, the calculated value (t) and the significance of the differences between the pre and post test results in the kinematic response speed of the research group under study are shown

<table>
<thead>
<tr>
<th>Variables</th>
<th>Units</th>
<th>Pretest Mean</th>
<th>Pretest SD</th>
<th>Posttest Mean</th>
<th>Posttest SD</th>
<th>Mean diff.</th>
<th>SD diff.</th>
<th>(t) value</th>
<th>Indication of differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kinetic response speed</td>
<td>Sec.</td>
<td>1.850</td>
<td>0.206</td>
<td>1.783</td>
<td>0.206</td>
<td>0.063</td>
<td>0.044</td>
<td>5.727</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

* Table (t) value = (2.131) in front of the degree of freedom (16-1 = 15).

Table 2. Shows the values of the mean, the standard deviation, the calculated (t) and the significance of the differences between the results of the pre and posttest in the skill performance of the research group under study.
<table>
<thead>
<tr>
<th>Variables</th>
<th>Units</th>
<th>Pretest</th>
<th></th>
<th>Posttest</th>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Mean</th>
<th>SD</th>
<th>(t) value</th>
<th>Indication of differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>Sec.</td>
<td>38.937</td>
<td>2.999</td>
<td>37</td>
<td>2.780</td>
<td>1.75</td>
<td>1.653</td>
<td>4.237</td>
<td>2.131</td>
<td>Sig.</td>
<td></td>
</tr>
</tbody>
</table>

* Table (t) value = (2.131) in front of the degree of freedom (16-1 = 15).

**Discussions**

This is what shows the extent of the effect of playing exercises according to the training network, which was applied in the training curriculum for young players to develop the speed of the motor response and skill performance in the football game, because the exercises contain the principle of excitement and suspense, which was characterized by the progression from easy to difficult and sound scientific planning, as he mentioned Training in football is characterized by planning, organization and continuity and on scientific grounds to ensure the duration of positive influence on the player’s level and its continuity as an introduction to various aspects of football as the principle of gradual increase in the level of pregnancy and the correct timing of its repetition.6

The researchers believe that the development that occurred in the research variables is due to the influence of the independent variable (exercises by playing according to the training network) and the user according to correct and studied scientific foundations that were close to their performance in the real competition atmosphere, which contributed to the development of players’ performance in the best way, in addition to the method and method of training The follower led to its positive reflection in the development of the speed of the kinetic response and its effect on the progression of the skill level of the players.7

The researchers attribute the reasons for the development of the level of skill performance and the speed of the kinetic response in the results of the post-tests to the effect of playing exercises applied in the two method of high-intensity and repeated training using the training network as well as the use of the correct repetitions of the chosen variables and correcting errors and treating them in a scientific, practical and educational manner correct and studied with giving an opportunity for players to perform The largest possible number of iterations and directing them to reach the perfect performance,8 which contributed to bringing them to a better level. And this is confirmed that developing the level of technical performance of the players by providing an opportunity to increase the number of iterations as well as giving feedback to address errors during performance and teaching motor skills leads to correct player responses and directing his motor behavior towards the correct form that It raises the level of accuracy of skill education performance,9 and this is consistent with the advantages of exercises in the designated areas help increase the speed of movement and the transition speed from one place to another without the emergence of fatigue quickly as well as developing the agility and lightness necessary to develop performance in Different skills.10

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding

**Conclusions**

1. The results of the post test showed that there are statistically significant differences in the research variables.
2. The exercise exercises according to the training network have a positive effect in developing the speed of the motor response and the skill level of the research sample.

**References**

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The Effect of the Comparative Marital Competition Method on Developing the Most Important Motor Abilities and Learning the Technical Performance of the Students’ Effective Shot Putting

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Abstract

The method used in teaching the scheduled study materials do not seek to activate the role of the student in the academic stages and give her a positive character in addressing and facing educational problems that she encounters in her working life - including the effectiveness of pushing the weight, as the progress in the educational process requires the teacher to choose the best method to develop the effectiveness What is required is that teaching method have a major role in developing the skill level of learners. The more developed the teaching method used, the better the learning process and the greater the opportunity to advance the skill performance.

As for the objectives of the research, they are to identify the effect of the marital comparison method in developing the most important motor abilities and learning the technical performance of the effectiveness of pushing the weight of the students, as well as identifying the significance of the differences between the two research groups (control and experimental) in the results of the post tests in developing the most important motor abilities and learning the technical performance of the effectiveness of push Shot putting for female students. As for the research hypotheses, there are significant differences with statistical significance between the results of the pre and posttests in developing the most important abilities Kinetics and learning the technical performance of the students 'effective push.

Keywords: Comparative marital, motor abilities, health practice; and shot putting.

Introduction

The educational process is based on an important means, which is to transfer knowledge and information from the teacher to the learner in the appropriate way. An efficient teacher is the one who can diversify in the use of different method and method and provide all that is new in his field to raise the state of boredom and boredom that accompanies the learner during learning resulting from the use of one method, which may lead to the desired development, since we learned that the learner is greatly affected by the method and method that Followed by the teacher and the list on the basis of experimentation and application, so the researchers decided to use a better educational method in order to facilitate the process of learning faster and better than the educational method, which is (the method of comparative marital competition).

The field and field activities are among the activities
that have a distinguished position among other types of sports, as they include a variety of activities such as: running, jumping, jumping, throwing and mail and walking. And it is called the mother of games because it is the foundation upon which the rest of the games are built, as it develops physical characteristics, including strength, speed, elongation, agility, flexibility and others.\(^{(1)}\)

The method used in teaching the scheduled study materials do not seek to activate the role of the student in the academic stages and give her a positive character in addressing and facing educational problems that she encounters in her working life - including the effectiveness of pushing the weight,\(^{(2)}\) as the progress in the educational process requires the teacher to choose the best method to develop the effectiveness What is required is that teaching method have a major role in developing the skill level of learners. The more developed the teaching method used, the better the learning process and the greater the opportunity to advance the skill performance.\(^{(3)}\)

**Research objectives:**

1. Knowing the effect of the marital comparison method on developing the most important motor abilities and learning the technical performance of the students’ effective pushing weight.

2. Identify the significance of the differences between the two control and experimental research groups in the results of posttests in developing the most important motor abilities and learn the technical performance of the effectiveness of shot putting for students.

**Research Methodology**

The researchers used the experimental approach to fit the nature of the problem to be solved by designing the two equivalent groups with pre and post testing.

**Research community and sample:** The research community determined the third stage students in the College of Physical Education and Sports Science/University of Karbala for the academic year 2017-2018, whose number is (65) students and the sample was randomly chosen, whose number is (30) students and was divided into two groups (control - experimental) and the number of each group (15) female students and (10) female students were excluded due to their selection for the purpose of conducting the exploratory experiment.

**Research steps and field procedures:**

**Determine the most important motor abilities:**

The most important motor abilities were identified that are appropriate to the students’ weight-bearing efficacy through the researchers’ review of the sources and references and after that a questionnaire was prepared and presented to experts and specialists and the most important motor abilities that got a percentage of (70%) and above and table No. (1) were identified, this is indicated.

<table>
<thead>
<tr>
<th>S</th>
<th>Motor abilities</th>
<th>Relative importance</th>
<th>Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Compatibility</td>
<td>72%</td>
<td>*</td>
</tr>
<tr>
<td>2</td>
<td>Precision</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Balance</td>
<td>57%</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Kinetic response speed</td>
<td>54%</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Streamline</td>
<td>55%</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Motor expectation</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>reaction</td>
<td>55%</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Motor transport</td>
<td>36%</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Agility</td>
<td>73%</td>
<td>*</td>
</tr>
<tr>
<td>10</td>
<td>Mobility</td>
<td>48%</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Flexibility</td>
<td>71%</td>
<td>*</td>
</tr>
</tbody>
</table>

Table 1. Shows the most important special kinetic abilities, their relative importance and their suitability
Determining tests for kinetic abilities:

Table 2. Show the questionnaire to determine the most appropriate tests

<table>
<thead>
<tr>
<th>S</th>
<th>Abilities</th>
<th>Name Test</th>
<th>N. of agree</th>
<th>N. of disagree</th>
<th>(Chi square) Value</th>
<th>The choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agility</td>
<td>Running like zakk</td>
<td>10</td>
<td>2</td>
<td>5.32</td>
<td>√</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shuttle running</td>
<td>2</td>
<td>10</td>
<td>5.32</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Flexibility</td>
<td>Spine flexibility</td>
<td>11</td>
<td>1</td>
<td>8.32</td>
<td>√</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hip joint flexibility</td>
<td>–</td>
<td>12</td>
<td>12.52</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Compatibility between (eye and arm)</td>
<td>Throw and receive balls</td>
<td>10</td>
<td>2</td>
<td>5.32</td>
<td>√</td>
</tr>
<tr>
<td>4</td>
<td>Compatibility between (Eye –leg)</td>
<td>On the wall</td>
<td>10</td>
<td>2</td>
<td>5.32</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Numbered circuit test</td>
<td>2</td>
<td>10</td>
<td>5.32</td>
<td></td>
</tr>
</tbody>
</table>

Determine the technical performance test for shot putting effectiveness:

**Shot putting test:** Purpose of the test: Evaluating technical performance by pushing the weight.

**Tools:** The throwing circle, which is a circle with a diameter of (2.135 meters) covered with cement in the center of the circle, there is a line that divides it into two parts and at the front of the circle there is the throwing part and fixed to the ground and is called the stop plate.

**Characterization of kinetic abilities tests**

**First: Fitness test**

The name of the test = running like a dream

The purpose of the test = (Measuring Fitness)

The tools used = (person count (4) stop hours, number (1) evaluation form)

**Second: flexibility test:**

The goal of the test: To measure the elasticity of the torso and thigh in the forward bending motions in pushing the stand.

**Tools:**

1. A scale of wood or a ruler with a length of about 20 cm divided by lines into units, each unit equal (1) cm and it is preferable that this gradient occur in a range of 10 cm.
2. A bench, chair, or table that bears the weight of the laboratory without vibration

**Third: The kinetic compatibility test between the eye and arm**

Test name: throw and receive balls on jars

The purpose of the test: to measure compatibility between the eye and the arm

The tools used: a tennis ball (1) a wall drawing a line a distance of (5) meters from the wall/evaluation form.

Method of registration: For each valid attempt, one score for the tested student is calculated and the final score is 15 degrees.

**Kinetic test between the eye-the leg**

**Test name: Numbered Circuit Test**

The purpose of the test: to measure compatibility between the eye and the leg

The tools used: stop watch number (1) draw on the ground (8) circles provided that the diameter of each of them is 60 cm and numbered from (1-8) evaluation form.

Recording method: The time spent by the student tested in the transition to the eight circles.

**The main experience:**

**Pre tests:** Pretests for the research sample were conducted on Thursday, 2/12/2017, after the implementation of two educational units within the program.
The educational units for the method of comparative conjugal competition:

- The total number of units is 8 units.
- Number of units per week (one educational unit).
- The time of the educational unit is (90) minutes.
- Time of the applied section in the main section (45 minutes)
- Exercises were used in the competitive comparison method and applied to the experimental group, as they included exercises to develop the most important abilities and test the technical performance of the effectiveness of pushing the weight of the students and to make sure that these exercises achieve the desired goal, although they came in the sources were presented to a group of experts and practitioners in this field.
- The exercises were carried out by the school of material and with the assistance of the assistant team.
- The control group is subject to the vocabulary of the educational program followed.

Post-test: The researchers conducted the post tests for the individuals of the research sample and for the control and experimental groups on Thursday, 4/2/2017. In that he followed the method he used in the pretests themselves, taking into account the same spatial, temporal and climatic conditions, the means of the tests and his tools.

Results and Discussions

Table 3. Shows the results of the most important motor abilities between the pre and posttests of the control group and its analysis

<table>
<thead>
<tr>
<th>S</th>
<th>Variables</th>
<th>Units</th>
<th>Pretest</th>
<th>Posttest</th>
<th>(t) calculated*</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>1</td>
<td>Agility</td>
<td>Repeat</td>
<td>12.5</td>
<td>0.31</td>
<td>13.16</td>
<td>1.37</td>
</tr>
<tr>
<td>2</td>
<td>Flexibility</td>
<td>Cm</td>
<td>.349</td>
<td>1.36</td>
<td>12.05</td>
<td>1.32</td>
</tr>
<tr>
<td>3</td>
<td>Compatibility between (eye and arm)</td>
<td>Repeat</td>
<td>4.16</td>
<td>1.16</td>
<td>8.66</td>
<td>2.85</td>
</tr>
<tr>
<td>4</td>
<td>Compatibility between (Eye–leg)</td>
<td>Second</td>
<td>0.16</td>
<td>0.20</td>
<td>0.20</td>
<td>0.19</td>
</tr>
</tbody>
</table>

*Table (t) value (2.14) at freedom (14) and under significance level (0.05)

Table 4. Show the mean and standard deviations show the value of (t) calculated between the pre and posttest bin for the most important kinetic abilities of the experimental group

<table>
<thead>
<tr>
<th>S</th>
<th>Variables</th>
<th>Units</th>
<th>Pretest</th>
<th>Posttest</th>
<th>(t) calculated*</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>1</td>
<td>Agility</td>
<td>Repeat</td>
<td>12.75</td>
<td>0.27</td>
<td>15.16</td>
<td>0.68</td>
</tr>
<tr>
<td>2</td>
<td>Flexibility</td>
<td>Cm</td>
<td>12.83</td>
<td>1.36</td>
<td>20.33</td>
<td>0.75</td>
</tr>
<tr>
<td>3</td>
<td>Compatibility between (eye and arm)</td>
<td>Repeat</td>
<td>5.5</td>
<td>1.37</td>
<td>8.83</td>
<td>1.21</td>
</tr>
<tr>
<td>4</td>
<td>Compatibility between (Eye–leg)</td>
<td>Second</td>
<td>0.17</td>
<td>0.018</td>
<td>0.76</td>
<td>0.12</td>
</tr>
</tbody>
</table>

*Table (t) value (2.14) at freedom (14) below the significance level (0.05).
Table 5. Show the mean, the standard deviations, the calculated value (t) and the posttests concern the kinetic abilities between the experimental and control groups

<table>
<thead>
<tr>
<th>S</th>
<th>Variables</th>
<th>Units</th>
<th>Experimental group</th>
<th>Control group</th>
<th>(t) calculated*</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>1</td>
<td>Agility Repeat</td>
<td>Repeat</td>
<td>15.16</td>
<td>0.68</td>
<td>13.16</td>
<td>1.47</td>
</tr>
<tr>
<td>2</td>
<td>Flexibility Cm</td>
<td>Cm</td>
<td>20.33</td>
<td>0.75</td>
<td>12.05</td>
<td>1.32</td>
</tr>
<tr>
<td>3</td>
<td>Compatibility between (eye and arm) Repeat</td>
<td>Repeat</td>
<td>8.83</td>
<td>1.21</td>
<td>8.66</td>
<td>2.85</td>
</tr>
<tr>
<td>4</td>
<td>Compatibility between (Eye–leg) Second</td>
<td>Second</td>
<td>0.76</td>
<td>0.12</td>
<td>0.20</td>
<td>0.19</td>
</tr>
</tbody>
</table>

*Table (t) value of (2.04) at (28) degrees of freedom and below the significance level (0.05).

The researchers believe that the implementation of the educational units prescribed for the group had an impact tangible to the members of this group, as the prepared method that led to the development of these kinetic abilities they have through their repetition and practice as practice and constant effort and repetitions are necessary in the learning and repetition process is an important and necessary factor in the process of the learner’s interaction with skill and control of his movements and checking the consistency between movements. The component of skill in continuous performance, appropriate time and continuous repetition alone from the learner’s skill development, development and mastery.\(^{5}\)

In addition, the presence of the educated in the presence of competition with the difference in performance led to the occurrence of these differences in addition to their regularity in the educational units in which they practiced a method a new one was not familiar to them,\(^{6}\) which strengthened their motivation to implement the exercises of kinetic abilities with all persistence and success and this was confirmed (in that the effort exerted on competition in order to excel is a factor considered to be at the heart of the human nature) in addition to the exercises on the kinetic abilities that worked in the course of the departments of the educational unit and by relying on the method of comparative competition,\(^{7}\) it is also an important role in the emergence of these conditions - through jogging, running and jerking exercises. Soft, arms and gaming exercises, as well as the flexibility of the muscles of the body.\(^{8}\)

The results of the technical performance test for the effectiveness of pushing the weight of the members of the research sample, where the results showed the presence of a statistically significant difference with a probability of error (0.05) and in favor of the post-test of the control group and the researchers attribute this development to the educational program followed by the lessons of the arena and field games (For weightlifting efficacy) which significantly affected the development of test results for the control group. As for the experimental group, there was a significant moral difference in favor of the post-test. The researchers attribute this difference to the effect of the conjugate comparison method applied to the experimental group, as the primary goal of all exercises is to develop the player’s ability and increase his ability to reach to a good level of performance that qualifies this level of resilience to other skills and other abilities.\(^{9}\)

Conclusions

1. The comparative, marital, competitive method has a significant and effective influence in developing the most important motor abilities and learning the technical performance of the effectiveness of shot putting.

2. The experimental group outperforms the control group in developing the most important motor abilities and learns the technical performance of shot putting effectiveness.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

Funding: Self-funding

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Calcium Administration to Improve Parturition in Dairy Cows

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Abstract

Parturition in bovine consider as a stressful event to the calving cows and calves as well. In general divided into three phases. The former involves the endocrinal and mechanical arrangement of uterine and cervical tissues, embryo and birth the newborn and expulsion of the placenta. Calcium is one of the essential materials in the body which was found that subclinical hypo-calcemia can highly affect cows and about 47% of the multiparous with 25% of the heifers were affected. Forty animals were selected and divided into two equal groups, first group treated with intramuscular administrations of calcium, the remained group were injected Intramuscular normal saline. The result showed there are significant decrease in the time of parturition in group administered with calcium as compared with non-treated group.

Aim of Study: Evaluate the role of calcium on time of parturition period and some trouble shot during it.

Keywords: Calcium, Parturition, Cow; nutrition.

Introduction

Parturition in bovine is a stressful event to the calving cows and calves as well[¹]. This mechanism can alter the energy profile of offspring and dams, producing a metabolic imbalance at birth. The dilation of pelvic canal, the contractions of abdominal and uterine muscles and pain related with fetal expulsion are strongly implicated in a complex pattern of neuroendocrine regulation[²]. Parturition is generally partitioned into three phases. The former involves the endocrinal and mechanical arrangement of uterine and cervical tissues for parturition. The second stage includes bring out of the embryo and birth the newborn. The later stage includes expulsion of the placenta[³].

It was found that subclinical hypo-calcemia can highly affect cows and about 47% of the multiparous with 25% of the heifers were affected[⁴]. The subclinical hypo-calcemia elevates of non-esterified fatty acids in the plasma and destroys the immune system[⁵]. Moreover, hypo-calcemia leads to reduce reproductive performance, increase the risk of culling[⁶], female genital tract diseases and lactation production[⁷]. Therefore, calcium is the most critical electrolyte managing myometrium constrictions. The myometrium contains an intracellular pool of bound calcium put away in the sarcoplasmatic reticulum and the myometrium cells have high convergence of sarcoplasmaticreticulum[⁸]. Calcium can be mobilized from the sarcoplasmatic reticulum just as from the extracellular liquid. The insufficiency of calcium may incline the cows to dystocia[⁹] and reduce of uterine contractions resulting to the disappointment of fetal expulsion yet the immediate role of calcium in detachment of fetal membranes isn’t comprehended. Troublesome birth is a main source of calf demise at or soon after birth and prompts uterine contaminations and increasingly retained placentas[¹⁰]. Accordingly, this
research was designed to evaluate the role of calcium on time of parturition period and some trouble shot during it.

**Materials and Method**

**Animals:** The current study was approved by the Institutional Animal Care and Use Committee, University of Kufa, Iraq. A single dairy farm was conducted to do the present study. The herd consisted of 80 cows. The cows had body condition score between 3.5 and 4.5. Cows without history of retained fetal membranes (n = 40) were randomly selected and divided into two groups. All animals were healthy at the time of the study and the herd was kept under sanitary conditions throughout the study.

Cow and treatment local dairy cow utilized in the investigation were kept at a commercial farm under normal homestead conditions. Cows without history of retained fetal membranes (n = 20) were randomly divided into two equal groups. First ten cows were intramuscular administrations of calcium (20 mg/mL) mg.kg-1, the remained ten were injected Intramuscular normal saline (10 ml)and the following parameters were examined and evaluated: Time of parturition period, nature of parturition and the occurrence of retained placenta.

**Statistical analysis:** Statistical analysis of data was performed on the basis of Chi-Square Analysis using a significant level of (P<0.05). Specific group differences were determined using.

**Results**

The time of parturition period in cow treated and non-treated with calcium/hour illustrated in figure (1), the result show significant decrease (P<0.05) in the time of parturition in group treated with calcium as compared with non-treated group. While the nature of parturition normal and abnormal (birth with a veterinary intervention) and the occurrence of retained placenta clarified in figures (1 and 2) respectively, the results show no significant changes (P<0.05) between treated and non-treated with calcium.

*significant difference P<0.05 between two groups due to the value of Pearson Chi-Square (Asymptotic Significance) equal to 0.001 is less than (0.05).

*Figure (1):The time of parturition period in cow treated and non-treated with calcium/hour (h).*
*Non-significant difference P<0.05 between two groups due to the value of Pearson Chi-Square (Asymptotic Significance) equal to 0.361 is more than 0.05.

**Figure (2): Nature of parturition in cow treated and non-treated with calcium**

*Non significant difference P<0.05 between two groups due to the value of Pearson Chi-Square (Asymptotic Significance) equal to 0.361 is more than 0.05.

**Figure (3): The occurrence of retained placenta in cow treated and non-treated with calcium**
Discussion

The objective of the present study was to study the effect of calcium supplementation to pregnant cows to minimize the risk of dystocia in cows of low or high risk of retained fetal membranes.

Calcium concentrations in the circulatory system are kept up by the eating routine and calcium discharged from the skeleton. The disappointment of calcium absorption from the eating routine and skeleton result in an abrupt deduction in blood calcium concentrations. At the point when the mammary drain of plasma calcium causes hypocalcaemia extreme enough to disrupt neuromuscular function\[11\]. Due to the start of colostrum production and consequently increasing calcium demand, the nadir of serum calcium concentration occurs 12 to 24 h after parturition\[11-12\].

The results give an indication that calcium is not needed to initiate the labour while that showed decreased in time of parturition compared with non-treated group, that was agreed with\[14\], which showed the calcium oral administration of calcium is improved parturition as well as Zhang et al (2020)\[15\] showed the which Ca status is associated with energy metabolism of transition dairy cows.

The time of parturition related to the energy therefore to Cabalance which is associated with energy metabolism of transition dairy cows. In generally cows in the transition stage of parturition are susceptible to risk of negative energy balance due to lack of synchronization between appetite recovery and milk secretion while milk production related to energy balance \[16-15\]. On other hand study results showed the increased significantly in time of parturition in non-treated group compared with the treated groups.

Administration of Calcium was not affected on nature of parturition which result of study showed non-significant different between treated and non-treated group with calcium as agreed with find on similar studies\[16-17\] when used oral administration of calcium. As well as the causes of retained placenta is usually by an inflammatory state as showed by present studies\[18\] or by late gestation and labor.\[19\]

The occurrence of retained placenta did not affected which the study found that are non-significant different between treated and non-treated groups in the same time we agreed present studies \[15\] which showed calcium did not effect on the nature of parturition.

Conclusion

The administration of calcium improved parturition which decreased the period of parturition time, while that did not effect on nature of parturition and retained placenta.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: Non

Funding: Self-funding

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Strong Evidence of Highly Pathogenic and Low Pathogenic Avian Influenza Viruses in Domestic Poultry in Iraq

Karar Mohammed Abdul-Sada

Abstract

Background: Avian influenza is very important contagious disease caused by Avian Influenza A viruses which continue to pose real threats for both human and animal. The virus subdivided into many HA and NA subtypes, some of them are highly pathogenic while others are low pathogenic for poultry.

Method: Nasal swabs or fresh tracheal swabs in case of dead birds were taken from 417 of chicken farms and flocks besides to 689 of local poultry that grew in the backyards all over Iraq to detect and identify viral subtypes.

Results: Avian influenza viruses were observed in 7.04% of commercial chicken farms and in 4.93% of local poultry that growing in the backyards at Iraq; following subtypes were recorded: H9N2, H5N1, H7N9, H5N8 and H5N2. Subtype H9N2 is the prevalent type, all infections with H5N1, H5N8 and 28.57% of H7N9 subtypes were highly pathogenic; 100% of infections with H9N2, H5N2 and 71.42% of H7N9 appeared as low pathogenic.

Conclusions: According to the author’s knowledge, the present study is first study recorded avian Influenza virus subtypes: H5N1, H7N9, H5N8 and H5N2 in domestic birds at Iraq.

Keywords: Avian Influenza Virus; Low pathogenic AIVs; Highly pathogenic AIVs.

Introduction

Avian influenza viruses (AIVs) are type A influenza viruses which considered as omnipresent pathogen that continue to pose a cosmopolitan and real threat for animal and human health, they belong to Orthomyxoviridae family; characterized by enveloped virion with single-stranded, eight segmented negative polarity RNA genome. According to their surface glycoproteins, it classified into 18 HA and 11 NA subtypes, of which about 16 HA (H1–H16) and also 9 NA (N1–N9) subtypes that circulate in birds[1,2].

Avian influenza H5 and H7 subtypes were further classified into low pathogenic avian influenza (LPAI) and highly pathogenic avian influenza (HPAI) viruses depending on certain molecular markers besides to the morbidity and mortality rates which may reach at least 70% at intravenously in vivo inoculated specific pathogen free (SPF) chickens[3].

Markedly, HPAI viruses cause severe respiratory signs concomitant with high morbidity and mortality rate in poultry farms or that grow in backyards, in a contrast manner, LPAI viruses are just induce subclinical infections or sometimes case mild respiratory disease and slight reduction in egg production ensuing low mortality rate or mild spectrum of diseases in the wild birds which are considered as the main natural reservoir of influenza A viral subtypes[4].

Infection with HPAI viruses not only cause marked effect on poultry production leading to significant economic consequences, but it also had been reported to infect human, due to the affinity of Sialic acid receptors, representing real public health problem[5].

Unfortunately, LPAI viruses of HA subtypes H5 and also H7, may mutate under vague circumstances and adversely change into HPAI variants causing severe progressive disease that conducive to high mortality rates in both domestic and wild birds[6].
Globally, HPAI viruses of the H5N1 subtype were recorded in Asia, Middle East, Europe and Africa, resulting to heavy economic losses as a result of numerous harmful epidemics affecting both domestic poultry and wild birds; More recently, three another certain HPAI H5 subtypes emerged: H5N8 and H5N6 at the years, 2014 and 2017, respectively. In addition, to new LPAI subtypes, H5N2 and H9N2 were also recorded; many studies worldwide referred to that the last subtype is the more prevalent low pathogenic avian influenza subtype in poultry [7].

Generally, few Previous studies were involved AIV in domestic chickens in Iraq but neither of them involve most common viral subtypes, while, only one orphan study of them had included local poultry in backyards [8].

Studying of HPAI and LPAI infections are crucially important to obtain an active surveillance at our country to establish a reliable ground-work, in order to pinpoint and minimize the insidious hazards of these subtypes. Therefore, this study aims to determine the incidence, temporal spreads and spatial distribution of HPIVs and LPIVs in the domestic poultry throughout Iraq.

Materials and Method

Well sophisticated team of veterinarians were participated in sample collection randomly from 417 of chicken farms and flocks all over Iraq, ten random samples were taken from live birds at different sites of each farm and flocks besides to 5-10 of dead birds. In addition to 689 of local poultry (287 of local chickens, 165 of local ducks, 132 of local turkeys and 105 of local geese) that grew in the backyards from all Iraqi provinces.

Many but not all commercial chickens were vaccinated against avian flu subtype H9N2, Newcastle disease (ND) and infectious bronchitis disease (IBD).

The study was conducted from the beginning of August 2018 to the end of September 2019, farms that designated as infected with respiratory signs were defined as flocks characterized by core clinical respiratory signs such as, sneezing, coughing, rattling, dyspnea, nasal discharges snickering, depression and/ or diarrhea or central signs nervous which concomitant with clear rising of mortality rates within at least 3 days; respiratory signs were determined after excluding all positive samples that co-infected with ND and IBD.

Special Dacron tipped swabs were aseptically used for sample collection, Nasal swab had been taken from the each bird or fresh tracheal swab in case of newly dead birds, each sample was put in sealed insulated tubes, contain viral transport medium, termed as M199 solution [0.5% (w/v) certain sterile bovine serum albumin (BSA), 26106 U/L of penicillin, 200 mg/L of streptomycin, 26106 U/L of Polymyxin B, 250 mg/L of Gentamycin and 60 mg/L of Levofloxacin hydrochloride besides to 56105 U/L from Nystatin], all these tubes were kept on ice during collection and immediately preserved in a liquids nitrogen dry shipper for shipment to our laboratory and preserved inside specific deep freezer at -70°C until use [9,10].

Samples were prepared for RNA extraction through a prepared suspensions using a High Pure Viral Nucleic Acid extraction and purification Kit (Roche, Germany), based on the manufacturer’s protocol. The RNA suspension was divided into three equivalent parts of 100 μL and each part was used for AIVs, IB and ND viruses diagnostic tests; For diagnosis of avian influenza, infectious bronchitis besides to Newcastle disease viruses, we used One-step reverse transcription real time PCR (rRT-PCR) assay, through involving following primers and probes for AIV according to [11]:


Certain amplification condition consisted of a starting first reverse-transcription initial step at 45°C for 10 minutes, followed by Thermo-Cycling of 10 minutes at 95°C hot start and then by 45 PCR cycles of denaturation at 95°C for 10 seconds, annealing and extension at 60°C for 45 seconds and 65°C for 45 seconds, respectively, as originally mentioned by [11].

All AIV positive samples were subjected again for further examination searching for most common avian influenza HA and NA types which performed through using one-step rRT-PCR kit (Enzynomics, Korea), based on recommended method through utilizing multiple sets of numerous array of forward and reverse primers and probes, which done under implementation of manufacturer’s instructions [12].

The infections were classified as HPAI or LPAI in the present study depending on the results of intravenous inoculation of a ten susceptible 4 to 8 week old SPF...
chickens with viral subtypes; the strains were considered as a highly pathogenic if they cause more than 75% mortality within 10 days, if not, they are low pathogenic, based on original method described by[13].

Statistical analysis: We use SPSS software version 26 (IBM,NY,USA) through application of Chi-square (x²), to determine parameters difference among categorical data, p-value ≤ 0.01 were considered as statistically significant.

Results

The study reveal that the percentage of infection with AIVs was 7.04% (45/639) in the commercial chicken farms that suffering from respiratory signs at the study regions; Whereas, examination of random samples from local poultry growing in the backyards demonstrate that the percentage of infection in these birds was 4.93% (34/689)(Table 1).

Table (1): Percentages of Infection in the domestic poultry throughout all Iraqi Provinces.

<table>
<thead>
<tr>
<th>Provinces</th>
<th>Commercial Chicken Farms</th>
<th>Local Domestic poultry</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Samples</td>
<td>No. of positive Samples</td>
<td>Percentage of Infection</td>
</tr>
<tr>
<td>Baghdad</td>
<td>49</td>
<td>4</td>
<td>8.16%</td>
</tr>
<tr>
<td>Al-Basrah</td>
<td>47</td>
<td>3</td>
<td>6.38%</td>
</tr>
<tr>
<td>Babil</td>
<td>46</td>
<td>7</td>
<td>15.21%</td>
</tr>
<tr>
<td>Arbil</td>
<td>44</td>
<td>2</td>
<td>4.54%</td>
</tr>
<tr>
<td>Ninawa</td>
<td>41</td>
<td>3</td>
<td>7.31%</td>
</tr>
<tr>
<td>Al-Najaf</td>
<td>41</td>
<td>4</td>
<td>9.75%</td>
</tr>
<tr>
<td>Al-Karbela</td>
<td>39</td>
<td>3</td>
<td>7.69%</td>
</tr>
<tr>
<td>Al-Anbar</td>
<td>38</td>
<td>2</td>
<td>5.26%</td>
</tr>
<tr>
<td>Wasit</td>
<td>36</td>
<td>1</td>
<td>2.77%</td>
</tr>
<tr>
<td>Al-Qadisiyyah</td>
<td>35</td>
<td>2</td>
<td>5.71%</td>
</tr>
<tr>
<td>Dahuk</td>
<td>33</td>
<td>3</td>
<td>9.09%</td>
</tr>
<tr>
<td>Dhi-Qar</td>
<td>32</td>
<td>4</td>
<td>12.50%</td>
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<tr>
<td>Diyela</td>
<td>30</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>As-suleymaniyyah</td>
<td>28</td>
<td>1</td>
<td>3.57%</td>
</tr>
<tr>
<td>Salahad-Din</td>
<td>27</td>
<td>3</td>
<td>11.11%</td>
</tr>
<tr>
<td>Al-Muthanna</td>
<td>25</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Maysan</td>
<td>24</td>
<td>2</td>
<td>8.33%</td>
</tr>
<tr>
<td>Kirkuk</td>
<td>24</td>
<td>1</td>
<td>4.16%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>639</strong></td>
<td><strong>45</strong></td>
<td><strong>7.04%</strong></td>
</tr>
</tbody>
</table>

Further examination of all positive sample by use of specific rRT-PCR assay searching of the common AIV subtypes was recorded presence of following subtypes: H9N2, H5N1, H7N9, H5N8 and H5N2 at domestic poultry in Iraq, other viral subtypes were not observed.

The current study was reported that subtype H9N2 is the dominant type at both commercial chicken farms and local poultry that grew at backyards which came in percentages of 60.00% and 61.76%, respectively; with significant difference at level of p≤0.01 among all subtypes; Subtype H5N1 rank below in percentage of 17.77% at commercial chicken farms and 11.76% at domestic poultry that grew in the backyards; while the lowest incidence occur in H5N2 subtype at commercial chicken farms, 2.22%, in the other hand, the lowest subtype rate at local poultry was recorded with H5N8 subtype, 5.88% (Table 2).
The study revealed that all infections with H5N1, H5N8 and 28.57% (2/7) of H7N9 subtypes were highly pathogenic, whilst, 100% of infections with H9N2, H5N2 and 71.42% (5/7) of H7N9 appeared as low pathogenic pattern results shown in Fig. 1.

Table (2): Percentages of Infection in domestic poultry with Different Viral Subtypes.

<table>
<thead>
<tr>
<th>Viral Subtypes</th>
<th>Commercial Chicken Farms</th>
<th>Local Domestic poultry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Positive Samples</td>
<td>Percentage of Infection</td>
</tr>
<tr>
<td>H9N2</td>
<td>27</td>
<td>60.00%*</td>
</tr>
<tr>
<td>H5N1</td>
<td>8</td>
<td>17.77%</td>
</tr>
<tr>
<td>H7N9</td>
<td>5</td>
<td>11.11%</td>
</tr>
<tr>
<td>H5N8</td>
<td>4</td>
<td>8.88%</td>
</tr>
<tr>
<td>H5N2</td>
<td>1</td>
<td>2.22%</td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>100%</td>
</tr>
</tbody>
</table>

*p≤0.01

Figure (1): Graphic Results for AIVs Positive Samples that Obtained by rRT-PCR, Thermo-cycler: Exicycler™ technique, Quantitative Thermal Block, Korea. Five Amplification curves belong to the Five recorded subtypes.

Discussion

Avian influenza viruses are ubiquitous pathogens imposing great human and animal health problems, conducive to heavy economic loses in poultry production besides to their risks for all mammals including man; Since about three of four consensus pandemic human influenza outbreaks during past century were ensued from a genetic re-assortment of avian influenza viruses[14].
Our study reveal that the percentage of infection with AIVs was 7.04% (45/639) in the commercial broiler chicken farms and flocks at the study regions; this infection rate was drastically lower than that found by Abdul-Sada, 2015 [8] in Iraq, who registered that AIVs were present in 63.1% (89/141) of the broiler flocks.

This remarkable variation might be attributed to involving flocks with respiratory signs only, in the last two studies, while in the current study we collected the samples randomly from commercial farms and flocks, in addition to the difference in the number of samples and numerous managements conditions of the flocks.

The examination of random samples from local poultry that growing in the backyards was pointed out that the percentage of infection in these birds was 4.93% (34/689).

The illegal stochastic trading of un-examined commercial poultry and also backyard birds into live bird markets (LBMs) is common besides to continuous exposure of these chickens to the wild birds (natural reservoir of AIVs) during their life might emphasize the elevated incidence of the virus in local chickens that grew at backyards.

Further examination of all positive sample by use of specific rRT-PCR assay searching of the common AIV subtypes was recorded presence of following subtypes: H9N2, H5N1, H7N9, H5N8 and H5N2 at domestic poultry in Iraq, other viral subtypes were not observed.

According to our knowledge, this is the first study that recorded H5N1, H7N9, H5N8 and H5N2 subtypes at the domestic poultry in Iraq.

It is clearly important to investigate the spreading and occurrence of AIVs subtypes through a consecutive and comprehensive surveillances in a periodic way at our country. The updating of the information about viral subtypes are substantially needed in everywhere at every time in order to predict or prohibit of future pandemics.

The current study explained that subtype H9N2 is the predominant type at both commercial chicken farms and local poultry that grew at backyards which came in percentages of 60.00% and 61.76%, respectively with significant difference at level of p≤0.01 among all subtypes; also it is geographically distributed more than other subtypes; Subtype H5N1 rank below in percentage of 17.77% at commercial chicken farms and 11.76% at domestic poultry that grew in the backyards. .

The domination of H9N2 subtype in this study came in alignment with majority of the studies, worldwide, like the study of Hassan et al., 2016 [15] in Egypt (nearby country) who found that this subtype is predominant and represent 41.7% from AIV subtypes followed by H5N1 in 26.7% and study of Kandeil et al., 2019 [16] which reported that H9N2 was formed 48% of all AIV in Egypt followed H5N8, 37.1%. Such scenario might be due to that this subtype is the original type in birds[6].

Contrast finding was observed by Lee et al., 2017[17] in South Korea. They Observed that H5 was the most prevalent among all AIVs subtypes and came in 23.9% of these subtypes; that might be attributed to geographical distribution, kind of assay, sample size and ornithogenic causes.

We observed that all infections with: H5N1, H5N8 and 28.57% (2/7) of H7N9 subtypes were highly pathogenic, whilst, 100% of infections with H9N2, H5N2 and 71.42% (5/7) of H7N9 appeared as low pathogenic pattern.

Interestingly, the cosmopolitan distribution of most AIVs subtypes and the pathogenic patterns of some subtypes like H5Nx and H7Nx remain unclear and vague under certain circumstances particularly regarding the shifting from low to high pathogenic forms, further global studies are required to illuminate their epidemiology and pathogenicity [4,18].

Indeed, the commercial poultry - backyards cycle at LBMs in Iraq is closely integrated that can create a good niche for subtypes spread or even re-assortment events and any breach may eminently affect poultry production and endanger public health, since its seemingly can easily pass host species barriers, so, providing of a precise and sufficient informative data concerning AIVs subtypes at our country is of crucial necessity.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding

**References**


Assessment of the Relationship between Obesity and Female Breast Carcinoma in Imamein Kadhumain Medical City

Anees K. Nile1, Alnahrain1, Mohammed A. Hamdawi2, AlaaMaan Nassier3

1Prof. Dr. College of Medicine/Al-Nahrain University/Iraq, 2Lec. Dr. College of Medicine/Al-Nahrain University/ Iraq, 3Specialist/Imamein Kadhumain Medical City/Ministry of Health/Iraq

Abstract

Background: Obesity, measured by body mass index (BMI), is a well-known danger feature for a widespread variation of illnesses. Yet, in breast carcinoma (B.Ca.) the link is a little discussed and differs according to different entities.

Aims: This study aimed to assess the relationship between obesity and breast cancer in premenopausal women.

Subjects and Method: This is a prospective study in which 800 women who were attending breast clinic in Al-Imamain Al-Kadhumain Medical City/Baghdad during the period from January 2016 to December 2017 were followed up for the occurrence of BCa. of these, 50 women who developed BCa during this period were selected to represent cases group. Other 50 age-matched women who did not have BCa were selected to represent control group. General obesity (BMI) and central obesity (waist circumference (WC), hip circumference (HC) and waist/hip ratio (WHR)) were measured obtained from each patients either by direct interview or from patient’s record.

Results: Demographic, reproductive and laboratory data were comparable between the two groups. Stratification of BMI revealed significantly less cases having BMI < 25 and more having BMI>30 than controls. Moreover, cases showed significantly higher mean of WC (84.12±6.22 cm) than controls (77.6±7.18 cm), Regarding hormonal receptor statuses, mean BMI (30.18± 9.21 kg/m2) was significantly higher in hormonal receptor negative cases compared to 26.31±9.1 kg/m² in estrogen and progesterone receptors positive with significant difference. Conclusions: These data shows that obesity is a possible risk factor for breast carcinoma in premenopausal women.

Keywords: Relationship, Obesity, Female Breast Carcinoma, Imamian Khdymian Medical City.

Introduction

Worldwide, breast cancer (BCa) is the most frequently occurring malignancy among women, accounting for about 18% of all female cancers [1]. In 2012, the number of new cases among women was 1.7 million (about quarter of all cancer cases), with more cases observed in the developed countries (883,000 cases in developed versus 794,000 in developing countries)[2]. In Iraq, BCa comprises for about one-third of female cancers[3]. So far, the exact causes of BCa are not fully clarified; however, many risk factors such as family history[4], life style[5], adipoprotein levels[6] and age at menarche[7] were well illustrated. On the other hand, genetic factors were subjected to massive investigations and many genetic loci have been found to strongly associate with this malignancy[8]. However, the role of many other factors, such as obesity and oral contraceptive pills remained controversial issues [9,10]. The association of obesity with the incidence of BCa is a very complicated. For better understanding of this

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effect, the impact of obesity on BCa is firstly illustrated in general term and then the BCas is overlooked in premenopausal period, then each category is further specified according to estrogen and progesterone receptors [11]. Several mechanisms have been proposed for the effect of excess adipose tissue on tumorigenesis. Recently, Divella et al. proposed that the extra adipose tissue connected to the variations of the lipids focuses in the blood stream, stages of class responsive oxygen as well as to excretion of adipokines and blood stream hormones [12]. Inflammation become chronic in the adipose tissue and occur due to hypertrophy and hypoxia so cytokines secretion occur as a result of inflammation of adipose tissue, angiogenic factors excretion, macrophages M1 infiltration and resistance of insulin related to obesity and stimulus of a favorable microenvironment for tumorigenesis. Blucher and Stadler (2017) state that molecular mechanism that describes the communication between fat and BCa. Increase the fat, adipose become enlarge and increase triglycerides (TAGs) level with increase secretion adipokines and pro-inflammatory cytokines. These particles are chemoattractant for macrophages lead to lipolysis and release raised quantities of free fatty acids (FFAs). High mount of fatty acids could be a straight instrument through which adiposity may stimulate cancer development [13]. Despite the importance of BMI as an indicator for obesity, other body size indices, particularly waist circumference (WC), hip circumference (HC) and waist-to-hip ration (WHR), were profoundly found to have a role in BCa. A term of “central obesity” was used to express the ratio between WC and HC. Central obesity, or abdominal obesity, well-defined as extreme abdominal fat cover the stomach and abdomen [14] and is designated by WHR and WC. Of special importance regarding the BCa is the presence or absence of estrogen receptor and, to less extension, the progesterone receptors. This study aimed to assess the relationship between obesity and breast cancer in premenopausal women.

**Method**

Approximately 800 women (age range 21-48 years, mean 37.43±8.9) who were attending breast clinic in Al-Imamain Al-Kadhmain Medical City/Baghdad (for early detection) during the period from January 2016 to December 2017 were followed up for the occurrence of BCa. of these, 50 women who developed BCa during this period were selected to represent cases group. Other 50 age-matched women who did not have BCa were selected to represent control group. The inclusion criteria for case were being between 20 and 48 years old with BCa was investigated by fine needle aspiration (FNA). The controls were apparently healthy women who had normal ultrasound and mammogram findings and having no evidence for cancer. The exclusion criteria are those: with genetic breast ca. and post-menopausal women. Data were collected from both cases and controls through direct interview or patients records whenever possible. Four kinds of data were collected.

1. Demographic data: age, height, weight, educational level (high, intermediate, low), smoking status (never, ex/current), dwelling (rural, urban), waist circumference and hip circumference.
2. Physiological and reproductive features: age at menarche, number of births and breast feeding.
3. Family history of BCa: first or second degree relative with BCa
4. Laboratory investigations: only for cases and included status of hormonal receptor (estrogen receptor and progesterone receptor). Cases who were not having such investigation were excluded from the study.

Statistical package for Social Sciences (SPSS version 20) was used for data analysis. Continuous variables were expressed as a mean± standard deviation (SD), while categorical variables were expressed as percentages. a P≤0.05 was considered statistically significant.

**Results**

**Demographic and Reproductive Characteristics of the Study Population:** The baseline characteristics of BCa patients and controls are shown in table 1.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Cases (n=50)</th>
<th>Controls (n=50)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>36.81±5.12</td>
<td>34.23±6.4</td>
<td>0.324</td>
</tr>
<tr>
<td>Overall BMI</td>
<td>29.48±3.12</td>
<td>26.52±6.09</td>
<td>0.068</td>
</tr>
<tr>
<td>BMI&lt;25</td>
<td>7(7.14%)</td>
<td>16(16.32%)</td>
<td>0.031</td>
</tr>
<tr>
<td>BMI 25-30</td>
<td>31(30.62%)</td>
<td>30(28.88%)</td>
<td>0.83</td>
</tr>
<tr>
<td>BMI 30-50</td>
<td>12(12.24%)</td>
<td>4(4.8%)</td>
<td>0.026</td>
</tr>
<tr>
<td>Age at menarche</td>
<td>12.22±1.14</td>
<td>13.2±1.67</td>
<td>0.081</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of birth</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nulliparous</td>
<td>22(44%)</td>
<td>16(32%)</td>
<td>0.486</td>
</tr>
<tr>
<td>1-2</td>
<td>19(38%)</td>
<td>23(46%)</td>
<td>0.259</td>
</tr>
<tr>
<td>≥3</td>
<td>9(18%)</td>
<td>11(22%)</td>
<td>0.351</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration of breastfeeding</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>19(38%)</td>
<td>16(24%)</td>
<td>0.294</td>
</tr>
<tr>
<td>≤ 6 months</td>
<td>18(36%)</td>
<td>17(34%)</td>
<td>0.18</td>
</tr>
<tr>
<td>&gt; 6 months</td>
<td>13(26%)</td>
<td>17(34%)</td>
<td>0.233</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diabetes mellitus</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>46(92%)</td>
<td>46(92%)</td>
<td>1.0</td>
</tr>
<tr>
<td>Yes</td>
<td>4(8%)</td>
<td>4(8%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Family history</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>43(86%)</td>
<td>48(96%)</td>
<td>0.073</td>
</tr>
<tr>
<td>Yes</td>
<td>7(14%)</td>
<td>2(4%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Educational level</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>9(22.6%)</td>
<td>14(27.7%)</td>
<td>0.498</td>
</tr>
<tr>
<td>Intermediate</td>
<td>24(45.2%)</td>
<td>21(40%)</td>
<td>0.270</td>
</tr>
<tr>
<td>High</td>
<td>17(38.7%)</td>
<td>15(32.3%)</td>
<td>0.307</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Smoking</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>48(96%)</td>
<td>49(98%)</td>
<td>0.554</td>
</tr>
<tr>
<td>Ex/current smoker</td>
<td>2(14.3%)</td>
<td>1(2%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Using of contraceptive</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>39(78%)</td>
<td>43(866%)</td>
<td>0.296</td>
</tr>
<tr>
<td>Yes</td>
<td>11(22%)</td>
<td>7(14%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Residence</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>13(26%)</td>
<td>21(42%)</td>
<td>0.093</td>
</tr>
<tr>
<td>Urban</td>
<td>37(74%)</td>
<td>29(58%)</td>
<td></td>
</tr>
</tbody>
</table>

Interestingly, cancer occur more in obese women and those taking contraceptives than control, although the differences did not rise to a significant level (P=0.068 and 0.296 respectively).others have no significant differences.

**Distribution of Body Mass Index:** Stratification of this index did. Women with BMI below 25 kg/m² were more frequent among controls (16, 32%) than case (7, 14%) with significant difference (P=0.03). In contrast, women with BMI over 30 kg/m² were far more frequent among cases (12, 24%) than controls (4, 8%) with significant difference (0.026) as shown in figure 1.
**Figure 1: Body mass index stratification in cases and controls**

**Waist and Hip Circumferences:** Figure 2 shows waist and hip circumferences in BCa patients and controls. For waist the circumferences were 84.12±6.22 cm and 77.6±7.18 cm respectively with significant difference (P=0.028). Likewise, BCa shows higher mean hip circumference (98.74±12.71 cm) than controls (92.17±9.14 cm); however, the difference was not significant (P=0.069).

**Figure 2: Waist and hip circumferences in breast cancer cases and controls**
Discussion

This study aimed to assess the role of obesity as a risk factor for BCa. Apart from obesity, there was no significant differences in all studied risk factors between the two groups and this will highly assist to evaluate the role of obesity in BCa. The study revealed interesting results. Below 25 kg/m², BMI showed a significant negative association with BCa, while this association was positive with BMI greater than 30 kg/m². A recent study performed by Wang et al. involving 2800 Chinese women revealed that BMI greater than 32 kg/m² was positively influence the occurrence of BCa especially in premenopausal women[11]. In another study including 183940 Japanese women, Wada et al. reported a significant positive association between BMI and premenopausal BCa[15]. Obesity considered as a danger factor for BCa[16]. Yu et al. stated that increase BMI was meaningfully connected with BCa among Asian women[17]. Renehan et al. stated that there is a relation between increase BMI and both before and after menopausal BCa in Asian-Pacific women[18] obtained almost similar result. Other studies, although have shed a light on obesity as a risk factor for BCa, but they neglected other very important factors which influence this association such as the body size indices (waist and hip circumferences), hormone receptor status and the period at which BCa occurs whether pre- or postmenopausal. Reduction in weight as Amandu et al. noticed have different percentages of BCa reduction among races. These differences in results may be attributed to many factors, the most important of which is the ethnicity, dietary life style. Furthermore, these data indicate that there are no standard values of BMI, which could be considered as risk for or protect from BCa. [19]

One of the most prominent results in the current study was that WC but not HC nor WHR is significantly associated with increased risk of BCa in premenopausal women. Compared with the other international studies, this results are in accord with that reported by Wang et al. who found that WC was positively associated with BCa among premenopausal Chinese women[10].

Stratification of BMI according to hormonal receptor statuses in the current study showed a significant difference in mean BMI between HR-negative group and ER/PR positive group. This implies two facts. The first one is that even in peremenopause woman negative for both receptors, BMI$\geq$30 kg/m² can predispose for BCa and women positive for both receptors are at increased risk of BCa even with slight obesity. The second fact is that the effect of obesity is more prominent in hormonal receptor negative women. These results are in agreement with that obtained by Munsell et al. who analyzed 16 case/control studies and reported a significant decreased in premenopausal BCa risk in obese women positive for hormonal receptors (OR=0.78, 95% CI=0.67-0.92) but not for those negative for hormonal receptors[20]. Another large study included 1149 BCa women, obesity was found to decrease risk of the disease in premenopausal women positive for hormonal receptors [21]. There is no clear explanation for this negative association between BMI and hormonal receptor statuses as risk factors for BCa in premenopausal women[22]. Renehan et al. analysed 20 cohort and case/control studies including more than 2.5 million women and 7930 premenopausal BCa and reported a 8% decreases in the incidence of this malignancy for every 5-point increase in BMI [18]. Interestingly, the reduced risk was seen in hormone receptor-positive but not hormone receptor negative. Supporting these reports are two large meta-analyses involved 6106 and 2468 premenopausal women with ER+ BCa. of note, this inverse association was restricted to white women, while null association was found in African American women[23,24]. However, this reduction in BCa with obesity was not seen in all studies. A meta-analysis of 12 population based studies[25] showed different results. i.e. increased BMI in premenopausal women was connected with an increased danger of ER+ or PR+ BCa. Furthermore, the BCa Inhibition trial, which included 5864 females, stated that obesity was significantly related with advanced premenopausal BCa. Thus, it seemed that other factors, particularly ethics, have a crucial role in formulation the association of obesity with premenopausal BCa. On the other hand, studies regarding the effect of obesity on HR- BC are vealed either positive association or no association at all. Two meta-analysis of 620 females and 1358 females with HR- BCstated 80% and 43% advanced danger for BCa in premenopausal females correspondingly[24,25], while an Indian case/control study on HR- menopausal women failed find any significant association between obesity and BCa[26].

Conclusions

These data shows that obesity is a possible risk factor for breast carcinoma and possibly has poor prognosis because of negative hormone receptor status in obese women with breast carcinoma.
Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

Funding: Self-funding

References


Impact of Age at Starting Cysteamine Therapy on Serum Chitotriosidase in Cystinotic Iraqi Children

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Abstract

Cystinosis is a rare autosomal recessive lysosomal storage disease with high morbidity and mortality. It is caused by mutations in the CTNS gene that encodes the cystine transporter, cystinosin, which leads to lysosomal cystine accumulation. It is the major cause of inherited Fanconi syndrome and should be suspected in young children with failure to thrive and signs of renal proximal tubular damage. The diagnosis can be missed in infants, because not all signs of renal Fanconi syndrome are present during the first months of life. Elevated white blood cell cystine content is the corner stone for the diagnosis. Since chitotriosidase (CHIT1 or chitinase-1) is mainly produced by activated macrophages both in normal and inflammatory conditions. Which suggests that cystinosis should be included in the differential diagnosis of disorders with increased plasma chitotriosidase activity. This study is aimed to investigate the impact of cystinosis on the renal function in relation to age at detection and initiation of treatment course, besides estimating serum chitotriosidase level, as a screening marker and therapeutic monitor for cystinosis disease in Iraqi children with cystinosis.

The present study is a case-control study included a samples of 30 children with nephropathic cystinosis, compared to 25 healthy control children from those attending at The Genetic Rare Diseases Center/AL-EmamAIN AL-Kadhimain teaching hospital, Baghdad-Iraq.

Our results report patients who started taking the medication (cysteamine) before two years of age were presented with significantly lower levels of cystine and chitotriosidase in addition to better renal function (higher GFR) (P-value = 0.0001). In other words, earlier treatment led to better disease control and less deterioration of renal function.

In conclusion serum chitotriosidase activity estimation might aid in monitoring therapeutic benefit of cysteamine therapy and the prognosis of the disease when WBC cystine assessment is not available.

Keywords: Cystinosis, Cysteamine, Chitotriosidase.

Introduction

Cystinosis is a rare autosomal recessive lysosomal storage disease with high morbidity and mortality. It is caused by mutations in the CTNS gene that encodes the cystine transporter, cystinosin, which leads to lysosomal cystine accumulation. Three clinical forms of cystinosis can be distinguished depending on the age at presentation and the degree of disease severity. (1) Infantile Nephropathic Form: Also known as renal Fanconi syndrome, the most frequent and most severe form of the disease. Patients are generally present before the age of 12 months with polyuria, polydipsia and failure to thrive, caused by generalized proximal tubular damage. (2) Late-Onset or Juvenile Nephropathic Form: Also known as Intermediate Cystinosis, Adolescent Form, which is characterized by the same symptoms

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as infantile cystinosis, but with a disease onset mostly after the first decade of life and a slower rate of disease progression\(^2\). (3) Ocular Non-nephropathic Form of Cystinosis: Also known as Non-nephropathic adult Form, Benign Non-nephropathic Cystinosis, which is characterized by photophobia due to corneal cystine crystals deposits, while other organs remain spared\(^3\).

Early symptoms of classical nephropathic cystinosis include renal tubular Fanconi syndrome, rickets, impaired growth, hypothyroidism and photophobia\(^4\). However, cystine accumulation continued in non-renal organs, including the muscle, brain, bone marrow, liver, spleen, lymph nodes, cornea, conjunctiva, thyroid, pancreas, testes and intestines\(^5\). Consequently, the clinical course of cystinosis changed from that of a largely renal disease to that of a multisystemic disorder with significant non-renal involvement, including a distal vacuolar myopathy, decreased pulmonary function, swallowing impairment, deterioration of the central nervous system (CNS), endocrinopathies, vascular calcifications, retinal damage and other ophthalmic complications\(^6\). Definitive diagnosis is based upon a high index of suspicion because of the clinical presentation including: polyuria, thirst, failure to thrive, growth retardation, vomiting, periods of dehydration, constipation, developmental delay and rickets in some patients. Biochemically, the patients were presented with hypokalemia, hypophosphatemia, metabolic acidosis, low serum uric acid, low carnitine, and, sometimes, hyponatremia. Proteinuria can reach grams per day and consists of LMW proteins, albumin and high molecular weight proteins\(^7\) supported by slit lamp examination of the corneas showing crystals, which are generally present by 16 months of age. The detection of elevated intracellular cystine content is the cornerstone for the diagnosis\(^8\).

Nationwide birth prevalence data concerning cystinosis are only reported in few populations. However, the prevalence of cystinosis in Iraq about is 163 patients according to data collected from The Genetic Rare Diseases Center/AL-Emamain AL-Kadhimain Teaching Hospital, Baghdad-Iraq. This study was approved by the Ethics Committee of the College of pharmacy/University of Baghdad. All participants were informed about the aim and the proposed benefits of the study before obtained their agreements. Apparently healthy individuals (25) were included to serve as a control group.

Cystinotic children included in the study were those aged less than 10 years, and diagnosed to have cystinosis according to clinical symptoms of disease and eye examination; demonstrating corneal cystine crystals. Whereas the exclusion criteria were:

- Patients that have other inborn error of metabolism.
- Patients that have any endocrinopathy (DM, thyroid disorder, congenital adrenal hyperplasia).
- Patients that have other renal disorders (nephrotic syndrome, CKD, Fanconi syndrome/not related to cystinosis).

Data Collection: The patient’s information sheet included all the recorded details: anthropometric measures, medical and social history that are related to the clinical diagnosis of cystinosis patients, as summarized in table (1). The questionnaire was posed to patient parents who were diagnosed with cystinosis at the time of a regular renal care follow-up visit to the hospital.
Table 1: Patients & Control Demographics and Disease Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Patient group (Mean± SD)</th>
<th>Control group (Mean± SD)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (months)</td>
<td>65.20 ± 34.27</td>
<td>62.32 ± 35.45</td>
<td>.728</td>
</tr>
<tr>
<td>Gender (M/F)</td>
<td>(17/13)</td>
<td>(13/12)</td>
<td>.729</td>
</tr>
<tr>
<td>Weight (Kg)</td>
<td>11.20 ± 3.00</td>
<td>22.28 ± 10.71</td>
<td>.0001*</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>87.27 ± 11.88</td>
<td>108.56 ± 18.98</td>
<td>.0001*</td>
</tr>
<tr>
<td>BMI kg/m²</td>
<td>14.68 ± 2.36</td>
<td>17.71 ± 2.96</td>
<td>.0001*</td>
</tr>
<tr>
<td>Cystine (nmol/mg protein)</td>
<td>2.98 ±1.80</td>
<td>0.20 ± 0.06</td>
<td>.0001*</td>
</tr>
<tr>
<td>S. Creatinine (µmol/L)</td>
<td>179.76 ± 177.53</td>
<td>38.86 ± 14.16</td>
<td>.0001*</td>
</tr>
<tr>
<td>Chitotriosidase(nmol/hr/ml)</td>
<td>308.30 ± 134.789</td>
<td>115.96 ± 32.44</td>
<td>.0001*</td>
</tr>
<tr>
<td>GFR (mL/min/1.73 m²)</td>
<td>44.09 ± 37.64</td>
<td>110.13 ± 12.16</td>
<td>.0001*</td>
</tr>
<tr>
<td>S. Calcium (mmol/L)</td>
<td>1.80 ± 0.55</td>
<td>2.15 ± 0.20</td>
<td>.004*</td>
</tr>
<tr>
<td>Age at diagnosis (months)</td>
<td>25.60 ± 20.88</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Duration of disease(months)</td>
<td>39.53 ± 33.24</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dose of Cysteamine (mg/kg/day)</td>
<td>56.67±7.581</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cysteamine Frequency</td>
<td>3.9 ± .712</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Treatment duration(month)</td>
<td>19.93 ± 28.89</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Age when treatment started (month)</td>
<td>45.27 ± 31.04</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

N for patients=30, N for Control=25, SD=Standard deviations, GFR=Glomerular Filtration Rate, Normal S.Cr range is 26 to 62 µmoles/liter, Normal cystine level (Mixed leukocytes test) is less than 0.2 nm/mg protein, Normal S. Calcium range is 2.2-2.6 mmol/L, Normal BMI range is 18.5 to 24.9, Normal Chitotriosidase level is < 78.5 nmol/hr/ml.

Sample Collection and Preparation: From each participant (patient and control subjects), venous blood samples were collected after at least 6 hours from taking treatment (Cysteamine). Six milliliters was withdrawn, about (2 ml) was transferred to a tube containing Lithium Heparin and stored at (+2 to +8 °C, for several hours) to be taken it to the laboratory for separation of white blood cell (WBC) to be used for measuring cystine content by applying high performance liquid chromatography (HPLC) (12).

The other part (4 ml) of the blood sample was transferred to a plane tube and centrifuged at (3000 rpm) for 5 minutes to obtain serum, which is used for the measurement of creatinine and calcium level. The remaining aliquot of serum was kept in eppendorff tubes and frozen at (−20°C) for later analysis of serum chitotriosidase concentration. Also, urine specimens were collected using urine cups from each participant for measuring glucose in urine. Laboratory assay procedures were blinded for assays (regarding the sample was for a control or a patient) of the participants. Samples were assayed in a random order. Because, the lack of blinding could have introduced bias into the assessment of subjective outcomes such as health-related quality of life and adverse events. Additionally, it’s the first time to measure cystine level in Iraq for those patients.

Statistical analysis: The analyses were conducted using the Statistical Package for the Social Science (SPSS, version 22, IBM, New York, USA). Descriptive statistics (means, standards deviations, frequencies and percentages) of the participants (both patient and control group) were calculated. Because the variables were not normally distributed, we used non-parametric tests including Mann-Whitney (between 2 groups) tests to measure the difference in multiple measures according to participating groups (patient vs control) and different age groups. Spearman correlation was used to measure the relationships among different measures in patient group. A p-value of less than 0.05 was considered to be significant statistically.

Results

Patients & Control Demographics and Disease Characteristics: The participating patients aged
between 1.5 and 10 years (18 and 120 months) with average age of (5.4 years)(± SD 2.86)/(65.20 months) (± SD 34.27). The control group had a comparable age to patients group with average age of (5.2 years)(± SD 2.96)/(62.32 months) (±SD 35.45) and ranged between one and 10 years old (12 and 120 months). Control group included 13 male participants (52.0%) and 12 (48.0%) female. The thirty cystinotic patients, included (17 male) and (13 female) representing 56.7% and 43.3% respectively (Table -1).

Considering BMI, the patients BMI level is below normal, as compared to the control group (P-value <0.05). Meanwhile, lower weight, height, GFR and serum calcium measures were recognized compared to control group. On the other hand, the control children had significantly lower levels of serum creatinine, cystine and chitotriosidase levels compared to patients group (Table -1 & Figure-1).

The children were about two years old in average when they were diagnosed with the disease (cystinosis). The patients also had abnormally higher levels of cystine, creatinine and Chitotriosidase. In contrast, they had abnormal lower levels of serum calcium and GFR (glomerular filtration rate). In average, the treatment started after 20 months of the disease diagnosis (Table -1). Additionally, the average disease duration in patients group was about 40 months, while the average duration of the treatment was half this period (about 20 months). In other words, the patients had an average of 20 months without treatment due to unavailability of the medication (cysteamine) additionally the medication is too expensive.

The average doses as prescribed by physician were 56.67 mg/kg/day (±SD 7.581) ranging between 40mg/kg/day for newly diagnosis patient to 60mg/kg/day for the patients that had been diagnosed some time ago, the newly diagnostic patients were started at (40 mg/kg/day) to be increased over the course of 4 to 6 weeks until reaching a dose of (60 mg/kg/day), whereas the average doses frequency was 4.00 (±SD 0.695) (range 3-5 times daily).

### Figure 1: Comparison between different parameters of control and patients

*Significant (P-value <0.05) difference between mean rank

**Difference in Disease Measures According to Age at Starting Medication (Cysteamine):** Patients who started taking the medication (cysteamine) before years two of age were presented with significantly lower levels of cystine and chitotriosidase in addition to better renal function (higher GFR values) (P-value = 0.0001) (Table-2). In other words, earlier treatment led to better disease control and less deterioration of renal function.
Table 2: Difference in the Disease Measures According to Age for Starting Medication (Cysteamine)

<table>
<thead>
<tr>
<th>Disease parameter</th>
<th>Treatment starting age (month)</th>
<th>N</th>
<th>Mean Rank</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chitotriosidase (ŋmol/hr/ml))</td>
<td>0-24</td>
<td>13</td>
<td>7.54</td>
<td>.0001*</td>
</tr>
<tr>
<td></td>
<td>&gt;24</td>
<td>17</td>
<td>21.59</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30</td>
<td>7.92</td>
<td>.0001*</td>
</tr>
<tr>
<td>Cystine (ŋmol/mg protein)</td>
<td>0-24</td>
<td>13</td>
<td>7.92</td>
<td>.0001*</td>
</tr>
<tr>
<td></td>
<td>&gt;24</td>
<td>17</td>
<td>21.29</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GFR (ml/min/1.73 m²)</td>
<td>0-24</td>
<td>13</td>
<td>23.54</td>
<td>.0001*</td>
</tr>
<tr>
<td></td>
<td>&gt;24</td>
<td>17</td>
<td>9.35</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant (P-value< 0.05) according to Mann-Whitney test

Discussion

The Relationship between Age at Starting Cysteamine Therapy and Kidney Functional Outcomes in Nephropathic Cystinosis: Nephropathic cystinosis is a systemic disease that results in kidney failure at the end of the first decade of life when untreated (13) or even when treatment is initiated after 5 years of age with immediate release cysteamine therapy. In spite of cysteamine is not ordinarily able to reverse Fanconi syndrome but in some isolated cases of prenatal diagnosis who starting of cysteamine therapy through the first weeks of life averted the occurrence of the renal tubular disorder (14). The importance of early treatment was reported by Gahl among others, by estimating that for every month of treatment prior to 3 years of age, finding that 14 months’ worth of later renal function were preserved (15).

As shown in table (3) the patients were categorized into two groups: A-Children started cysteamine therapy before 2 years of age (n=13, 43.3%), B- Children started cysteamine therapy after 2 years of age (n=17, 56.7%).

GFR (glomerular filtration rate) was significantly increased in cysteamine treated patients before 2 years of age with average 82.53 (±28.46) in comparison with that started the treatment after 2 years of age had average 18.46 (±12.42). Additionally, the average WBC cystine level (a marker of disease control) in patients started the treatment before 2 years of age was 1.35 (±0.57) nmol ½ cystine/mg protein (therapeutic goal of cysteamine therapy must have average WBC cystine level < 2 nmol ½ cystine/mg protein) (16), while average WBC cystine level in patients started the treatment after 2 years of age 4.05 (±1.48) nmol ½ cystine/mg protein.

Besides that, the level of serum chitotriosidase is significantly lower than the patients who started the treatment after 2 years of age with average 176.92 (±48.24)(nmol/hr/ml), whereas those started therapy after 2 years 383.3 (±105.67) (nmol/hr/ml). Wherefore when the treatment applied before 2 years of age and with an average WBC cystine level < 2 nmol ½ cystine/ mg protein there was preservation for kidney function and limiting the renal deterioration, while after the age of two years, the glomerular filtration rate (GFR) was lowered as indicated by the increased serum creatinine which evolves to advanced CKD and hence, the serum levels of cystine and chitotriosidase were significantly increased. Data analysis of 30 child with nephropathic cystinosis shows that early treatment with cysteamine has a positive effect on the onset of renal and extrarenal complications.

A study by Cochat et al cystinotic patients reached ESRD at a mean age of 9.8 years, even though 83% had received treatment, probably due to the late introduction of cysteamine therapy (7.3 years) (17), while in the present study the average age at starting cysteamine treatment was 3.9 (ranged from 1–10) years and the patients reached ESRD at average age of less than 9.8 years, approximately 6.8 years in patients who started the treatment after 2 years of age and non-compliance to the treatment.

In conclusion serum chitotriosidase activity estimation might aid in monitoring therapeutic benefit
of cysteamine and the prognosis of the disease when WBC cystine assessment is not available, despite that chitotriosidase enzyme is not specific for this disease. However, it is believe a useful clinical screening test and a promising therapeutic monitor since a link between cystine accumulation and plasma chitotriosidase activity comes from the observation that plasma chitotriosidase activity and leukocyte cystine content ran in parallel and were both affected by the dosing regimen.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding

**Reference**

Asthma Knowledge and Behaviours among Parents of Asthmatic Children Attending Paediatric Hospitals in Mosul City

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Abstract

Background: Asthma is a common health problem among all age groups. It disturbs all aspects of children’s life and possibly changes to chronic disease that continues for the whole patient’s life. This research focused attention on the parental knowledge and practices during and between asthmatic attacks in order to identify improper activities and improve their future performance toward their children.

Objective: This research aims to demonstrate the degree of parental knowledge and behaviours toward their children during and between asthmatic attacks in Mosul City.

Method: A case series study was conducted among 312 parents of asthmatic children that attended Al-Khansaa and Ibn-Alatheer teaching hospitals (two major paediatric hospitals in Mosul City) over a period of 6 months. A questionnaire form derived from “the Arabic version of the Chicago Community Asthma Survey Questionnaire” was distributed among the participants to evaluate their demographic characteristics, myths, knowledge, and behaviours. Various rates and proportions are used to explain these variables.

Results: This study shows that most parents got information from doctors (62.2%), their best knowledge was about the precipitating factor for asthma as dust and smoke (78%) and the symptoms of asthma as dyspnoea (84.9%), while the least information were about the mechanism of disease where 26.9% did not know the exact mechanism, and the complications of asthma as sudden death (25.3%). On the other hand, the best parental behaviour was the regular use of medications during and between attacks (88.5% and 82.7%) and the lowest ones was performing breathing exercises (around 45%).

Conclusion and Recommendation: A relatively adequate knowledge and behaviours were documented in this study; however, further education about the recent guidelines for asthma management should be offered to those parents in order to improve their offspring health and lifestyle.

Keywords: Asthma, knowledge, behaviour, Mosul.

Introduction

Asthma is one of the important chronic diseases that affect all ages and both sexes with male predominance especially among children. It has considerable health adverse outcomes in terms of morbidity and mortality worldwide (¹).

Asthma is defined as “paroxysmal or persistent attacks of dyspnoea, chest tightness, wheezing, sputum production, and cough with variable airflow limitation and airway hyper-responsiveness to endogenous and exogenous stimuli” (²). Severe asthma in children is defined by World Health Organization (WHO) as “Uncontrolled asthma which can result in risk of frequent
severe exacerbations (or death) and/or adverse reactions to medications and/or chronic morbidity (including impaired lung function or reduced lung growth in children)”(3).

The prevalence of asthma varies greatly among countries. About 300 million people have asthma worldwide and another 100 million is expected to be affected by 2025 (4). A sharp increase in the prevalence of asthma has been demonstrated in developed countries since the 60s of the past century (1); however, more than 80% of deaths happen in low and middle income countries according to WHO recent reports (5).

In Iraq, the prevalence of asthma was 22.3% among primary school children according to a study conducted in 2005 in Baghdad (6), whereas a lower rate (8.9%) was demonstrated in 2009 in another study among older age group (11-14 years) (7). Different rates were registered in earlier studies (28.4%) for 6-12 years of age in Baghdad and 15.8% for <5 children in Basra (8).

Regardless the prevalence of asthma, it still a major health problem facing children and their families, affecting their quality of life, their school performance, creativity, and recreation, in addition to the financial burden on the country. Although it is chronic disease; however, the majority of children improve by time and their signs and symptoms relieve toward adulthood. Thus, exploring parental knowledge and practices toward their children during and between asthmatic attacks is very important in order to prevent and early treat such attacks and to prevent further suffering of those children.

Aim of the study: The aim of the present work is to determine parental knowledge and behaviours toward their children’s asthmatic attacks in Mosul City.

Methodology

Administrative Agreements: To facilitate the process of data collection and for ethical considerations, administrative agreements were obtained from “Family and Community Medicine Department/College of Medicine/University of Mosul”, followed by ethical and formal agreement from “Nineveh Health Directorate”.

Study Setting: This research was conducted in Mosul city; the centre of Nineveh governorate present in the north-west area of Iraq. It is the 2nd most populated governorate in the country after the capital Baghdad, with more than three and a half million population and a natural growth rate of almost 4%. The study sample was collected from two major paediatric hospitals in this city namely Al-Khansaa maternity and paediatric teaching hospital and Ibn Alatheer paediatric teaching hospital.

Study Sample: A convenient sample was collected from both hospitals involving 312 parents of asthmatic children. Those parents were asked about their myths, knowledge and behaviour toward their kids regarding the prevention and control of asthmatic attacks.

Study Design: A descriptive case series study is the most suitable design for such type of researches that concerned with demonstrating the knowledge, practice and attitudes of individuals toward certain disease or any health problem.

Study Period: The period required for conducting this research was 6 months from July 2019 to January 2020.

Data Collection Tool: The study instrument is a questionnaire form constructed from the modified “Arabic version of the Chicago Community Asthma Survey Questionnaire” (9) which had previously used in surveys of other Arabic countries. This form was distributed among 350 parents, and the analysis was done on 312 completed formula which involved information about socio-demographic characteristics, myths and believes, knowledge items, and behaviour items of the study participants.

Outcome Measures: Various rates and proportions were calculated to explore the degree of demographic characteristics, myths and believes, knowledge and behaviours items among the parents of asthmatic children.

Results

Table 1 summarized the socio-demographic characteristics of the participants and demonstrated that most of asthmatic children were aged ≤ 5 years, males, with duration of disease ≤ 2 years, negative family history of asthma, and living in urban areas, (51.6%, 60.6%, 61.5%, 58%, and 75% respectively). Around two thirds of the mothers (63.1%) were ≤ 30 years of age, and most parents were educated (76.6% of mothers and 81.4% of fathers), although living in middle and low social classes (47.4%, and 24.7% respectively).
Table (1): Socio-demographic characteristics of asthmatic children and their parents in Mosul City, Iraq

<table>
<thead>
<tr>
<th>Socio-demographic characteristics (n=312)</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child’s age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 5 years</td>
<td>161</td>
<td>51.6</td>
</tr>
<tr>
<td>&gt; 5 years</td>
<td>151</td>
<td>48.4</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>189</td>
<td>60.6</td>
</tr>
<tr>
<td>Female</td>
<td>123</td>
<td>39.4</td>
</tr>
<tr>
<td>Duration of asthma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 2 years</td>
<td>192</td>
<td>61.5</td>
</tr>
<tr>
<td>&gt; 2 years</td>
<td>120</td>
<td>38.5</td>
</tr>
<tr>
<td>Family history of asthma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>131</td>
<td>42</td>
</tr>
<tr>
<td>Negative</td>
<td>181</td>
<td>58</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>234</td>
<td>75</td>
</tr>
<tr>
<td>Rural</td>
<td>78</td>
<td>25</td>
</tr>
<tr>
<td>Maternal Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 30 years</td>
<td>197</td>
<td>63.1</td>
</tr>
<tr>
<td>&gt; 30 years</td>
<td>115</td>
<td>36.9</td>
</tr>
<tr>
<td>Maternal Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>73</td>
<td>23.4</td>
</tr>
<tr>
<td>Educated</td>
<td>239</td>
<td>76.6</td>
</tr>
<tr>
<td>Paternal Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>58</td>
<td>18.6</td>
</tr>
<tr>
<td>Educated</td>
<td>254</td>
<td>81.4</td>
</tr>
<tr>
<td>Social Class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>87</td>
<td>27.9</td>
</tr>
<tr>
<td>Middle</td>
<td>148</td>
<td>47.4</td>
</tr>
<tr>
<td>Low</td>
<td>77</td>
<td>24.7</td>
</tr>
</tbody>
</table>

Table (2): Parental believes and myths regarding the treatment of their children’s asthma in Mosul City, Iraq

<table>
<thead>
<tr>
<th>Parental believes and myths (n=312)</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is better not to use inhalers for long period</td>
<td>215</td>
<td>68.9</td>
</tr>
<tr>
<td>It is preferred to use inhaler directly</td>
<td>204</td>
<td>65.4</td>
</tr>
<tr>
<td>Asthma medications must be used during attacks only</td>
<td>199</td>
<td>63.8</td>
</tr>
<tr>
<td>Preventive medications can be used between attacks</td>
<td>192</td>
<td>61.5</td>
</tr>
<tr>
<td>Asthma medications should be stopped after the attacks</td>
<td>191</td>
<td>61.2</td>
</tr>
<tr>
<td>Inhalers can lead to addiction or dependence</td>
<td>157</td>
<td>50.3</td>
</tr>
<tr>
<td>Inhalers can affect the heart adversely</td>
<td>145</td>
<td>46.5</td>
</tr>
<tr>
<td>Even for mild attacks, the child should be admitted to the emergency room</td>
<td>119</td>
<td>38.1</td>
</tr>
</tbody>
</table>

Table 2 revealed that in general more than half of the parents had bad believes and myths about the management of asthma and its medication. Almost 68.9% said that it is better not use inhalers for long time, another two thirds (65.4%) preferred the direct use of inhalers, and 63.8% favoured their use only during attacks. To lesser extent, 50.3% thought that inhalers can lead to dependence, and 46.5% assumed that inhalers can harmfully affect the heart.

Table 3 demonstrated parental knowledge about asthma. For the mechanism, more than half said that it is due to bronchial obstruction by inflammation and bronchial narrowing (56.7% and 56.4%). More than three quarters of parents blamed dust and smoke as the main aggravating factors for asthma (78.8% and 78.2%). Most parents knew the symptoms of asthma where 84.9% of them declared dyspnoea as the commonest symptom followed by chest tightness, cough, and wheeze (76.6%, 67.3%, and 57.7% respectively). Whereas 91.3% said that severe dyspnoea is usually present in severe attacks. Approximately, two thirds (63.5%) of parents determined sleep disturbances as the main complication of asthma in comparison with only 25.3% for sudden death. The greater proportion of the participants got their information from paediatricians and general/family physicians (44.2% and 18%).

Table (3): Parental knowledge about bronchial asthma in Mosul City, Iraq

<table>
<thead>
<tr>
<th>Knowledge items (n=312)</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanism of asthma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bronchial obstruction due to inflammation</td>
<td>177</td>
<td>56.7</td>
</tr>
<tr>
<td>Bronchial narrowing</td>
<td>176</td>
<td>56.4</td>
</tr>
<tr>
<td>Bronchial obstruction by mucus</td>
<td>124</td>
<td>39.7</td>
</tr>
<tr>
<td>Do not know</td>
<td>84</td>
<td>26.9</td>
</tr>
</tbody>
</table>
Knowledge items (n=312) | Number | %
---|---|---
**Aggravating factors of asthma**
Dust | 246 | 78.8
Smoke (including cigarette smoking) | 244 | 78.2
Changes in weather | 224 | 71.8
Common cold | 213 | 68.3
Insecticides | 213 | 68.3
Exhaustion | 160 | 51.3
Psychological | 148 | 47.4
Muscular exercise | 125 | 40.1
Food | 73 | 23.4
**Symptoms of asthma**
Shortness of breath (dyspnea) | 265 | 84.9
Chest tightness | 239 | 76.6
Cough | 210 | 67.3
Wheeze | 180 | 57.7
**Symptoms of severe attack of asthma**
Severe shortness of breath | 285 | 91.3
Severe persistent cough | 232 | 74.4
Inability to walk or talk | 213 | 68.3
Inability to play | 208 | 66.7
Persist for 1-3 hours after treatment | 151 | 48.4
Bluish discoloration of lips and nails | 142 | 45.5
**Complications of asthma**
Sleep disturbances | 198 | 63.5
Respiratory failure | 156 | 50
Affects child’s growth and development | 143 | 45.8
Thoracic cage deformities | 127 | 40.7
Sudden death | 79 | 25.3
**Sources of asthma information**
Pediatrician | 138 | 44.2
General/Family physician | 56 | 18
Nurses | 40 | 12.8
Relatives/Friends | 21 | 6.7
Health educator | 20 | 6.4
Television | 14 | 4.5
Social media | 13 | 4.2
Written health materials | 10 | 3.2

Table 4 showed parental behaviours during and between asthmatic attacks. The majority of parents (88.5%) gave their children the necessary medications during the attacks. About two thirds rest the child, gave soft fluids, and made massage to the child (70.5%, 67.6%, and 62.8% respectively). Also, most parents gave their children regular medications and removed the aggravating factors as dust to prevent asthmatic attacks (82.7% and 81.1%), however, the least behaviour was performing regular breathing exercises (45.5%).

| Behaviors (n=312) | Number | %
---|---|---
**During asthmatic attacks**
Give the child the necessary medications | 276 | 88.5
Resting the child and reduce the movement | 220 | 70.5
Give water, juice, or herbal fluid | 211 | 67.6
Make massage to the child’s chest or back | 196 | 62.8
Ask for help | 182 | 58.3
Let the child cough to get rid the mucus | 163 | 52.2
Give the child breathing exercises | 139 | 44.6
Wait and see the progress of wheezes | 126 | 40.4
**Prevention of asthmatic attacks**
Regular use of asthma medications | 258 | 82.7
Cleaning the house to remove dust | 253 | 81.1
Remove the aggravating factors as smoking | 249 | 79.8
Let the child relax | 228 | 73.1
Treat common cold attacks | 226 | 72.4
Prevent severe exhaustion | 214 | 68.6
Prevent severe exercise | 182 | 58.3
Let the child cough to remove mucus from the lung | 172 | 55.1
Regular practicing of breathing exercises | 142 | 45.5

**Discussion**

Asthma is one of the common respiratory problems facing paediatricians in their daily work worldwide. If inadequately treated, it can disturb children’s quality of life in addition to the direct and indirect economic burden on the country. Asthma can be resolved with time, and most children become free of the disease toward adult life depending on the provision of qualified care and adherence to treatment plan. Thus, adequate parental information about protective and therapeutic strategies is very important to prevent further attacks or to make them milder.
The socio-demographic characteristics of the study sample revealed that around two thirds of children (60.6%) were males, 51.6% were aged ≤5 years of age, 42% had family history of asthma, and three quarters (75%) of them were living in urban areas. Similarly, Alsamarai et al. (7) and Aljanabi et al. (10) demonstrated that most of asthmatic children were males (52% in Tikrit and 67.7% in Baghdad respectively), and 68.4% in Saudi Arabia, but most of Saudi patients (61%) were aging ≥ 5 years (11). Another national study by Jallab and Hasan found that family history of asthma was present in 52% (12), and other researchers explored comparable results of residency as Alsamarai et al. (7) and Al-Kubaisi et al. (13) with proportions of 75% and 80% respectively living in urban areas.

Most of parents in the present study were educated (76.6% for mothers and 81.4% for fathers), and around half of them (47.4%) were living in middle social class. Parallel results were demonstrated by several researchers as in Baghdad where 60.7% of mothers and 77.3% of fathers were educated and the complementary proportions were either illiterate or write only (13). In North Carolina 76% (14), and in Riyadh 85.3% of parents/guardian were educated, the latter study showed that 48% of participants lived in middle income level (11). These trivial differences in the socio-demographic characteristics between the current and other studies are expected in the light of socio-economic variations between different localities and at variable times.

More than half of parents in the present study had various misconceptions and believes about the treatment of their children, for example, 68.9% said that it is better not use inhalers for long time, 65.4% preferred to use inhaler directly, 63.8% believed that medications should be used during asthmatic attacks only, 50.3% thought that inhalers can lead to addiction, and 46.5% assumed that inhalers can affect the heart adversely. Similarly, several researches concerned with parental myths and believes were conducted at different localities such as in Riyadh where 67.5% of parents afraid from addiction effects of steroids on their children (16). Although all are Arabic areas, there are differences in the proportions of parental thoughts and believes depending on their cultural and educational backgrounds.

It is clear that most parents are more aware about the aggravating factors than the pathophysiology of asthma (17). In this study, there was a relatively moderate knowledge about the mechanism of asthma where > 56% declared that asthma is caused by either inflammatory bronchial obstruction or bronchial narrowing; and only 26.9% did not know the exact mechanism. The reverse condition was observed by Al-Binali et al. (18) in Aseer where the majority of mothers (84.4%) did not know the mechanism whereas 85.3% of parents in Riyadh agreed that airway inflammation is the main cause of asthma (11). These variations may be due to the differences in those providing information whether only mothers or both parents.

Many parents in the present study knew several aggravating factors such as dust, smoke, changes in weather, common cold etc. and the least familiarity was about the role of food (78.8%, 78.2%, 71.8%, 68.3%, and 23.4% respectively). Similarly, common cold and weather changes were the main factors and food was among the least risk factors of asthma verified by Al-Binali et al. (18) in Aseer. Whereas Dharmage and Perret (1) demonstrated dust and food as the main allergic and weather changes, exercise, and smoke as the main non-allergic triggering factors of asthma among children. These differences are expected depending on the most prevailing risk factors in each community.

The majority of parents in the current study recognized dyspnoea and chest tightness as the main symptoms of asthma (84.9% and 76.6%), while severe dyspnoea and persistent cough as the main features of severe asthma (91.3% and 74.4%). The least knowledge was about bluish discoloration of lips and nails or peripheral cyanosis (45.5%). In Khartoum, 85% of mothers explored cough and dyspnoea as the main symptoms of asthma (19), while dyspnoea, wheezing, chest tightness, and persistent cough were the main symptoms exhibited by elementary school teachers (20).

The most important complications predicted by parents in the present study were sleep disturbances (63.5%) and respiratory failure (50%). The least knowledge was about sudden death as a sequel of severe
disease (25.3%). Conversely, 77.4% of parents in Riyadh (11) and 70% of mothers in Khartoum thought that asthma can lead to death if it is severe (19). This variability may be explained as fear of parents in the current study from exhibiting death as a possible outcome of severe asthma in their kids.

Fortunately, most parents in this study received their information from several sources, but depending on their 1st answer the greater proportion said that they acquire their information from paediatricians followed by general or family physicians (44.2% and 18% respectively) just similar to information sources of caregivers in Riyadh (11).

Parental commitment with the management program is vital in controlling and preventing asthmatic attacks among their children. In the present study, most parents provided their children the necessary medications during attacks in addition to resting the children and giving them soft drinks (88.5%, 70.5%, and 67.6% respectively). The least therapeutic behaviours were making breath exercises and watching the progress of wheezes (44.6% and 40.4%). The same was demonstrated by AlOtaibi and AlAteeq (11), Albarraq (17), and Al-Binaliet al. (18) where giving medications, making massage to child’s chest, and giving homemade remedies were the main actions taken by caregivers to children during asthmatic attacks in Saudi Arabia.

On the other hand, most parents in the current study adopted several activities to prevent attacks like the regular use of medications, remove dusts and other aggravating factors …etc. (82.7%, 81.1%, and 79.8% respectively), the minimum parental practice was making regular breathing exercises for their children (45.5%). These are similar to parental practices documented by AlOtaibi and AlAteeq (11) and Al-Binaliet al. (18) researches, whereas breathing exercises was the least implemented preventive behaviour explored by Albarraq study (17). Other studies recognized limitation of child’s movement and prevention of sports as preventive strategies for childhood asthma (20,21) although practicing sports and exercises by children with controlled asthma can improve their physical capability, general health, and even can prevent asthma exacerbation. Thus, improving caregivers’ knowledge and behaviours is essential to enhance their children’s health and provide proper quality of life.

Conclusion and Recommendation

This research revealed that the best parental knowledge was in the aggravating factors and symptoms of asthma and the least ones were about the mechanism and complications of asthma, whereas the best behaviour was the regular use of medications and the worst was practicing breathing exercises. Thus, additional education about asthma is recommended to improve parental information and enrich their children’s healthy outcome.

Conflicts of Interest: None.

Financial Funding: Self-supported.

References


Detection of Parvovirus B19 in B-thalassemia Major Patients by Serological and Molecular Method

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Abstract

Introduction: Because to the tropism of human parvovirus B19 to erythroid progenitor cells, infection in patients with an underlying hemolytic disorder such as Beta thalassemia major leads to suppression of erythropoiesis, referred to as reticulocytopenia, which could be life threatening. The aim of the study was to determine the rate of occurrence of parvovirus (B19) in beta thalassemia major patient by using real time-PCR, Study the correlation between B19 virus and patient’s descriptive data and the correlation between B19 viral load and IgG titer.

Method: This case-control study was done to detect the presence of parvovirus B19 DNA in plasma samples and anti-IgG ELISA of patients with beta thalassemia major. The population consisted of 75 patients with beta-thalassemia major who attended the Aban Al-balady hospital in in the City of Baghdad and 75 healthy people as a control.

Results: The prevalence of parvovirus B19 in our study population was 28 (37.3%) were positive for B19 DNA by quantitative polymerase chain reaction in which highly significant different P value (< 0.0001), Results of enzyme linked immunosorbet assays showed that IgG antibodies was positive in 16 (21.3%) compared with control group which was 7 (9.3%). According to statistical analysis the difference was in borderline between case and control group in prevalence of B19 virus. There was significant (P= 0.039) association correlation between B19 DNA and anti-IgG positivity, but were significant in WBC (P<0.0001).

Conclusion: In study, B19 infections were discovered in patients with beta thalassemia major. Screening of such risky groups will significantly reduce the incidence and prevalence of B19 infection.

Keywords: Parvovirus B19; Thalassemia; PCR, ELISA, Iraqi patients.

Introduction

Human parvovirus B19 (HPVB19) is a tiny single strand DNA virus. It is the only member of Parvoviridae family, genus Erythrovirus, known to be pathogenic to human(1).

After success access to the human host, Parvovirus B19 targets the erythroid progenitors in the bone marrow by binding to the glycosphingolipid globoside (Gb4), also recognized as blood group P antigen (2). It’s generally harmless in healthy individuals but may have a serious clinical effect in susceptible recipients such as patients with shortened red cell survival such as Sickle cell disease and BTM patients, immunocompromised patients and pregnant woman(3). HPVB19 virus may cause more severe disease, like transient aplastic crisis in patients’ suffering from chronic hemolytic disorders(4). This virus is resistant to most physicochemical factors and is mainly transmitted through respiratory secretions; however, it can be transmitted through blood and blood products(5).
The main clinical features of infection with parvovirus B19 include dermatologic manifestation, rheumatologic findings and hematologic effect\(^6\). The illness association with human parvovirus B19 evolves differently in different individuals. Some may be asymptomatic and other develop only prodromal symptoms. In some, the prodromal illness is followed by a later phase of more definable symptoms. In a few, particularly those who immunosuppressed or suffering from related illnesses which put them at high risk, the disease may become chronic and complicated with long term sequelae. In outbreak, asymptomatic infection occur in \(~20\%\) of children and adults expose to the virus\(^7\).

Beta Thalassemia major, owing to chronic hemolytic diseases with shortened half-life of RBC, are at higher risk of acquiring aplastic crisis after exposure to this virus, sudden worsening of anemia, reticulocytopenia and cessation of erythropoiesis of the bone morrow are characteristic feature of transient aplastic crisis\(^8\).

HPV B19 had a strong tropism for hemopoitic stem cell, the virus integrates in a specific site in human genome. The infected cell fail to divide, impairing the production of new RBC, reticulocytecount usually fall to as low as 0.1 to 0.5% from routine values of 6-20% in patient with hemolytic anemia disorder\(^9\).

HPV B19 infect mature erythroid progenitor, preventing further replication and maturation, the more primitive precursor are affected minimally\(^10\). There are several studies about the seroprevelance of the virus with thalassemia patients which include Kishore study in India by ELISA (IgG) that appeared 73 (81%) from 90\(^{11}\). Arabzadehstudy in Iran (Tehran) that resulted 4% from 70 by real-time PCR\(^{12}\) Mohamed study in Egypt (Fayoum) by ELISA (IgG) that presented 18.2% from 55\(^{13}\) Same 23 Tarish study in Iraq (Babylon) by ELISA (IgG) that resulted 30.4% from 46\(^{14}\).

This study was aimed to detect the occurrence of Parvovirus (B19) in Iraqi thalassemia major patients by real-time-PCR and IgG titer and Study the correlation between B19 virus and patient’s descriptive data.

**Material And Method**

This descriptive cross-sectional study was performed on 150 person, among them 75 patient with beta thalassemia major and 75 apparently healthy persons that served as control group. All patient were attended the Aban AL-balidy hospital (hereditary blood disorders center) Baghdad/Iraq during period from December 2018 to May 2019. All these individual were diagnosed as case of thalassemia major by HPLC and all relevant information was obtained from all cases using special questionnaire.

Five millimeters of venous blood were aspirated from all subjects included in the study. Blood sample divided in tow tubes, one of whole blood was collected in EDTA blood tube to get plasma for molecular part and other were allowed to clot and then centrifuged for 15 min at 3000 rpm in order to collect serum. Serum kept deeply in frozen (-20) unless worked immediately for evolution of different parameter.

HPVB19 was detected by immunological and molecular method.

In Immunological Method, Anti-HPV B19 IgG was done by using ELISA test kit (MyBioSource/ Germany). The test was done according to manufactures instructions.

In molecular method,HPVB19 DNA was extracted using a commercial genomic DNA extraction kit (Geneaid, Taiwan).

Virus copy number was for B19 determine by real-time PCR using TaqMan master mix as follows:

Pre-treatment (50°C, 2 min, 1 cycle), Initial denaturation (95°C, 10 min, 1 cycle) and annealing and extension (95 °C, 15 sec, 45 cycles) and using commercial kit (Sacace)/Italy).

SPSS version 21 was used to perform the data analysis and to calculate the descriptive statistics. Chi-Square and Fisher Exact test were used to determine the statistical significance of level of differences between patient (case) control group according to Anti-HPVB19 IgM and IgG. P value <0.05 was considered to be significant.

**Results**

The real-time PCR detection of B19 DNA revealed 28 (37.3%) positive and 47 (62.7%) negative samples out of 75 subjects and 3 (4%) positive and 72 (96%) negative samples out of 75 healthy persons as shown in Table (1). there was significant different P value (< 0.0001). Odds ratio indicate that patients with BTM had 14.3 the ability to get the infection rather than the control.
Table (1) Results of Real-time-PCR for study group and control.

<table>
<thead>
<tr>
<th></th>
<th>Case</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Negative qRT-PCR</td>
<td>Positive qRT-PCR</td>
<td>Total</td>
</tr>
<tr>
<td>Count</td>
<td>47</td>
<td>28</td>
<td>75</td>
</tr>
<tr>
<td>% within Case</td>
<td>62.7%</td>
<td>37.3%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% within Real_time_PCR</td>
<td>39.5%</td>
<td>90.3%</td>
<td>50.0%</td>
</tr>
</tbody>
</table>

Chi-sq: P< 0.0001 (highly significant)/Odds ratio= 14.3

Ig G prevalence of B19 virus among participants:
The overall distribution of B19 IgG antibodies among study and control groups were shown in table (2). The highest seropositivity was noticed among study group (cases) was 16 (21.3%) compared with control group which was 7 (9.3%). According to statistical analysis the difference were in borderline between case and control group in prevalence of B19 virus. The result also indicate that thalassemia patients had 2.63 increasing in the B19 IgG antibodies than the healthy.

Table (2): Frequency of B19 virus among participants.

<table>
<thead>
<tr>
<th></th>
<th>Case</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Negative B19 IgG</td>
<td>Positive B19 IgG</td>
<td>Total</td>
</tr>
<tr>
<td>Count</td>
<td>59</td>
<td>16</td>
<td>75</td>
</tr>
<tr>
<td>% within case</td>
<td>78.7%</td>
<td>21.3%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% within Parvo_B19_IgG</td>
<td>46.5%</td>
<td>69.6%</td>
<td>50.0%</td>
</tr>
</tbody>
</table>

Chi-sq: P= 0.06 (borderline significant)
Odds ratio=2.63, P=0.04
Association between RBC count and B19 virus by PCR) in thalassemia patients: The result showed that in BTM patients 26 (40%) were found to be positive by qRT-PCR PV19 and had low RBC count and 2 (20%) had normal RBC count. 15 (23.1%) patients were found to be positive by ELISA with low RBC count and 1 (10.0%) patients were found to be normal count. There were no significant P value as shown in figure (1) and figure (2).

**Figure (1) Association between RBC count and B19 virus (by PCR) in thalassemia patients.**

**Figure (2) Association between RBC count and B19 virus (by ELISA) in thalassemia patients.**
Detection of WBC level within Thalassemia -B19 positive by qRT-PCR: Table (3) show the effect of viral infection detected by qRT-PCR on the WBC level in thalassemia patients, the result indicted the following: No patient had leukopenia, 26(92.9%) had leukocytosis and finally 2(7.1%) with Normal leukocyte number. In Thalassemia -B19 negative the results were 36 (76.6%) had normal leukocyte number, 9(19.1%) with leukocytosis and 2(4.3%) had leukopenia. these difference were significantly important.

<table>
<thead>
<tr>
<th></th>
<th>Negative B19 DNA</th>
<th>Positive B19 DNA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leukopenia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>% within WBC_status</td>
<td>100.0%</td>
<td>.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% within Real_time_PCR</td>
<td>4.3%</td>
<td>.0%</td>
<td>2.7%</td>
</tr>
<tr>
<td><strong>Normal leukocyte number</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>36</td>
<td>2</td>
<td>38</td>
</tr>
<tr>
<td>% within WBC_status</td>
<td>94.7%</td>
<td>5.3%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% within Real_time_PCR</td>
<td>76.7%</td>
<td>7.1%</td>
<td>50.7%</td>
</tr>
<tr>
<td><strong>Leukocytosis</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>9</td>
<td>26</td>
<td>35</td>
</tr>
<tr>
<td>% within WBC_status</td>
<td>25.7%</td>
<td>74.3%</td>
<td>100.0%</td>
</tr>
<tr>
<td>% within Real_time_PCR</td>
<td>19.1%</td>
<td>92.9%</td>
<td>46.7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Count</td>
<td>47</td>
<td>28</td>
<td>75</td>
</tr>
<tr>
<td>% within WBC_status</td>
<td>62.7%</td>
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<td>100.0%</td>
</tr>
<tr>
<td>% within Real_time_PCR</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Frequency of WBC level within Thalassemia -B19 IgG positive patients: From the sixteen thalassemia patients positive by ELISA, 11(68.6%) had leukocytosis, 4(25%) normal leukocyte number and only one (6.2%) with leukopenia. while in negative Thalassemia patients, 34(57.6%) with normal leukocyte number, 24(40.7%) with leukocytosis and only one (1.7%) with leukopenia.

Discussion

Patients with BTM are at higher risk of acquiring aplastic crisis, sudden worsening of anemia, reticulocytopenia and cessation of erythropoiesis of the bone marrow (transient aplastic crisis) after exposure to parvovirus B19 infection\(^{(15)}\).

The present study revealed a high prevalence of the viruses in the thalassemia major patients 37% (28/75) when compared with study done in Iran by Nikoozad Et al\(^{(16)}\), in this study the rate was 20% (6/30). the difference may be due to the sample size of the. A small sample size will not provide a precise and reliable estimation of the prevalence and a larger sample size is needed to obtain a higher confidence level.

Also, our results differ from study done in Hong
Kong(17) a Thailand (5) but agree with Heegaard ET.al.(18).

Seroepidemiologic studies of several countries showed that prevalence of parvovirus B19 infection varied among countries and populations(19). Our results was lower than a study done in Babylon city/Iraq. Their result was 30.4% positive for Anti-B19 IgG(14), But result is in same rang with that reported by Fayoum study/Egypt(13) of 55 beta thalassemia major patient (Anti-B19 IgG is 18.2%).

Results obtained by Siritantkorn et al.(5) from Thailand, of 60 thalassemic major patient (Anti-B19 IgG is 38%).More or less similar rates were found by a study done in USA on patients with sickle cell disease; it showed that 30% had evidence of old PB19 infection at first testing(20).

The difference perhaps related to geographical variation in prevalence of HPVB19 infection(19).

Chronic parvovirus B19 infection was demonstrated by the presence of parvovirus B19 DNA and anti-parvovirus B19 IgG in patients’ plasma, while lacking of anti-parvovirus B19 IgM. Thalassemic patients who had parvovirus B19 DNA in their blood plasma but had no anti-parvovirus B19 IgG might be in an early phase of acute parvovirus B19 infection (21).In This search, a total of ((28)) patients were tested positive for B19 infection by using PCR and ((16)) by using ELISA techniques. The discrepancies between DNA and IgG findings refer that searching for specific IgG is a cheap and easy diagnostic tool for basic screening; but the sensitivity of the test may be very low in selected groups of objected. It is advisable that if IgG turns out to be negative, to continue searching for possible B19 infection by employing. About RBC count in this study revealed to 26 from 28 of BTM infected with B19 DNA had low RBC count and 2 were normal count this due to beta thalassemia major anemia that result from the absent synthesis of beta globin chains, leading to excess alpha chains. B-thalassemia generally presents as severe form of the disease because it produces severe anemia in their homozygous and compound heterozygous states(22). In present study apperead result Leukocytosis in BTM infected with PB19 DNA (74.3%) and anti PB19 IgG (31.4%), properly due mix infection with unknown bacteria that may be encourage PB19 infection also the Leukocytosis can use as a sign of infection with PB19.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

Reference


Prevalence and Clinical Features of Ocular Adenoviral Infection among Patients Attended to Ibn-Alhaitham Teaching Eye Hospital in Baghdad, Iraq: A Molecular Study

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¹Lecturer/University of Anbar/Medical College, Department of Surgery/Iraq, ²Assist Prof./University of Anbar/Medical College, Medical Microbiology Department/Iraq, ³Assist Prof./College of Medicine, University of Fallujah/Iraq

Abstract

Background: Viral conjunctivitis is commonly caused by adenoviruses, with a rate of up to 40% of all viral causes.

Objective: To show prevalence and clinical features of ocular adenoviral infection at Ibn-Alhaitham teaching eye hospital in Baghdad, Iraq.

Patients and Method: In this cross-sectional study, eye swab samples were taken from 638 patients with clinically diagnosed infectious conjunctivitis during the period from August 2019 to February 2020. Samples were processed and tested using polymerase chain reaction (PCR) to detect adenoviral infection.

Results: Of 638 patients with infectious conjunctivitis attended to the Ibn Al-Haitham teaching ophthalmic hospital in Baghdad, 113 cases (17.7%) were confirmed to having ocular adenoviral infection with the mean age 27±8.4 years and The highest percentage of those affected in the age group 1-10-year-old (31.9%). Sixty-three were male (55.8%) and 50 were females (44.2%). non-statistically significant difference between unilateral & bilateral involvement. Of total 113 patients with ocular adenoviral infection, 50 (44.2%) patients experienced flu-like illness during or before their ocular complaint, 85 (75.2%), 28 (24.8%) showed conjunctival follicular reaction and conjunctival membrane formation respectively. Only four (3.5%) patients showed no corneal changes during their ocular infection, 39 (34.5%) patients showed mild punctate epithelial keratitis, 54 (47.8%) patients showed significant punctate epithelial keratitis and 16 (14.2 %) patients showed anterior stromal infiltrate. 64 (56.6%) patients developed lymphadenopathy.

During follow up, 13 (11.5%) of patients fully recovered within less than 14 days, 69 (61%) patients recovered in 2-4 weeks whereas 31 (27.4%) patients took longer than 4 weeks for a full recovery.

Conclusion: Results have demonstrated that adenoviruses are common causative agents for infectious conjunctivitis. PCR revealed to be more sensitive and accurate for detecting adenoviral ocular infection.

Keywords: Ocular adenoviral infection, Prevalence, clinical features, Baghdad, Iraq.

Introduction

Adenoviral ocular contagion is mainly caused by different strains of ocular adenovirus(1)(2). Conjunctivitis due to adenovirus is the world’s most common cause of red eye(3).

One of the studies at the Wells Hospital showed that conjunctivitis due to adenovirus constitutes approximately 62% of cases of clinically diagnosed infectious conjunctiva in the emergency room and this is supported by previous studies that confirm that 15
to 70% of conjunctivitis is due to this virus\(^\text{(1,3)}\). There are approximately 50 adenovirus serotypes, distributed into six groups\(^\text{(2,4,5)}\). Certain serotypes of adenovirus are associated with certain eye diseases\(^\text{(1,2)}\). The most public types of viral conjunctivitis are "epidemic-keratoconjunctivitis" (EKC) in addition to "febrile pharyngoconjunctivitis" & non-specific "follicular conjunctivitis\(^\text{(1,6)}\). EKC is frequently linked with "adenovirus serotypes" 8, 19 & 37\(^\text{(2,4,6,7,8)}\). EKC is considered as a more predominant form of "adenoviral-keratoconjunctivitis" owing to the adversarial magnitudes it might have on visual acuity\(^\text{(8)}\).

The epidemiological capacity of the adenovirus conjunctivitis has contributed to the emergence of many infections with this virus in hospitals and health care site\(^\text{(9,10,11)}\). The infection may appear in crowded places, such as schools, markets and hospitals\(^\text{(1,9)}\). The method of transmission of this virus may be through direct contact through eye secretions and the respiratory system, or by indirect means, such as dirty, contaminated tools\(^\text{(11)}\). Adenovirus may remain on non-bone surfaces for a month and is ready to cause infection through surfaces such as door handles and other surfaces\(^\text{(4,9)}\). Many people infected with adenoviruses are without clinical symptoms and this represents a major problem that contributes to the spread of the virus\(^\text{(9)}\). Ophthalmologists may unintentionally contribute to spreading the adenovirus from infected individuals who do not show clinical signs to uninfected people\(^\text{(9)}\). There is no appropriate guideline treatment plan for treating viral adenoviral conjunctivitis\(^\text{(5)}\). The spread of the adenovirus is very fast more than expected\(^\text{(9,12)}\).

**Patients and Method**

This descriptive study was conducted for a period from August 2019 to February 2020 in "Ibn Al-Haitham teaching eye hospital" in Baghdad. 638 patients with a clinical diagnosis of infectious conjunctivitis were randomly selected. Infectious conjunctivitis(conjunctival hyperemia, discharge, pain and burning) was diagnosed by an experienced ophthalmologist. Having filled the written informed consent, specimens had been scraped from "lower-palpebral conjunctiva"using cotton swab & collected by different transport media (2 ml) for PCR (distilled water). The tubes transport media had been storage at 4°C & conveyed on "cold- bag" to laboratory where they had been storage at"-70°C" till used.

Ethical approval had been obtained from Anbar medical college, Ethics Approval Committee Iraq.

**Molecular study:** The phenol chloroform method was used to purify the DNA from the eye sample and the following forward and reverse primers were used to amplify the gene for adenoviruses.

ADRJC1 "(5-GAC-ATG-ACT-TTC-GAG-G TC-GAT-CCC-ATG-GA-3)"

ADRJC-2 (3-ATG-G AC-GCG-TGG-GGA- AGA-GT C-G GC-C-5)"

"Thermal cycler"had been programmed for 1\(^\text{ST}\) initial cycle of 94°C one min, 55°C for one min & 72°C for 1min (Repeated 40 cycles). The PCR products had been "electrophoresed on a 2% "agarose gel" that contain "Ethidium bromide stain".The PCR product of unaffected eyes scraping had been used as a negative control. The bands had been visualized through ultraviolet Trans illuminator. "PCR product " had been analyzed through comparison with positive control.

Data examination had been done through using of t-test & chi-square in SPSS software (version 24, SPSS Inc., USA).

**Results**

Out of 638 patients with infectious conjunctivitis, 113 (17.7%) patients were confirmed as having an ocular adenoviral infection. Sixty-three patients were male (55.8%) and 50 patients were females (44.2%) giving a male/female ratio 1:1.1.

The range of age was from 1 year to > = 41 years. The mean age was (27±8.4 years). Most of the patients with ocular adenoviral infection presented in age group 1 – 10 year old (31.9%) followed by 11 – 20-year-old (19.5%), 19.5% were also in > = 41 years old age group, & 16.8% were in 31-40-years old age group, while remaining 12.4% were in the age group 21-30-year-old as shown in Table 1.

The study showed that 50 patients (44.2%) with ocular adenoviral infection experienced flu-like illness before or during their ocular complaint and 63 patients (55.8%) with ocular adenoviral infection didn’t have any systemic manifestation (Table 1).
Table 1. Socio-demographic characteristics and flu-like illness appearance of ocular adenoviral infected patients

<table>
<thead>
<tr>
<th>Character</th>
<th>No.(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>27±8.4</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>63(55.8%)</td>
</tr>
<tr>
<td>Female</td>
<td>50(44.2%)</td>
</tr>
<tr>
<td>Age group (Years)</td>
<td></td>
</tr>
<tr>
<td>1-10</td>
<td>36 (31.9)</td>
</tr>
<tr>
<td>11-20</td>
<td>22 (19.5)</td>
</tr>
<tr>
<td>&gt; = 41</td>
<td>22 (19.5)</td>
</tr>
<tr>
<td>31-40</td>
<td>19 (16.8)</td>
</tr>
<tr>
<td>21-30</td>
<td>14 (12.4)</td>
</tr>
<tr>
<td>Flu-like illness</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>50 (44.2%)</td>
</tr>
<tr>
<td>No</td>
<td>63 (55.8%)</td>
</tr>
</tbody>
</table>

Regarding the laterality, the study showed that 56(49.6%) patients with ocular adenoviral infection had unilateral ocular involvement while the other 57 (50.4) patients with ocular adenoviral infection had bilateral ocular involvement. "Non-statistically significant difference" between unilateral & bilateral ocular adenoviral infection (Table 2).

Regarding the distribution of conjunctival reaction of confirmed ocular adenoviral infection, the study showed that 85 patients (75.2%) had conjunctival follicular reaction, while only 28 (24.8%) patients showed conjunctival membrane formation in addition to conjunctival follicular reaction (Table 2).

Of 113 patients having an ocular adenoviral infection, only four (3.5%) patients showed no corneal changes during their ocular infection, 39 (34.5%) patients showed mild punctate epithelial keratitis, 54 (47.8%) patients showed significant punctate epithelial keratitis and 16 (14.2 %) patients showed anterior stromal infiltrate (Table 2).

Of the total 113 patients with ocular adenoviral infection, 64 (56.6%) patients developed lymphadenopathy (mostly preauricular, less commonly retro auricular and submandibular) during their illness, while 49 (43.4%) patients did not develop any lymphadenopathy (Table 2).

Table 2. Clinical findings of ocular adenoviral infections

<table>
<thead>
<tr>
<th>Character</th>
<th>No. of patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laterality</td>
<td></td>
</tr>
<tr>
<td>Unilateral</td>
<td>56 (49.6%)</td>
</tr>
<tr>
<td>Bilateral</td>
<td>57 (50.4%)</td>
</tr>
<tr>
<td>Associated keratopathy</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>4 (3.5%)</td>
</tr>
<tr>
<td>Mild punctate epitheliopathy</td>
<td>39 (34.5%)</td>
</tr>
<tr>
<td>Significant punctate Epitheliopathy</td>
<td>54 (47.8%)</td>
</tr>
<tr>
<td>Anterior stromal infiltrate</td>
<td>16 (14.2%)</td>
</tr>
<tr>
<td>Conjunctival findings</td>
<td></td>
</tr>
<tr>
<td>Follicular reaction</td>
<td>85 (75.2%)</td>
</tr>
<tr>
<td>Conjunctival membrane</td>
<td>28 (24.8%)</td>
</tr>
<tr>
<td>Lymphadenopathy</td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>64 (56.6%)</td>
</tr>
<tr>
<td>Absent</td>
<td>49 (43.4%)</td>
</tr>
</tbody>
</table>

There was a statistically significant correlation between the Conjunctival reaction and corneal findings of ocular adenoviral infected patients (P-Value 0.000) as shown in Table 3, Figure 1.
Table 3. Relationship between Conjunctival reaction and corneal findings in patients with ocular adenoviral infection

<table>
<thead>
<tr>
<th>Conjunctiva</th>
<th>No keratopathy</th>
<th>Mild punctate epitheliopathy</th>
<th>Significant punctate epithelial keratitis</th>
<th>Ant stromal infiltrate</th>
<th>Total</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follicular reaction</td>
<td>4 (4.7%)</td>
<td>36 (42.4%)</td>
<td>39 (45.9%)</td>
<td>6 (7.1%)</td>
<td>85(100.0%)</td>
<td>0.000</td>
</tr>
<tr>
<td>Membrane</td>
<td>0 (0.0%)</td>
<td>3 (10.7%)</td>
<td>15 (53.6%)</td>
<td>10 (35.7%)</td>
<td>28(100.0%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4 (3.5%)</td>
<td>39 (34.5%)</td>
<td>54 (47.8%)</td>
<td>16 (14.2%)</td>
<td>113(100.0%)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Relationship between Conjunctival reaction and corneal findings in patients with ocular adenoviral infection

There was no statistically significant between the Laterality and Keratopathy of ocular adenoviral infected patients (P-Value 0.742) as shown in figure 2.
Regarding the duration for full recovery in ocular adenoviral infection during follow up, the study showed that 13 (11.5%) patients fully recovered in less than 14 days, 69 (61%) patients recovered within 2-4 weeks whereas 31 (27.4%) patients took longer than 4 weeks for a full recovery.

Figure 2. Correlation between Laterality and Keratopathy in patients with ocular adenoviral infection

Figure 3. Duration of recovery of patients with ocular adenoviral infection
Discussions

Conjunctivitis is the most prominent eye disease where there are many viruses associated with this disease, the most important of which are (enterovirus 70 (EV70), Coxsackie A24 virus (vCA24), in addition to Denver and the last one of the most common causes of acute conjunctivitis)(12,13).

The main symptoms of ocular adenoidal surface infection that are linked with a prominent "inflammatory reaction" are red of eye, irritation, tearfulness of the eye, edema, follicular conjunctivitis, edema of the conjunctiva, hyperemia of eye, "epithelial keratitis", & most frequently the appearance of "lympho-adenopathy"(6). The adenoviral ocular infection might be fast and clinical symptoms appear only after a week of infection, which represents the incubation period(14). Mostly, the other eye may be affected by the infection within a days later, but to a much lesser degree(15). Communicability time extended from the late incubation-14 days after onset disease (16).

Studies in Japan have shown that adenovirus constitutes almost 90% of viral conjunctivitis cases. However, conjunctivitis can be due to a virus, which is mostly adenovirus, bacteria, or allergies(17) whereas, However, adenoviral conjunctivitis represents 15-75% of all cases in the world(17,18). In our study, we found that the prevalence of adenoviral ocular infection is 17.7%. The infection with adenoviruses is not related to a particular season, but it is aware of an infection rate that occurs during the summer as a result of the movement of society due to social activities such as swimming and day camps(19). Another cofactor of infection with these viruses that cause viral adenoviral conjunctivitis in urban areas is poor sanitation, in addition to overpopulation.

The discovery of a polymerase chain reaction (PCR) made it easy to use this test in the analysis of tear samples from the lower body floor in a melodramatic form, in which this test is possible to know the viral pathogen directly instead of virus isolation and this helps to reduce the prevalence of viral conjunctivitis, especially adenoviral conjunctivitis Viral where ancient studies showed that it was 18-45%(20,21) of acute conjunctivitis that had no recognizable etiology. The PCR reaction, which represents the most accurate and sensitive test in diagnosing the causes of conjunctivitis, especially viral ones, has given credence to many studies.

Adenovirus induced eye infection is a self-defined disease and yet many patients try to get treatment because of symptoms severity(7). Where treatments of such infections is the use of cold compresses, artificial tears and other comfortable measures(6). Very often antibiotic ointments, ""topical-non-steroidal anti-inflammatory drugs"" (NSAIDs) and corticosteroid ointments are used(4,6). Supportive therapy is necessary due to the lack of real "anti-adenoviral conjunctivitis" treatments(5,7,8).

Conclusion

Adenoviral ocular infection is an important cause of ocular morbidity in Iraq.

PCR is a useful test that help in diagnosis of ocular adenoviral infection, with suitable infection control depending on speedy and precise diagnosis, we can expect a real reduction in the incidence of outbreaks of community-acquired and nosocomial contagious adenoviral conjunctivitis infections.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: Non

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References


Hepatitis B Virus Reactivation in Patients Receiving Chemotherapy and Immunosuppressive Therapy

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Abstract

Hepatitis B virus (HBV) infection is a serious and common infectious disease of the liver, affecting millions of people throughout the world. The incubation period for HBV is 45-180 days, most commonly 60-90 days. Hepatitis B reactivation is the reappearance or rise of hepatitis B virus (HBV) DNA in the serum of patients with past or chronic HBV infection. Reactivation can occur in a variety of clinical settings, usually in the context of an immunosuppressed state or immunosuppressive therapy. The aim of the study is to find out the reasons that lead to reactivation of hepatitis B virus. The study conducted during the period from September 2019 to February 2020, the sample size was 135 individuals, including 85 patients and 50 control with 56.47% female and 43.53% male) blood samples. A 42 (49.41%) from patients have reactivated HBV positive results as detected by ELISA assay. A five samples at a rate of 5.88% from these are HBV reactivation by PCR technique.

Keyword: Hepatitis B virus, Reactivation, Liver function test, ELISA and PCR.

Introduction

Hepatitis B virus (HBV) is a DNA virus belonging to the Hepadnaviridae family, which includes hepatotropic viruses. The HBV virion consists of an external lipoprotein envelope and an internal protein nucleocapsid with icosahedral symmetry, containing the viral genome and the DNA polymerase. The HBV genome is partially double-stranded circular DNA molecule with four partially overlapping open reading frame encoding structural and non-structural viral proteins. It is transmitted through exposure to infectious blood, semen and other body fluids. HBV can be transmitted from infected mothers to infants at the time of birth, or from family members to infants in early childhood. Transmission may also occur through unsafe sexual intercourse, transfusions of HBV-infected blood and blood products, contaminated injections during medical procedures and sharing of needles and syringes among injecting drug users. The infection can be diagnosed 30 to 60 days after exposure; the diagnosis is usually confirmed by testing the blood for parts of the virus and for antibodies against the virus. The incubation period ranges from 45–160 days, with an average of 75 days, followed by an insidious onset of acute disease. HBV reactivation is the reappearance or rise of hepatitis B virus (HBV) DNA in the serum of patients with past or chronic HBV infection. Reactivation can occur in a variety of clinical settings, usually in the context of an immunosuppressed state or immunosuppressive therapy. HBV reactivation has been most commonly reported in patients receiving chemotherapy for hematologic malignancies and following hematopoietic stem cell transplants. An estimated 2 billion people worldwide have serological evidence of either past or present HBV infection, with around 240 million people chronically infected. The prevalence varies globally, ranging between 2% in Europe to over 10% in East Asia; in the UK it is estimated to be between 0.5-1.7%, with areas of greater ethnic diversity such as London having a higher prevalence of approximately 2.4%.

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Reactivation of hepatitis B virus (HBV) is a major problem in patients receiving chemotherapy for malignant diseases or immunosuppression therapies. It has been thought that a reduction in the immune responses might result in the reactivation of HBV replication from covalently closed circular DNA (cccDNA) residing in hepatocytes. However, not only the host’s immune status, but also viral mutations have been reported to be associated with reactivation(7).

Materials and Method

The practical side of this study was conducted during the period from September 2019 to February 2020. One hundred and thirty five (135) samples were collected. Two enrolled groups of subjects were involved in this study. A eighty five (85) blood samples. The Patients were piously diagnosed with suspected liver disease by physician, included (48 females and 37 males) with an age range (14-78 years old) they were diagnosed by serological and molecular test, liver function test (LFT), complete blood count (CBC). Plasma and serum samples taken from every patients and control having thoroughly examined Fifty(50) healthy control. After laboratory tests for patients, only 42 patients were HBV positive by ELISA and PCR, using the primers designed for this study at length 482bp (RE2 5-AACCACTGAACAAATGGCAC-3), five cases appeared to have HBV reactivation.

Results and Dissection

The results of this study were shown in tables (1) and (2) five HBV reactivation risk group by PCR, only one without chemotherapy and immunosuppression therapy (renal failer) but the other four with chemotherapy and immunosuppression therapy, (A cute Leukemia, Kidney Transplantation, Lung cancer and Leukemia) two of them are normal ALT, AST, decrease in PL, and positive HBV, the four other are increase ALT, AST, decrease in PL and positive HBV. All patient are females with different age (52, 15, 40, 71, and 50) years old.

<table>
<thead>
<tr>
<th>Anti-HBc</th>
<th>HBsAg</th>
<th>AST</th>
<th>ALT</th>
<th>Disease/Chemo+immune therapy and Age</th>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>Positive</td>
<td>Normal</td>
<td>Normal</td>
<td>Renal failer/without 52 years</td>
<td>Female</td>
</tr>
<tr>
<td>Positive</td>
<td>Negative</td>
<td>Normal</td>
<td>Normal</td>
<td>Acute Leukemia/with 15 years</td>
<td>Female</td>
</tr>
<tr>
<td>Positive</td>
<td>Negative</td>
<td>Increase</td>
<td>Increase</td>
<td>Kidney Transplantation/with 40 years</td>
<td>Female</td>
</tr>
<tr>
<td>Positive</td>
<td>Negative</td>
<td>Increase</td>
<td>Increase</td>
<td>Lung cancer/with 71 years</td>
<td>Female</td>
</tr>
<tr>
<td>Positive</td>
<td>Negative</td>
<td>Increase</td>
<td>Increase</td>
<td>Leukemia/with 50 years</td>
<td>Female</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Anti-HBc</th>
<th>HBsAg</th>
<th>PL</th>
<th>Disease/Chemo+immune therapy and Age</th>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>Positive</td>
<td>Decrease</td>
<td>Renal failer/without 52 years</td>
<td>Female</td>
</tr>
<tr>
<td>Positive</td>
<td>Negative</td>
<td>Decrease</td>
<td>Acute Leukemia/with 15 years</td>
<td>Female</td>
</tr>
<tr>
<td>Positive</td>
<td>Negative</td>
<td>Decrease</td>
<td>Kidney Transplantation/with 40 years</td>
<td>Female</td>
</tr>
<tr>
<td>Positive</td>
<td>Negative</td>
<td>Decrease</td>
<td>Lung cancer/with 71 years</td>
<td>Female</td>
</tr>
<tr>
<td>Positive</td>
<td>Negative</td>
<td>Decrease</td>
<td>Leukemia/with 50 years</td>
<td>Female</td>
</tr>
</tbody>
</table>

The results explained in tables 1 and 2 indicated that the patient who take chemotherapy and immunosuppression therapy with HBsAg negative and Anti-HBc positive, the patients with renal failure, acute leukemia, kidney transplantation, lung cancer leukemia are in danger (most at risk) of HBV reactivation these results consistent with previous study. Through this study it was found that patient with cancer and who have undergone an organ transplant are more likely to reactive hepatitis B virus.

HBV reactivation generally occurs in some cancer patients after chemotherapy, immunosuppressive therapy and biological modifier therapies(8). especially
when some solid tumors and leukemia patients are using hormones such as prednisolone and rituximab that emerged clinical crisis. It can also occur in some patients with autoimmune diseases, organ transplants (kidney transplants, lung transplants, heart transplants, etc.) and human immunodeficiency virus (HIV), but the most serious cases are often with bone marrow or liver transplants\(^9\). At the same time, drugs such as some tyrosine kinase inhibitors\(^10\), the serum ALT rapidly rose above the upper limit of the baseline. If the serum ALT increases by more than 5 times compared with the upper limit of normal value, which could be called hepatitis burst and if it increases by more than 10 times, it could be called deteriorating acute hepatitis. In the course of HBV reactivation, rise of the serum ALT level can be accompanied by that of HBV DNA level and sometimes the HBV DNA can increase firstly, when the HBV DNA falls back and the serum ALT level rises remarkably. Therefore, the serum ALT levels and HBV DNA levels are often used as important indicators to monitor the risk of HBV reactivation in clinical patients\(^11\).

**Conclusion**

From the present work we can concludes that reactivation of hepatitis B virus (HBV) can be occurred in patients receiving chemotherapy for malignant diseases or immunosuppression drugs. The evidence for such reactivation that the platelets count were decrease while the ALT and AST levels vary and the patient have asymptomatic HBV.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**Funding:** Self-funding

**Reference**

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Microphages Count and Activity, a Comparison Study between Radiotherapy Technicians and other Hospital Occupational

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Abstract

Radiotherapy technicians are classified as radiation occupational with continuous exposure to radiation, radiation can damage human cells including Hematopoietic cells. The present study dealt with estimation of both count and activity of peripheral microphages. A total of (23) hospital occupational were tested using peripheral Microphages count in blood film and phagocytic activity by NBT reduction test. Results showed that Test group G1 (12 technicians) recorded normal ratios of microphages count; but diminished in their activity when compared with control group G2 (11 occupational). Conclusions: there is a great association between radiation exposure dose and Microphage activity even though their counts are within normal range. And that harmful effect can increase due to synergistic effect of poor special PPE supply.

Keywords: Radiotherapy Technicians, radiation Exposure, Microphage, NBT, phagocytosis, WBCs count and PPE.

Introduction

Radiotherapy technicians are classified as persons with continuous exposure to radiation, in other word they are workers in radiation field (radiation occupational), regardless their exposure dose or time. In Iraq, the ministry of health and environment supply them with film badge to record seasonal dose of radiation exposure that they were exposed to. Moreover, a seasonal periodic checkup is applied on them and special records organized for each individual to ensure their safety. But, the management after exposure effects are poor and Biosafty equipment for personal protection (PPE) is missing\(^1\) and \(^2\).

Radiation exposure, in general, affects Microphages (Neutrophils, Basophils and Eosinophils) basically and with increase in time and dose of exposure; the effect may become more severe and may reach bone marrow upon chronic radiation exposure\(^3\).

Microphages are the first line of defense in blood stream, they represent the innate cellular immune defense against any invading microbe and they play a major role during opsonization and complement system activation and that will reflex on specific immune response assimilated by the adaptive immunity\(^4\).

Generally, all hospital workers and employees, regardless of their specification or work type, are in continuous exposure to pathogenic microbes due to their contact with patients. Hence, they need intact immune system to stay stand and response against such active and invasive pathogens in such working environment\(^5\). The present study aimed to estimate cellular innate immunity integrity in hospital occupational blood including radiotherapy technicians by evaluating the radiation effects on several parameters used.

Method and Materials

Subjects: Present study included (23) healthy volunteers, all were occupational in the Institute and
Hospital of Radiotherapy and Nuclear Medicine in Baghdad, adults of both genders, non-smokers, with no clinical symptoms of any disease, their ages ranged (49-25) with a mean (32) years. Volunteers were divided into two groups; G1: Test group included (12) Radiotherapy administration Technicians and G2: control group included (11) occupational (physicians, laboratory Technicians, directory employees and others not related to radiation exposure during work).

Samples: A total of five mL of fresh blood were collected from all subjects involved in this study, heparinized tubes were used in collection as recommended by (6) to maintain the viability and activity of microphages in collected blood samples until applying tests.

Peripheral Microphages count: Blood film technique was used in peripheral microphages counting according to (6), whereas a small drop of heparinized blood sample was used to prepare a smear for each subject’s sample and stained with Leishman’s stain (Fluka, Germany). Percentages for microphages were counted using Microscope oil immersion.

Microphages Activity Detection: Activity of peripheral Microphages was detected depending on the technique of NBT test; Nitro-Blue Tetrazolium reduction test, toxic dye was supplied by (Sigma, USA). Whereas, the participated blue Formazan particles were considered as positive result. This test was accomplished according to (3).

Statistical Analysis: Calculation of means for percentages obtained in the present study was done. Values of both counting and activity detection outcomes for both G1 and G2 were used. Then (Microsoft Word 2010 chart tool) was used to compare results.

Results
All results for G2 (control group) were found normal and accepted. Concerning peripheral microphages count; despite of the decreased values obtained for G1; the values were also accepted and within normal values, ranged (56-70%) with a mean value (63%).

While; microphage activity results for G1 showed an obvious drooping. Ratios of positive or active microphages ranged (35-64%) with a mean value (54%). Fig (1). While finding of G2 values were all normal or within normal accepted range.

Fig (1): Microphages Activity and Count Results for G1 and G2.
Discussion

Microphages are important cells in defense against any invading microbe, these cells represented by (Neutrophils, Basophils and Eosinophils) are the innate cellular defenders in human peripheral blood, and they are stand by to migrate towered any infected area in the body to eliminate infection before spreading. Phagocytosis, complement activation and opsonization are the most important processes that needed to start an immune response non-specifically to overcome any infection\(^4\).

Concerning radiation field occupational, White blood cells count (WBCs count) is one of the routine tests during the periodic checkup that applied seasonally on the radiation occupational\(^1\). But, microphages activity estimation is not included in these tests. Hence, this study dealt with detection of microphages count and activity in technicians whom in continuous exposure to radiation during work. The present study subjects included technicians that responsible of administration of radiotherapy for patients need such therapy. And due to poor management and lack of special PPE supply for those technicians; this study was accomplished to determine the effects of radiation exposure during these circumstances on the parameters included in the present study.

The outcome of microphages count showed a slight decrease in these cells ratios when compared with normal dependent range recommended by \(^5\) and the obtained percentages of G2 group (control group). Despite of the fact that the members of G2 groups were hospital occupational, but they were with no history of radiation exposure during work. These findings are supported by a similar investigation accomplished by \(^7\), they found that life style like smoking and poor sleep affect WBCs count rather than other factors estimated in workers blood. Another local study done by \(^8\), they found that the results of blood WBCs total and differential count were within normal for workers occupied in maternal and labor hospital in Karbala city and that is in agreement with the results of the present research.

Regarding microphages activity, the results revealed an obvious suppression in cells activity to reduce the NBT dye used in this test. When microphages are active and viable; they will phagocytose NBT dye and reduce it, then form the dark blue Formazan dye particles which precipitate inside the phagolysosome of microphages and cells then considered as NBT positive. The phagocytic cells consume respiratory oxidative burst to reduce this toxic dye, hence it is considered as one of the most important tests for viability estimation\(^5\).

The present study showed that radiotherapy administration technicians suffered from decreased positive Microphages for NBT test, meaning despite of the normal count of Microphages in their peripheral blood, their activity for complete phagocytosis process were diminished obviously by disability to reduce the toxic dye used in activity detection test. That can due to radiation continuous exposure which can crack microphage from the inside, even when they are still alive; they are no more active.

That opinion is depended on \(^9\), radiation exposure can accumulate inside living cells including hematopoietic cells causing inside damage and if this damage is not reparable, epically in blood cells precursors; the new cells will get the same damage. USNRC Technical Training Center\(^9\) recommended ALARA principle to overcome this problem, meaning As Low As Reasonably Achievable, avoid accumulation of radiation dose and give time for cells to repair damage is the best way to avoid such harmful consequences due to occupation exposure to radiation\(^9\).

Another study done by \(^10\), reported similar results on radiation exposure during work and decreased phagocytic activity of Neutrophils. Also the research of \(^3\) proved that irradiation can suppress neutrophils activity leading to lose function. Another consent findings were published by \(^11\) and supported the same opinion above.

Conclusions

The present study outcomes revealed that there is a great association between radiation exposure dose and Microphage activity even though their counts are within normal range. And that harmful effect can increase due to synergistic effect of poor special PPE supply.

Acknowledgment: I am grateful to the occupational in the Institute and Hospital of Radiotherapy and Nuclear Medicine in Baghdad whom donated their blood samples.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

Funding: Self-funding
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Alternative Preservatives of a “Nisin A” with Silver Nanoparticles for Bacteria Isolation from the Local Food Markets of Baghdad City

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Abstract

Today technology using nanoparticle when treatment pathogenic microorganism and we focused on this here. It was found that the species of *Staphylococcus epidermidis* used in present study were sensitive to Levofloxacin. The aim of report effect (Nisin-Silver Nanoparticles) on ability of complete healing injury comparing using Nisin only . In vivo study revealed that silver nanoparticles treatment of *S. epidermidis* contaminated injured skin showed good healing process contain complete regeneration of the epithelial cells of the epidermis and good prognosis and increase of cellularity of the dermal content compared with untreated group. In conclusion, treatment of skin infected with *S.epidermidis* using silver nanoparticles at different concentration may limited the skin damage, localized the lesion to the incision site and enhance the healing process.

**Keywords:** *Staphylococcus epidermidis*, Nisin A, silver nanoparticles.

Introduction

The process of contamination of foods leading to loss of color, texture and their nutritive value and permits growth of pathogenic microbes, which deteriorates the quality of the product and makes it. Food contamination can occur with its exposure to the environment while slaughtering, food processing and packaging.(1)

Conventional food packaging aims at shelf life extension, maintenance of quality and assurance of safety of the food product. However, now a days foods ecurity is a big issue and, therefore, antimicrobial packaging system is specifically designed to control the microorganisms that adversely affect the above three goals.(2)

Antimicrobial agents have different activities on different pathogenic microorganisms due to their various diverse physiologies.(3) Silver nanoparticles (AgNPs), have strong permeability and effective broad-spectrum antibacterial properties and it used to produce a range of antibacterial therapeutic products, such as, toothpaste, gynecologic suppository and wound dressing.(4)

Thus, there is a need for “green chemistry” that comprises a clean, nontoxic and environmentally-friendly manner of nanoparticles synthesis, an alternative to conventional techniques, biological method are considered ecologically sound for the nanomaterials fabrication and safe.(5)(6)

Nisin A is a bacteriocin formed by Lactobacillus lactis. It is the most bacteriocin studied and assort as the generally recognized as safe (GRAS) in 1988 by the FDA according to low toxicity to human body (US Food and Drug Administration, 1988). It is embedded to lantibiotic class kind a liner with small amino acid peptide chain (34 amino acid residues).(7)

Bacteriocins are antimicrobial peptidesproduce
by certain bacterial strains, which are immune to them, to compete by preventing the growth of other bacteria existing in their environment. Nisin is a 35-mer bacteriocin of the lantibiotics group, whose use as a food preservative was approved by the Joint Food and Agriculture Organization.

Many reports on antibiotic extensively subclass of bacteriocins, which includes (staphylococcin C55 and NisinA) amongst others, Several type highly activity anti- clinically relevant and food-borne pathogens.

Material and Method

Media Preparation

Ready to Use Media: “The media were prepared according to instructions of the manufacturer. They were brought to boil in water to dissolve all constituents completely, then the pH was adjusted to 7.2 and sterilized by autoclaving at 121°C (15 Ib/In²) for 15min. They were incubated at 37°C for (18- 24) hrs to sterilization.”

Samples Collection: A total of 40 food samples were purchased from local markets Baghdad/Iraq October 2018 to January starting from 2019 (type of samples are: Cake without cream, Cake with cream; Arab Cheese; Kemar Arab; Raw milk (no. of samples 8 per each type to give total samples are 40)). The samples were taken after recording the labeling information (commercial name of product), then putting it in the ice box and transport to the microbiology laboratory to isolate pathogen bacteria on the same day.

Cultivation of Bacteria: Each samples put 10g or 10 ml according to type of sample then diluted in 90ml sterile enrichment peptone water and incubated at 37°C for (18- 24)hrs. Then loopful of incubated culture was cultured on were cultured first on Mannitol salt agar and MacConkey agar plates to differentiated between Gve + and Gve- bacteria.

Biochemical Analysis: The morphology and biochemical tests were conducted according to the method described by Bergey’s manual of determinative bacteriology.

Antimicrobial susceptibility testing: Bacteria gram positive and negative were detected by antibiotic disk in DDM. This method was implemented subsequently the instructions of the clinical and Laboratory Standards Institute.

Molecular assay:

DNA extraction: Genomic DNA was extracted from the detected bacterial isolates according to the protocol of Wizard Genomic DNA Purification Kit, Promega. Quantaas Fluorometer was used to detect the concentration of extracted DNA.

Well Diffusion Method: (WDA) Well diffusion method Jérôme et al., (2014) then 100 μL of the suspension was spread on the test plate (Muller Hinton Agar). And put (10 μL) of the essential oils and placed on well in agar. Plates were incubated at 37°C for 24 hours and the zone of inhibition was measured. The experiment was performed in triplicate and the average diameter of inhibition was calculated.

Preparation of Nisin A stock solution: Nisin A Figure (3-4) (Sigma Nisaplin 2/5%) was prepared by dissolving with 100mg from Nisin A powder in 10 ml HCl (0.02 N) to provide 10⁴ IU/ml (40 IU=1 g) concentration. After that the solution was passed through 0.45 filters for sterilization and was maintained at –20°C.

Preparation of Bio Extract: Fresh peel 20 gm of Lemon leaves were washed with tap water and then washed with distilled water, air dried a little and then they were finely cut and soaked in 100 ml boiling distilled water for 5-10 minutes and filtered through Whatman filter paper no. 42. This extract was used for generating Silver Nano particles.

Preparation of 1mM Silver Nitrate: Silver nitrate was brought from Lobachemie. Weigh 0.0169gm of silver nitrate and dissolve in 100mL of distilled water in amber coloured bottle.

Synthesis of Silver Nanoparticles: 3mL of prepared extract was added to 40mL of silver nitrate solution in 100mL conical flask contain lemon peel extraction Incubate at room temperature for 2- 3 hours. Control is made containing only 40 mL of silver nitrate solution. Show Figure (1)

Scanning Electron Microscope (SEM Analysis): The morphological features of synthesized silver nanoparticles from neem plant extract were studied by Scanning Electron Microscope (JSM-6480 LV). After 24Hrs. of the addition of AgNO3 the SEM slides were prepared by making a smear of the solutions on slides. A thin layer of platinum was coated to make the samples conductive. Then the samples were characterized in the SEM at an accelerating voltage of 20 KV.
Antibiotic Sensitivity Test: For inoculums, standard homogenized *Staphylococcus epidermidis* was prepared in normal saline and the suspending was diluted to $0.5 \times 10^8$ CFU ml compared with McFarland tubes.\(^{(10)}\)

Antibiotic sensitivity test for *S. epidermidis* was done by Kirby-Bauer disk diffusion method against OxacillinOX (1), Erythromycin E (15), Levofloxacin LEV (5), Cloxacillin, CX (1), Cefepime, FEP (30). The zone of inhibition were measured (mm) and compared with pretive chart a documented standard, the zone of inhibition (in mm) Clinical and Laboratory Standards Institute\(^{(16)}\).

Primers Selection: The set of primers 27F (AGAGTTTGATCTTGGCTCAG) and 1492R(TACGGTTACCTTGTTACGACTT) was used for amplification of 16s rRNA for identification of bacteria at gene level.\(^{(17)}\)

Preparation of Silver Nitrate: Silver nitrate was brought from Lobachemie. Weigh 0.0169gm of silver nitrate and dissolve in 100 ml of distilled water to obtain three concentration (25, 50 and 75mM) in ambercolored bottle.

Characterization of Silver Nanoparticles: Then synthesis of silver nanoparticles was checked in UV-Visible spectroscopy at the wavelength of 300 - 700nm.

Synthesis and optimization of Nisin-Silver nanoparticles compounds: Fifty mM of AgNO\(_3\) solution was prepared and different concentrations of Nisin Making double serial dilutions (16,32 and 64 µg/ml) in collection beaker (10 ml) to 50 mM silver nitrate solution after that was mixed with continuous stirring slowly.

Synthesis of AgNO\(_3\) at Room temperature: The solution above mentioned are incubated at 37°C (Room temperature) for 27hrs and observed the change color and checking every one day. UV-V is spectra using for the solution to monitored and measured then the flask was incubation at room temperature for another two days until the completion of the reaction.

Bacteriocin Nisin A: Bacterocin was preparation from a commercial (Nisin A obtained from Cayman Chemical Company) asaccording to\(^{(18)}\) at concentration (31.25, 62.50 and 125µg/ml).

Agar Well Diffusion Assay (AWD): Efficiency different concentration of Nisin A measurement activity was carried out by serial two-fold dilutions method by AWD.

Result and Discussion

Isolation Bacteria: The symptomatic cases are shown in Table (1), were out of 40 food samples 35(60%) isolates were identified as *S. aureus* gave positive and *E. coli* isolates reached 22. The highest percentage of isolates was present in raw milk then in cheese and cake with cream reached to respectively.
Table (1): Prevalence of Bacterial isolates from food samples.

<table>
<thead>
<tr>
<th>Sample</th>
<th>No. Sample</th>
<th>S. aureus %</th>
<th>E. coli %</th>
<th>Klebsiella spp %</th>
<th>Enterobacter %</th>
<th>Staphylococcus % epidermidis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw milk</td>
<td>8</td>
<td>35 (43)</td>
<td>22 (32)</td>
<td>16 (27.5)</td>
<td>12 (31.5)</td>
<td>9 (30)</td>
</tr>
<tr>
<td>Kemar Arab</td>
<td>8</td>
<td>15 (18.5)</td>
<td>19 (27.9)</td>
<td>16 (27.5)</td>
<td>9 (23.6)</td>
<td>8 (26.6)</td>
</tr>
<tr>
<td>Arab Cheese</td>
<td>8</td>
<td>17 (20.9)</td>
<td>15 (22)</td>
<td>11 (18.9)</td>
<td>10 (26)</td>
<td>7 (23)</td>
</tr>
<tr>
<td>Cake without cream</td>
<td>8</td>
<td>8 (9.8)</td>
<td>9 (13)</td>
<td>7 (12)</td>
<td>4 (10.5)</td>
<td>4 (13)</td>
</tr>
<tr>
<td>Cake with cream</td>
<td>8</td>
<td>6 (9.8)</td>
<td>3 (4.4)</td>
<td>8 (13.7)</td>
<td>3 (7.8)</td>
<td>2 (6.6)</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>81 (81)</td>
<td>68 (68)</td>
<td>58 (58)</td>
<td>38 (38)</td>
<td>30 (30)</td>
</tr>
<tr>
<td>Chi-Square (P-value)</td>
<td>---</td>
<td>9.935 **</td>
<td>9.173 **</td>
<td>6.004 **</td>
<td>8.469 **</td>
<td>8.931 **</td>
</tr>
</tbody>
</table>

** (P<0.01).

Various levels susceptibilities to different antibiotics among isolates that were observed by Disk diffusion method isolates was multi-resistance for antibiotics with a high level against, Oxacillin, Cefoxitin, Erythromycin. But sensitivity to Levofloxacin this result was similar to that acquired by.(19)

Staphylococcus spp. count in the samples was low and all the strains were considered as coagulase-negative strains on coagulase-test. S. aureus is considered as the most important foodborne pathogen of this group and it is considered as coagulase-positive specie. Based on such results according to.(20)

Isolation and identification of Bacteria:

Isolation and Identification of Gram positive:
(Staphylococcus. epidermidis and Staphylococcus. aureus)

The macroscopic examination of isolates on Mannitol Salt Agar have an ability to ferment mannitol and turn the color of medium from red to yellow were classified as a presumptive S. aureus and S. epidermidis isolates

The isolates on Blood agar showed yellow-gray colonies are (4-3) mm in diameter on the zones of β-hemolysis

Isolation and Identification of Gram Negative:
The macroscopic examination of presumptive (E. coli, P. aeruginosa, Klebsiella spp and Enterobacter pp). (Figure 2).

Figure (2): Bacterial isolation from Food sample on MacConkey and Eosin methicillin blue agar mediums at 24hrs at 27°C.
Were found to be (*E. coli, P. aeruginosa, Enterococcus faecalis* and *K. pneumoniae*) resistant to between (92.7-96.5 %) but moderately resistant to other between (70.5-67.2 %). Show the *E. coli* isolates β-lactam resistance is probably due to the production of (TEM β-lactamases), which may be the chromosome or on a plasmid genetically localized on. this result was similar to that obtained by(21). Showes most isolates of *Staphylococcus aureus* were multi-resistance for antibiotics with a high level against Methicillin, Penicillin G, Cefoxitin, Erythromycin, Oxacillin, Chloramphenicol and Tetracyclin. But sensitivity to Azitromycin.(22) In this study, the genomic DNA of bacterial isolate was successfully extracted and the extracted DNA has an appropriate quality to perform PCR (10 ng/µl). 16S rDNA (Fig. 3).

Study of Nisin-Silver Nanoparticles compounds characterization:

- **Spectral Properties of the Nisin-Silver Nanoparticles**

  A strong surface plasmon centered around 340 nm.

**Atomic Force Electron Microscopy (AFM):**

The AFM micrograph obtained for the Nisin-silver nanoparticles Figure (4) For the sample the roughness value was 56 nm and the section analysis of the sample’s grain size value was 42 nm.

**Figure (4). AFM for nisin-silver nanoparticles**

**Transmission Electron Microscopy analysis (TEM) of silver nanoparticles:**

**Figure 5: TEM of A) S. epidermidis before treatment Nisin-Silver Nanoparticles B) Enterobacter sp after treatment Nisin-Silver Nanoparticles**
The well diffusion agar method (WDA) was used to detection *S. epidermidis* sensitivity to word Nisin-Silver Nanoparticles. The concentration (31, 62 and 124) µg/ml was appeared the inhibition zone size is (11 and 9) mm respectively while at 125µg/ml not any inhibition, the result agree with(23). The previous study by(23) showed that Nisin A was active against MRSA and *Staphylococcus epidermidis* less than other strain in MIC range 2mg/l at 24 hrs. Many studies have regarded the activity of Nisin for use as antimicrobial therapeutic(24).

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**Funding:** Self-funding

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Immunological Study of Some Pathogenic Bacteria Isolated from Patients with Chronic Kidney Failure

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Abstract

Renal failure is one of kidney diseases in which the kidney work in less than 15% of normal, the chronic kidney failure may develop slowly and its irreversible. Many bacterial infection can associate with kidney failure due to low immunity and insufficient kidney infiltration. This study was aimed to investigate the immunological parameters in kidney failure patients. Sixty patients with chronic renal failure reviewed to one hemodialysis center was evaluated, 50 samples with bacterial infection and 10 samples without bacteria in diuresis. The results show significant decease in IgA, IgM, IgG concentrations for patients with bacterial infection 15.24 pg/ml 60.52, 29.9, in compared with uninfected patients which show 59.1, 33.8, 18.3 pg/ml, the IgE was increased due to the presence of bacteria by 206.6pg/ml. comparing with 186.04 pg/mL in uninfected patients,also IL-1β increased significantly 72.74 pg/ml compared with controls 5.38 pg/ml and a significant decrease in complement C3 in the presence of bacteria at a concentration of 112.45 pg/ml compared with concentration of 155.4 pg/ml in healthy people. This study conclude that the immunological parameters different significantly in patients with chronic kidney failure infected with different bacterial infection in compared with uninfected patients.

Keywords: Chronic kidney failure, immunoglobulins,IL-1β,complement system

Introduction

That chronic kidney failure (Renal failure) is a deterioration in the excretory secretory function of the kidney as a result of accumulation of nitrogenous waste and harmful substances produced by various metabolic reactions¹,² as they are unable to remove the final metabolic products from the blood, which leads to a disturbance in the value balance pH and balance of bodily fluids³. Chronic kidney failure is a common disease in the modern era, especially in cases of simultaneous infection with multiple bacterial infections, where E. coli bacteria are the most common and cause urinary tract infection in patients with kidney failure followed by bacteria Others⁴. People with kidney failure have an acute systemic immunity deficiency that is responsible for around 20-30% of deaths of patients with kidney failure and those who continue with hemodialysis⁵ that may cause failure Renal to an increase in inflammatory responses, which includes a number of mechanisms that include the reaction of the immune system, which is an increase in the concentration of Proinflammatory Interleukins.⁶ Interleukins act as inflammatory indicators that stimulate or inhibit immune response cells, as the production of Interleukins is considered as a primary response of the mucous layer when Bacterial invasion, where the concentration of interleukin increases when infection occurs⁷. Most of these bacterial factors may weaken the systemic immunity of patients with chronic renal failure.

The study was aimed to Identification of some pathogenic bacteria accompanying patients with chronic renal failure from clinical samples. Study of some immunological indicators, include measurement of immunoglobulins IgG IgM, IgA, IgE and complement C3 and IL- 1β.
Materials and Method of work: 110 blood and diarrhea samples were collected at the same time from chronic kidney failure patients attending the Kidney Dialysis Unit at Ramadi General Teaching Hospital in Anbar Governorate for the period from October 2018 to August 2019 and 60 samples were divided into 50 blood and urine samples containing bacteria and 10 samples Blood and urine do not contain bacteria. The ages of patients ranged between (15-85) years and of both sexes. Also, 24 control samples were collected.

After collecting blood samples, the serum was separated in a tube by centrifugation at a speed of 3,000 rpm for 10 minutes and then the tests were done. The test was based on the Sandwich-ELISA method to conduct the examination where a specialized antibody dish was installed on the surface of the microprocessing plate, which is particularly associated with standard solutions or With serum when added to the microplate pits then washed with distilled water and read on the ELISA device with a wavelength of 450 nm.

Results

The isolation results showed 50 urine samples with positive growth of bacterial culture out of 110 samples collected from patients with chronic renal failure. The results showed that 50 samples gave bacterial growth (for both negative and positive bacteria) as in figure (1) the number of negative bacteria was (68%)The number of positive bacteria (32%).

The level of concentrations of the final rates in the measurement of immunoglobulins for patients with chronic kidney failure in the presence of bacteria when compared with patients with chronic kidney failure without bacteria and healthy people, the level of IgG in the patient sample decreased kidney failure in the presence of bacteria and the absence of bacteria compared to a sample Control. The decrease in the presence of bacteria was higher than 15.24 pg/ml, when bacteria were not found pg/ml 18.3 Comparing them with healthy subjects pg/ml 39.0. A similar decrease occurred in the serum IgM level in the patient sample with the presence of bacteria pg/ml 60.52 and lack of it pg/ml. 59.1 compared to the control sample 81.83 pg/ml and provides for a decrease in the level of Both IgG and IgM in patients with renal failure,
Table 1: Levels of concentrations of immunoassay among patients with chronic renal failure without bacteria and with bacteria and healthy subjects

<table>
<thead>
<tr>
<th>Studied totals Immunohistochemical replications</th>
<th>Healthy people</th>
<th>Bacterial patients</th>
<th>Patients without bacteria</th>
<th>L.S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IgG</td>
<td>39.0</td>
<td>15.24</td>
<td>18.3</td>
<td>0.012**</td>
</tr>
<tr>
<td>IgM</td>
<td>81.83</td>
<td>60.52</td>
<td>59.1</td>
<td>0.064**</td>
</tr>
<tr>
<td>IgA</td>
<td>43.62</td>
<td>29.9</td>
<td>33.8</td>
<td>0.079**</td>
</tr>
<tr>
<td>IgE</td>
<td>123.37</td>
<td>186.04</td>
<td>206.6</td>
<td>0.278**</td>
</tr>
<tr>
<td>IL-1β</td>
<td>36.64</td>
<td>72.74</td>
<td>57.43</td>
<td>4.79 **</td>
</tr>
<tr>
<td>Complement C3</td>
<td>147.38</td>
<td>112.45</td>
<td>155.4</td>
<td>6.48 **</td>
</tr>
</tbody>
</table>

As for the concentration of IgA shown in Table (1), it was found that its serum concentration levels in patients with kidney failure in the presence of bacteria pg/ml 29.9 and its absence 33.8 pg/ml decreased compared to pg/ml 43.62 in the control sample. The results showed a high concentration of immunoglobulin IgE for chronic renal failure patients as shown in table (1) with bacteria 186.04 pg/ml and lack of it 206.6 pg/ml compared to healthy subjects 123.37 pg/ml where high levels of IgE in the blood were considered an indication of the disease.

Whereas, bacterial infections stimulate macrophages cells to release inflammatory media such as 1β IL-1 (18), as the results shown in Table (1) show the complement concentrations of Complement C3, an increase in patients with chronic renal failure without bacteria 155.4 pg/ml and a decrease in the presence of bacteria. 112.45 pg/ml compared to healthy subjects 147.38 pg/ml,

Discussion

The lack of growth in negative samples of bacterial culture may be attributed to the fact that the cause may be viral or from anaerobic bacteria that cannot be isolated by the usual culture method used in this study Or due to patients taking doses of antibiotics, or perhaps inappropriate use of the antibiotics that cause the disappearance of bacteria that cause urinary tract infection. The cause of the spread of negative bacteria more than positive bacteria is due to the presence of lipid polysaccharide (LPS), the main component of the outer membrane of bacteria that is negative for Gram stain. LPS helps protect bacterial cells from their surroundings (8).

The reason for the decrease in the level of immunoglobulins for patients with chronic kidney failure may be due to several reasons, including accumulated uremic toxins, which inhibit the manufacture of immunoglobulins in patients with chronic kidney failure and a decrease in the numbers of B cells B-cell, which is considered the basis for the manufacture of clopiolines in the serum of patients with chronic renal failure by inhibiting their recycling (11) and it can be known if the previous infection in the body through IgG antibodies and a recent infection through antibody type IgM (12). IgA due to decreased immunoglobulin synthesis in these patients which resulted from the patient’s malnutrition status As a result of his deterioration A decrease in IgA causes frequent infections in the urinary system, as this non-inflammatory antibody specializes in protecting the mucous membrane. Whereas, the prevalence of IgA deficiency in a uremic patient may be due to the neutralization of IgA antibodies and previous destruction leading to a decrease in the number of cells B and IgA Secreting B in a uremic patient as the decrease of this antagonist by the presence of bacteria was one of the main causes of death and disease in kidney patients, usually This is explained by the negative effects of the uremia on the immune defense, for both humoral and cellular immunity and the specific antibody response was low (13). If an increase in the concentration of clopiolines is demonstrated by the presence of bacteria in the response of the intestinal immune system to bacterial colonization by acquiring a state of a deficiency response in the blood defense process against reproductive and active readiness against pathogens, this dialogue leads to the production of large amounts of IgA (14).

The total IgE level in the blood was found to be
clinically relevant in nephrotic syndrome and this is consistent with(15), it showed that the serum IgE level was significantly higher in the renal group compared to the control group. IgE to increased risk of hypersensitivity, resulting from dialysis in patients with chronic renal failure with itching (16). The results of the current study shown in Table (1-1) showed a significant increase in the concentration of interleukin IL-bata in patients with kidney failure. Chronic presence of bacteria is higher than the absence of bacteria in patients. Chronic kidney failure and comparison with the control sample, as patients with kidney failure with bacteria reached 72.74 pg/ml. Also we note there is a rise in patients with chronic kidney failure not having bacteria pg/ml 57.43 compared to the control group 5.58 pg/ml and explained that immunodeficiency in renal failure patients is conservative. The changes in immune-dependent antibodies, as a result of these changes the proportion of immune stimuli such as interleukin and my increase in patients with renal failure to increase excretion and lack of exit from the kidneys. The lack of antibody production is a reflection of the deficiency of T-lymphocyte function(17). The reason for the high concentration in this interleukin is due to the fact that it is from the IL-1β group, as the pro-inflammatory cytokine kinases increase their production rates during cases of immunopathy and infections. And different infections. Renin in the kidneys can lead to supplemental activation. It is an effect that prevents the use of eiskirine. Because renin concentrations are higher in the renal tissues, this may explain the renal tendency of complementary diseases in the presence of complementary mutations or autoantibodies(18). These results are consistent with the researcher’s findings(19) and his group, which indicated a decrease in complement protein C3 in patients with chronic renal failure. Comparing it with the healthy people, the reason for the decrease in the complement protein in bacteria may be due to several reasons(20) including the higher loss of the complement parts by urinary tract method, an increase in its consumption of immune reactions in the circulatory system or by mucous surfaces and interference with the complement-anti-complementary substance. And the activation taking place In the complement system of patients with chronic renal failure by complications and a decrease in immune production(21).

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

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Assessment of Some Inflammatory Biomarkers in Children with Febrile Seizure and Bacterial Meningitis

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Abstract

Introduction: Bacterial meningitis (BM) is a serious infection characterized by inflammation of the meninges, causing a high rate of acute complications in children. This research aimed to explain the effect of procalcitonin (PCT) in BM and its correlation with the others some inflammatory biomarkers.

Method: The case-control study included Fifty children who were diagnosed with suspected bacterial meningitis associated with febrile seizure according to the clinical investigation by specialized pediatrician and analysis of CSF and Forty children were enrolled as healthy control. The inflammatory biomarkers procalcitonin, Erythrocyte sedimentation rate (ESR), C-reactive protein (CRP) were estimated for each participants in addition to measurement of CBC(complete blood count) by using an automated instrument.

Results: Patients have significantly higher serum levels of PRO, CRP, ESR, total WBC count, ANC, and NLR than the control group. Elevating serum PRO and CRP levels in patients group were significantly associated with increased serum ANC levels. A significant relationship was also observed between PRO and NLR, indicating that the PRO, CRP and NLR had a suitable biomarkers in the diagnosis of BM.

Conclusion: Serum procalcitonin is more specific and sensitive inflammatory biomarkers than the NLR and CRP for the evaluation of suspected bacterial meningitis, so the recommended to use PCT assays in the early diagnosis of children with BM.

Keywords: Bacterial meningitis; biomarkers; Health; inflammatory.

Introduction

Bacterial meningitis (BM) is a serious infectious disease characterized by inflammation of the meninges, producing a high rate of morbidity and mortality in children[1]. BM could be deadly for about half of untreated cases. Even with early diagnosis and adequate treatment, more than 15% of the patients die, especially within 1-2 days of starting symptoms.[1] Furthermore, 10– 20% of the survivors are susceptible for persistent sequelae, including CNS damage, hearing loss and difficulties in learning[1]. Three primary organisms account for more than 90% of the cases of meningitis globally, which are S. pneumoniae, N. meningitides and H. influenzae type b[2].

Bacterial meningitis remains a source of mortality and morbidity in spite of new and effective antibiotics use, whereas aseptic meningitis generally has a benign course requiring only supportive care [3] Early diagnosis of BM and its differentiation from aseptic meningitis should be made to terminate the needful for antibiotic use and hospital admissions[4].
Cerebrospinal fluid (CSF) assay is a preferable for predicting of BM, together with inflammatory biomarkers such as CRP and WBC count. Furthermore, it provide enough specificity without giving a good sensitivity for the diagnosis of BM\(^5\). Also, CSF analysis requires considerable time to prepare its results and most children with CSF pleocytosis are treated with powerful antibiotics in the hospital before the CSF culture results was obtained.\(^6\) Besides atypical history, no distinctive physical examination and irresolute and low yield CSF cultures on some occasions, Sometimes CSF parameters cannot differentiate between bacterial and aseptic meningitis\(^7\) while CRP and WBC count can discriminate between bacterial and nonbacterial meningitis\(^8\). Procalcitinin (PCT) is the best candidate to supersede CRP due to its high diagnostic accuracy in different infectious pathologies, including meningitis\(^9\). Procalcitinin (PCT) is a procalcitinin peptid, is produced in C-cells of the thyroid gland in physiological conditions and released from WBC on the peripheral circulation in bacterial infections.\(^10,11\).

This study aimed to determine the diagnostic ability and using of PCT for estimating of BM and its correlation with the studied some inflammatory biomarkers (e.g., C-reactive protein, ESR, total WBC count, neutrophil/lymphocyte ratio) which are required to predict the presence of BM ifLP is contraindicated or difficult to be performed.

**Method**

The case control study was conducted from September 2018 to March 2019, at the Children Welfare Hospital, Medical City, Baghdad, Iraq. The Ethics approved the research of the University of Baghdad, Faculty of Pharmacy IEC (UBCP-RECA-562018). The information about the patients was gained from the parents of each child for study participation and undergoing the assigned investigations. Ninety children aged between 6 months to 5 years, age – sex-matched children were included in the study. Fifty of them were diagnosed with suspected bacterial meningitis according to the clinical investigation by specialized pediatrician and analysis of CSF. Forty children were enrolled as healthy control. The clinical diagnostic criteria of bacterial meningitis included fever (>38 \(^\circ\)C) with signs of meningeal irritation, bulging fontanels, unexplained irritability, disturbed level of consciousness with or without heat, complex febrile seizure, lethargy and various skin manifestations such as petechial or an erythema\(^12\).

Every child who presented with suspected meningitis underwent lumbar puncture by pediatric specialist or resident in the absence of any contra indications, to obtain CSF for Gram stain and culture, which is the most important step in the diagnosis of BM.

The samples of CSF were evaluated for simple cell analysis (pleocytosis with neutrophilia), an elevated protein, reduced concentration of CSF glucose and CSF culture for Streptococcus pneumonia, Neisseria meningitides, Haemophilus influenza. Furthermore, Blood samples were collected from each patient and healthy controls included in the study and divided into two parts, one was put in EDTA tubes for at once CBC(complete blood count) estimation using autoanalyzer instrument (Celltac-G, Nihon Kohden/ Japan) which included measurement of WBC count, absolute neutrophil count(ANC), absolute lymphocyte count (ALC) and lymphocyte counts and hemoglobin (Hb). Also, ESR was measured by using automated instruments (Vistal X20, Siemens/Italy).

The other part was allowed to clot. It centrifuged at 3500-4000 rpm for 10 minutes to obtain serum then set over pyrogen-free Eppendorf tubes to measure C-Reactive Protein) CRP by heterogeneous enzymatic immunoassay (Vitro 950 analyzer, USA), It is a latex agglutination test for qualitative examination of CRP in serum. Also frozen serum sample at - 20°C was kept until assayed of PCT using ready to use human PCT ELISA kit supplied by Mybiosource (MBS760892/USA).

The normal CSF analysis included WBC counts below 8 cells/mm3, glucose levels at (60- 80)% of the serum glucose level and protein levels between 16- 46 g/L. Abnormal CSF results were classified as bacterial profile (elevated cell count with a prevalence of neutrophil, increased protein levels and decrease glucose levels).

**Statistical analysis:** it was performed by SPSS-21. Independent t-test and one-way ANOVA were used to assess the differences between means. The receiver operation characteristic curve (ROC curve) was used to identify the validity of markers as an indicator of disease. The markers were compared according to area under curve. The analysis was performed by using MedCalc Software. \(P \leq 0.05\) is considered significant.
Results

Laboratory and demographic characteristics of patients with bacterial meningitis and control groups are listed in Table 1. Lumbar puncture was done for all patients and the results of CSF analysis include: polymorph nuclear cell (PMN cell/mm$^3$) 44.96±110.13, protein levels (g/l) 70.16±44.66, glucose levels (mg/dl) 53.16±17.94. In addition to the positive CSF cultures for patients with bacterial meningitis (15 cases of N. meningitides, 18 cases of S. pneumonia, 10 cases of H. influenza and 7 cases of E.coli). These results with clinical investigations were used as diagnostic criteria for the identification of bacterial meningitis.

Children with bacterial meningitis have significantly higher serum levels of PRO, CRP, ESR and NLR than the control group.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Control No. 40</th>
<th>Patients No. 50</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex (male vs female)</td>
<td>28:12</td>
<td>40:10</td>
<td>0.96</td>
</tr>
<tr>
<td>Age (months)</td>
<td>33.60±18.41</td>
<td>33.55±15.28</td>
<td>&lt;0.0001**</td>
</tr>
<tr>
<td>Body Temperature (°C)</td>
<td>36.98±0.23</td>
<td>38.37±0.36</td>
<td>&lt;0.0001**</td>
</tr>
<tr>
<td>Hb (g/dl)</td>
<td>11.05±1.62</td>
<td>10.35±1.19</td>
<td>0.02*</td>
</tr>
<tr>
<td>WBC (*10$^3$/µl)</td>
<td>6630.00±1450.76</td>
<td>13408.80±6356.48</td>
<td>&lt;0.0001**</td>
</tr>
<tr>
<td>ANC (*10$^3$/µl)</td>
<td>3583.00±1130.14</td>
<td>5122.89±4077.34</td>
<td>0.01*</td>
</tr>
<tr>
<td>ALC (*10$^3$/µl)</td>
<td>1787.50±430.52</td>
<td>2292.90±1530.84</td>
<td>0.03*</td>
</tr>
<tr>
<td>NLR</td>
<td>2.09±0.72</td>
<td>2.56±1.38</td>
<td>0.04*</td>
</tr>
<tr>
<td>ESR (mm/1 hr)</td>
<td>8.60±4.10</td>
<td>31.80±32.71</td>
<td>&lt;0.0001**</td>
</tr>
<tr>
<td>PRO (pg/mL)</td>
<td>395.56±663.59</td>
<td>918.34±633.91</td>
<td>&lt;0.0001**</td>
</tr>
<tr>
<td>CRP (mg/l)</td>
<td>4.32±0.86</td>
<td>11.72±14.49</td>
<td>0.0007*</td>
</tr>
<tr>
<td>RBS (mg/dl)</td>
<td>95.00±8.23</td>
<td>110.86±16.86</td>
<td>&lt;0.0001**</td>
</tr>
</tbody>
</table>

Data was expressed as Mean± Standard Deviation (SD), *statistically significant at p<0.05 or ** statistically highly significant at p-value ≤ 0.01. Hb: Hemoglobin, WBC: White Blood Cell, ANC: Absolute Neutrophil Count, ALC: Absolute Lymphocyte Count, NLR: Neutrophil Lymphocyte Ratio, ESR: Erythrocyte sedimentation rate, CRP: C-Reactive Protein, PRO: Procalcitonin, RBS: Random Blood Sugar.

Data were subjected to Receiver Operation Characteristic curve (ROC curve) to establish the preferable inflammatory biomarkers for estimation of BM in children with febrile seizure [Fig-1]. Curves of ROC studies confirmed that the ANC was a preferable diagnostic marker of bacterial meningitis, followed by PRO and NLR which are highly specific as compare to CRP. The sensitivity, specificity and cut-off point of inflammatory biomarkers for patients with bacterial meningitis were estimated by ROC [Table-2].
Table 2: Area under the curve (AUC), Standard error (SE), Sensitivity, Specificity, cut-off point and 95% confidence intervals (95% CI) of ANC, CRP, NLR and procalcitonin for bacterial meningitis patients.

<table>
<thead>
<tr>
<th>Variable</th>
<th>AUC</th>
<th>SE</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Cut-off point</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANC (*10^3/µ l)</td>
<td>0.902</td>
<td>0.0303</td>
<td>72.00</td>
<td>100.00</td>
<td>&gt;8600</td>
<td>0.821 to 0.955</td>
</tr>
<tr>
<td>CRP (mg/l)</td>
<td>0.729</td>
<td>0.0541</td>
<td>56.00</td>
<td>90.00</td>
<td>&gt;15</td>
<td>0.625 to 0.817</td>
</tr>
<tr>
<td>NLR</td>
<td>0.820</td>
<td>0.0603</td>
<td>52.00</td>
<td>100.00</td>
<td>&gt;2.5</td>
<td>0.512 to 0.720</td>
</tr>
<tr>
<td>Procalcitonin (pg/mL)</td>
<td>0.945</td>
<td>0.0522</td>
<td>85.00</td>
<td>100.00</td>
<td>&gt;5.5</td>
<td>0.642 to 0.831</td>
</tr>
</tbody>
</table>

*Hanley & McNeil, 1982. bBinomial exact

Elevating serum levels of PRO and CRP in patients group were significantly associated with increased serum ANC levels according to the AUC. A significant relationship was also observed between PRO and NLR, indicating that the PRO, CRP and NLR had better biomarkers in the diagnosis of BM table 3.

Table 3: Pairwise comparison of ROC curves according to the AUC.

<table>
<thead>
<tr>
<th>Comparison between parameters</th>
<th>AUC</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANC ~ CRP</td>
<td>0.225</td>
<td>0.0008*</td>
</tr>
<tr>
<td>ANC ~ NLR</td>
<td>0.100</td>
<td>0.0763</td>
</tr>
<tr>
<td>ANC– Procalcitonin</td>
<td>0.276</td>
<td>0.0001*</td>
</tr>
<tr>
<td>CRP ~ NLR</td>
<td>0.125</td>
<td>0.0774</td>
</tr>
<tr>
<td>CRP – Procalcitonin</td>
<td>0.0510</td>
<td>0.4399</td>
</tr>
<tr>
<td>NLR ~ Procalcitonin</td>
<td>0.176</td>
<td>0.0012*</td>
</tr>
</tbody>
</table>

ANC: Absolute Neutrophil Count, NLR: Neutrophil Lymphocyte Ratio and CRP: C-Reactive Protein.*p<0.05 Statistically Significant, p<0.001 Statistically highly significant.
Discussion

A reliable marker for bacterial disease should carry out the following criteria: early prognostic diagnostic and values and should be additionally helpful for therapeutic antimicrobial decisions\[13\]. BM is a pediatric emergency with increase morbidity and mortality, so it must be diagnosed and treated immediately. But identical clinical presentation often creates it tricky to discriminate bacterial and non-bacterial etiologies in children \[14\]

CSF analysis was considered the standard for estimation of BM, together with WBC count and CRP. Also, clinical criteria, gram staining and bacterial antigen testing of CSF as well or CSF (glucose, protein, WBC and neutrophil count) used alone lack the specificity and sensitivity for the diagnosis of meningitis and can only provide clinical probability\[15,16\].

Procalcitonin has been considered to be a typical marker with the highest rigor for bacterial infections due to giving an early diagnosis, give information about the course and prognosis of the disease and rapid therapeutic decisions\[17\].

PCT have good sensitive and specific properties for diagnosis of meningitis.\[18\]. In this study, serum PCT significantly higher in children with BM than healthy control groups. This result documented with other researches where PCT concentration increased in bacterial meningitis as compare to other sources of infection with bacterial meningitis \[19-21\].

This elevation in serum PCT of BM due to the release of PCT from all differentiated cell types and parenchymal tissues throughout the body in response to elevated calcitonin gene (CALC-I gene) expression in the presence of bacterial lipopolysaccharides and cytokines associated with severe bacterial infections. PCT secretion during inflammation depends from bacterial endotoxins and inflammatory cytokines, interleukins 6 (IL-6) and tumor necrosis factor (TNF alpha)\[22\]. In contrast to this, there is a transient increase of PCT in patients with viral infection. Furthermore, a rapid response characterized by increase in serum PCT levels after a bacterial stimulus which done by giving a single endotoxin injection makes PCT level a sensitive marker for BM\[23\].

The results of this study display that the procalcitonin was more sensitive and specific inflammatory biomarkers in patients group than the CRP and ANC according to the ROC analysis, these results in agreement with other findings which observed that serum PCT level was a good biomarker for differentiation of bacterial meningitis from other causes\[5\].

Morales Casado et al. was concluded that serum PCT performs better than CRP in the detection of bacterial meningitis. Measuring the CRP released in response to inflammation and bacterial infection in BM is less sensitive and specific than measuring PCT\[24\].

Serum PCT level dramatically increased in early stage during the bacterial infection, making it more sensitive and specific than CRP as a marker of systemic bacterial infection in children. Also, increase in PCT concentrations begin from about few hours after a single endotoxin injection, peak at about 6 hours and persistant elevation for over 24 hours\[25\]. WBC count can differentiate bacterial and non-bacterial meningitis\[5\]. In this study, total WBC count was significantly higher in children with BM than the healthy control. The results of this research documented by other studies in that leukocytosis were valuable in distinguishing between bacterial and non-bacterial infections but not an independent predictor of serious bacterial infection like PCT and CRP, \[28,29\]. PCT is more worthy than CRP or and total WBC count \[25\]. The results of ROC analysis found that the PCT and ANC were more sensitive and specific biomarkers than CRP and NLR for predicting the diagnosis of BM in febrile children with seizure.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

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References


Evaluation of the Genoprotective and Cytoprotective Activity of Vitamin K-7 Against Doxorubicin in Bone Marrow Cells and Spleen Cells of Rats

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Abstract

Doxorubicin is a chemotherapeutic drug that showed a great treatment potential, unfortunately, it is not-selective to cancer cells and affects many other cells. Vitamin K-7 is available from nutritional sources and dietary supplements, it has been reported that it had many beneficial effects.

Objective: Evaluate the protective effect of vitamin K-7 against cytotoxicity and genotoxicity induced by doxorubicin.

Method: Seventy-two rats divided equally into two groups, each group divided into 6 subgroups as following

Group I: received distilled water.

Group II: received a single dose of Doxorubicin (15mg/kg).

Group III: received Vitamin K-7 (16μg/kg) for 11 successive days.

Group IV: received Vitamin K-7 (48μg/kg) for 11 successive days.

Group V: received Vitamin K-7 (16μg/kg) for 11 consecutive days before a single dose of Doxorubicin 15mg/kg on day 11.

Group VI: received Vitamin K-7 at a dose of 48 μg/kg for 11 consecutive days before a single dose of Doxorubicin 15 mg/kg at day 11.

Results: Group II caused significant reduction (P<0.05) in mitotic index associated with an elevation in the micronucleus appearance and the total chromosomal aberrations compared to those of control Group I rats; meanwhile, Groups IV and V decreased chromosomal aberration, micronucleus appearance and increase mitotic index compared to Group II rats treated with doxorubicin.

Conclusion: Vitamin K-7 has protective effects against genotoxicity and cytotoxicity induced by doxorubicin.

Keywords: Doxorubicin, Vitamin K-7, micronucleus appearance, mitotic index, chromosomal aberration.

Introduction

Doxorubicin (DOX) is an anthracycline drug that showed a great treatment potential, being regarded as one of the highly potent of the Food and Drug Administration (FDA) approved chemotherapeutic drugs(1). Such a drug can combat rapidly dividing cells and suppress disease progression. Despite its broad therapeutic effectiveness, it has been reported that the major hindering factor of DOX chemotherapy is its significant toxic effect on various organs; furthermore, early clinical assessments on DOX during phase II and III studies showed common side effects of acute vomiting and nausea, gastrointestinal (GI) problems, baldness, and disturbances to the nervous system (often causing hallucinations and light-headedness)(2). Unfortunately, DOX has been reported not to be specifically targeted only cancer cells but, it can also affect the growth of many other cell types in the body. The severity of unwanted effects and their occurrence by DOX may depend on the dosage of such a chemotherapeutic drug and the duration of its use(3).
Moreover, authors have been well documented that DOX had toxic effects mostly on the bone marrow (BM) cells(4), heart(5), liver(6), brain(7), kidney(8) and testis(9).

Vitamins are essential micronutrients that are very important for physical well-being conditions, and vitamin deficiency can have serious health consequences(10).

Vitamin K is a fat-soluble vitamin, which presents in three forms: vitamin K-1 (phylloquinone), vitamin K-2 (menaquinone), and vitamin K-3 (menadione). In general vitamin K plays essential roles in blood coagulation, regulation of calcium metabolism in tissues, cell growth and proliferation, oxidative stress (OS), inflammatory reactions, and hemostasis(11)(12).

Vitamin K-7 (menaquinone-7) is the common name for vitamin K-2 (13). Vitamin K-7 is a long-chain menaquinone that is not produced by human tissue (14). Moreover, vitamin K-7 may be produced by phylloquinone (vitamin K-1) in the colon by Escherichia coli bacteria(15). However, these menaquinones synthesized by bacteria in the gut appear to contribute minimally to overall vitamin K status(16,17). Moreover, vitamin K-7 is rapidly becoming popular as a supplement and is available as over the counter, it has also been reported that such type of vitamin K had beneficial effects like reduce the risk of osteoporosis, osteoarthritis (OA), and vascular and tissue calcification(18).

Chromosomal aberration it’s any change in either the structure of chromosome called or the number of chromosomes(19). Structural abnormalities examples are deletions, ring chromosomes acentric chromosomes or dicentric chromosome(20).

Mitotic index is a measure for the proliferation status of a cell population and defined as the ratio between the number of cells in mitosis and the total number of cells(21).

Materials and Method

Animals and Treatment Protocols: Seventy-two(72) adult Wistar Albino experimental rats of both sexes, weighing 160-250gm were used in this study; they were obtained from and maintained in the Animal House of the College of Pharmacy, University of Baghdad. The animals were maintained under normal conditions of temperature, humidity and light/dark cycle.

The experimental rats were randomly allocated into six groups, each containing 6 rats as follows:

**Group I**: Rats received 0.5ml of distilled water (D.W.) intraperitoneally (IP) injected, this group served as (negative control).

**Group II**: Rats were IP injected with a single dose of DOX (15mg/kg BW) (positive control).

**Group III**: Animals received MK-7 (16μg/kg BW/day) orally by oral gavage for 11 successive days.

**Group IV**:Animals were administered MK-7 (48μg/kg BW/day) orally by oral gavage for 11 successive days.

**Group V**: Rats received MK-7 (16μg/kg BW/day) orally by oral gavage for 11 successive days before a single IP dose of DOX 15mg/kg on day 11.

**Group VI**: Animals treated with MK-7 at a dose of 48μg/kg orally-administered once daily for 11 consecutive days before a single IP dose of DOX 15 mg/kg on day 11.

Evaluation of the mitotic index and chromosomal aberrations in bone marrow cells and spleen-cells: After 24 hours of the end of treatment, all rats were IP injected with 1mg/kg colchicine, and then two hours later, the animals were sacrificed by cervical dislocation. The BM sample of each rat was aspirated from the femur bone and spleen cells have been extracted from spleen, as previously reported elsewhere(22).

**Evaluation of the micronucleus appearance in bone marrow (BM) cells**: At the end of treatment, rats were sacrificed by cervical dislocation. Bone marrow (BM) samples were aspirated from the femur bone by using fetal calf serum and processed using for the evaluation of an appearance of micronucleus(22).

**Statistical Analysis**: All results of the study were demonstrated as Mean± Standard deviation (SD) and data input and analysis were examined by Statistical package for social sciences program version 24 (SPSS V 24) and ANOVA test was performed to compare among test groups; and (P values<0.05) were regarded as statistically significant.

Results

Table (1) showed that, Group III rats produced a non-significant difference in mitotic index compared to such index in negative control rats (P>0.05) in both BM- and spleen-cells; but at the Group IV rats, the mitotic index was significantly increased (P<0.05) compared to negative control rats in both BM- and spleen-cells. Moreover, mitotic index was significantly different when comparison was Group II, Group V and Group VI (P<0.05) in both BM- and spleen cells. Additionally, There was a significant difference (P<0.05) in the mitotic index Group V and Group VI in both BM- and spleen-cells.
Table (1). Effects of various treatments on the incidence of mitotic index in the bone marrow and spleen cells of experimental rats’ groups

<table>
<thead>
<tr>
<th>Treatment Groups</th>
<th>Mitotic Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bone Marrow Cells</td>
</tr>
<tr>
<td>Distilled water (Negative control) (Group I)</td>
<td>14.1±3.2</td>
</tr>
<tr>
<td>Doxorubicin (Positive control) 15mg/kg (Group II)</td>
<td>4.67±1.6*a</td>
</tr>
<tr>
<td>Vitamin K-7 at dose 16µg/kg (Group III)</td>
<td>13.3±2.2</td>
</tr>
<tr>
<td>Vitamin K-7 at dose 48 µg/kg (Group IV)</td>
<td>18.6±2.7*</td>
</tr>
<tr>
<td>Doxorubicin 15 mg/kg plus</td>
<td></td>
</tr>
<tr>
<td>Vitamin K-7 at dose 16 µg/kg (Group V)</td>
<td>7.8±2.3Ab</td>
</tr>
<tr>
<td>Doxorubicin 15 mg/kg plus</td>
<td>9.1±1.4Bc</td>
</tr>
</tbody>
</table>

Data are expressed as mean±SD.

*significantly different compared to distilled water (P<0.05).

• Values with non-identical small letters superscripts (a, b, and c) are considered significantly different when a comparison among group II, group V and group VI (P<0.05).

• Values with non-identical capital letters superscripts (A, and B) are considered significantly different when a comparison between group V and group VI (P<0.05).

In table (2), Group III produced a non-significant difference (P>0.05) in the micronucleus appearance compared to negative control rats in BM cells; but, when the dose of vitamin K-7 increased to 48µg/kg, the micronucleus appearance was significantly decreased when compared to negative control in BM cells (P<0.05). Moreover, the micronucleus appearance was significantly different when comparison was made among Group II, Group V, and Group VI in BM cells (P<0.05); In addition, there is a significant difference (P<0.05) in the micronucleus appearance in BM cells of Group V and Group VI rats.

Table (2): Effects of various treatments on the incidence of micronucleus appearance in the bone marrow of experimental rats’ groups

<table>
<thead>
<tr>
<th>Treatment Groups</th>
<th>Micronucleus Appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distilled water (Negative control) (Group I)</td>
<td>3.8±1.2</td>
</tr>
<tr>
<td>Doxorubicin (Positive control) 15mg/kg (Group II)</td>
<td>31.3±2.1*a</td>
</tr>
<tr>
<td>Vitamin K-7 at dose 16µg/kg (Group III)</td>
<td>4.5±2.1</td>
</tr>
<tr>
<td>Vitamin K-7 at dose 48 µg/kg (Group IV)</td>
<td>2.1±1.1</td>
</tr>
<tr>
<td>Doxorubicin 15 mg/kg plus</td>
<td></td>
</tr>
<tr>
<td>Vitamin K-7 at dose 16 µg/kg (Group V)</td>
<td>24.5±2.1 Ab</td>
</tr>
<tr>
<td>Doxorubicin 15 mg/kg plus</td>
<td></td>
</tr>
<tr>
<td>Vitamin K-7 at dose 48 µg/kg (Group VI)</td>
<td>16.1±2.8Bc</td>
</tr>
</tbody>
</table>

Data are expressed as mean±SD.

*significantly different compared to distilled water (P<0.05).

• Values with non-identical small letters superscripts (a, b, and c) are considered significantly different when a comparison among group II, group V and group VI (P<0.05).

• Values with non-identical capital letters superscripts (A, and B) are considered significantly different when a comparison between group V and group VI (P<0.05).

(P<0.05).
In the table (3), Group III and IV produced a non-significance difference ($P<0.05$) in total chromosomal aberrations compared to negative control rats in both BM- and spleen- cells. Furthermore, total chromosomal aberrations were significantly different ($P<0.05$) in BM-and spleen-cells when comparison was made among doxorubicin Group II, Group V, and Group VI. Additionally, there was a significant difference ($P<0.05$) in total chromosomal aberrations in Group V rats compared to the corresponding aberrations in Group VI rats both bone marrow cells and spleen cells.

Table (3): Effects of various treatments on the incidence of total chromosomal aberrations in bone marrow cells and spleen cells of experimental rats’ groups

<table>
<thead>
<tr>
<th>Treatment Groups</th>
<th>Total Chromosomal Aberration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bone Marrow Cells</td>
</tr>
<tr>
<td>Distilled water (Negative control)</td>
<td>0.09±0.05</td>
</tr>
<tr>
<td>Doxorubicin (Positive control) 15mg/kg</td>
<td>0.34±0.01*a</td>
</tr>
<tr>
<td>Vitamin K7 at dose 16µg/kg</td>
<td>0.07±0.02</td>
</tr>
<tr>
<td>Vitamin K7 at dose 48 µg/kg</td>
<td>0.05±0.01</td>
</tr>
<tr>
<td>Doxorubicin 15 mg/kg plus Vitamin K7 at dose 16 µg/kg</td>
<td>0.22±0.02Ab</td>
</tr>
<tr>
<td>Doxorubicin 15 mg/kg plus Vitamin K7 at dose 48 µg/kg</td>
<td>0.176±0.03bc</td>
</tr>
</tbody>
</table>

Data are expressed as mean±SD.
*significantly different compared to distilled water ($P<0.05$).
• Values with non-identical small letters superscripts (a, b, and c) are considered significantly different when a comparison among group II, group V and group VI ($P<0.05$).
• Values with non-identical capital letters superscripts (A, and B) are considered significantly different when a comparison between group V and group VI ($P<0.05$).

Discussion

In the current study, in Group II rats caused significant reduction ($P<0.05$) in the mitotic index associated with an elevation in the micronucleus appearance in bone marrow cells and elevation in the chromosomal aberrations in both bone marrow and spleen-cells compared to those in negative control; meanwhile,(Group IV) and (Group V), decreased chromosomal aberrations, micronucleus appearance and increased mitotic index compared to those in (Group II) rats. Tables (1, 2, and 3)

A previous study showed that reactive oxygen species (ROS) cause DNA damage in cells\(^{(23, 24)}\). Moreover, mitochondria are the site of ROS production due to electrons escaping from electron transport chain and production of superoxide anion ($O_2^{-}$); moreover, DOX can drive these ROS productions through enzymes within the mitochondria, including the reduced form of nicotinamide adenine dinucleotide phosphate (NADPH) oxidase, cytochrome P-450 reductase, and xanthine oxidase (XO), can convert DOX in the form of quinone to semiquinone\(^{(25)}\), which can be regenerated back to its parental quinone readily by reacting with oxygen with the generation of $O_2^{-}$, which in turn could further be changed to other ROS\(^{(26)}\), but vitamin K can alter redox balance in cells\(^{(27)}\). In its reduced form, vitamin K hydroquinone (KH2) can protect phospholipid membranes from peroxidation by ROSuptake\(^{(28)}\). Furthermore, vitamin K inhibited\(^{(29)}\) 12-lipoygenase enzyme which preventsROS formation\(^{(29)}\); also vitamin K reduces OS by lowering levels of pro-inflammatory factors\(^{(30)}\).

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.
Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

References


Assessment of Serum Interleukin-4 and Filaggrin Protein in Patients with Atopic Dermatitis

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Abstract

The current study aimed to determine the relationship between certain immunological parameters in a topic dermatitis (AD) patients.

There was no significant differences (P≥0.05)in the level of filaggrin protein between patients and control groups regarding to the age but there was a significant differences (P≤ 0.05)in the level of IL-4 between patients and healthy subjects groups regarding to the age, also the study showed that there was no significant differences (P≥0.05) between study groups regarding the gender for above two parameters.

The data of current study support the defected skin barrier role in the AD pathogenesis, in addition the results revealed filaggrin reduced expression in atopic skin lesion and inverse correlation between filaggrin protein expression and disease severity. Add to that, the elevation of circulation interleukin IL-4 levels in AD, emphasizes the profile of systemic inflammation of this skin barrier defective dermatosis.

Keywords: IL-4; Filaggrin protein; Atopic dermatitis.

Introduction

Atopic dermatitis (AD) is the most common chronic inflammatory skin disease[1]. It starts in early infant life and remains lifelong with therapeutic difficulty especially when it is in moderate or severe form[2]. Its etiology remains poorly understood but it is believed as multifactorial with complex combination of deviation in the immune system, defective barrier function and risk of environmental factors[3,4] leading to allergens skin sensitization as a result of mutations affecting the epidermal barrier or because of an inflammation that inhibit the epidermal differentiation[5].

AD as a heterogeneous disease, activating more than one inflammatory pathway with psoriasis where IL-4 play an important role in the allergic response. IL-4 and IL-13 are involved in the promotion of isotype class switching from IgM to IgE that stimulate T cell differentiation to Th2 and B cells antigen presenting enhancement[6]. Filament aggregating protein (filaggrin) is important for cornified cell envelope (CCE) formation that is needed for effective skin barrier where it binds to and facilitates keratins (K1/10) aggregation that induce the collapse of cytoskeleton to formcornocytes[7].

Materials and Method

Patients and Control: The work was applied on 49 patients (23 males, 26 females) admitted to the Imam Sadiq Hospital & Merjan Hospital (Dermatology Advisory Unit) in Babylon Governorate and 30 healthy subjects (11 males, 20 females) without prior clinical signs as control group. All patients were initially diagnosed by specialist physician.

Blood Samples: The blood samples (5ml) were drawn from each patients and control groups by vein puncture using disposable syringes. The blood was placed in the Jell tube and kept to clot at room temperature, then centrifuged at 3000 rpm for 10 min., after that, sera samples were carefully transferred to Eppendorf tubes and preserved at -20°C untiluse.

Immunological Tests: The levels of immunological criteria IL-4 and Filaggrin, were estimated by ELISA Kit according to the manual procedures of Elabscience (USA) and Biolabs (China) respectively.

Statistical Analysis: The results were analyzed using the ANOVA-LSD-General Linear Model and SPSS (copyright 16).
Results

The results of the present study (Table 1), showed no significant differences (P ≥ 0.05) in the Filaggrin protein level between patients and control groups regarding to the age, also the study showed increase the concentration of this parameter in age category ≤ 20 years, while the low of its level represented in age category (≥ 60) years as revealed in figure (1). Whereas the results for IL-4 cytokine was show a significant differences (P ≤ 0.05) between patients and controls regarding to the age; and the study shown increases the concentration of IL-4 in age category (41-60) years, while a low concentration was demonstrated in the age group ≥ 60 years Figure (1).

Regarding to the gender the results in Table 2 and Figure (2) were showed no significant differences (P ≥ 0.05) between patients and controls in the levels of filaggrin protein and IL-4.

Table 1: The levels of filaggrin protein and IL-4 in patients with atopic dermatitis according to the age groups.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Age (Year)</th>
<th>NO.</th>
<th>Filaggrin protein (ng) Mean±S.E</th>
<th>IL-4 (Pg/ml) Mean±S.E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>≤20</td>
<td>13</td>
<td>4.58±4.13</td>
<td>273.11±100.5</td>
</tr>
<tr>
<td></td>
<td>21-40</td>
<td>7</td>
<td>2.94±3.57</td>
<td>148.30±90.51</td>
</tr>
<tr>
<td></td>
<td>41-60</td>
<td>9</td>
<td>2.28±1.17</td>
<td>273.07±99.63</td>
</tr>
<tr>
<td></td>
<td>≥60</td>
<td>2</td>
<td>1.32±0.41</td>
<td>131.67±73.07</td>
</tr>
<tr>
<td>Patients</td>
<td>≤20</td>
<td>14</td>
<td>3.33±1.12</td>
<td>66.50±29.23</td>
</tr>
<tr>
<td></td>
<td>21-40</td>
<td>23</td>
<td>3.09±1.15</td>
<td>77.72±24.22</td>
</tr>
<tr>
<td></td>
<td>41-60</td>
<td>11</td>
<td>2.81±0.74</td>
<td>79.70±26.50</td>
</tr>
<tr>
<td></td>
<td>≥60</td>
<td>1</td>
<td>1.44±0.0</td>
<td>58.09±0.0</td>
</tr>
<tr>
<td>LSD(0.05)</td>
<td></td>
<td></td>
<td>N.S</td>
<td>25.123</td>
</tr>
</tbody>
</table>

Table 2: The levels of filaggrin protein and IL-4 in patients with atopic dermatitis according to the gender.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Gender</th>
<th>Filaggrin protein (ng) Mean±S.E</th>
<th>IL-4 (Pg/ml) Mean±S.E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Male (n.11)</td>
<td>4.18±1.26</td>
<td>129.00±25.54</td>
</tr>
<tr>
<td></td>
<td>Female (n.20)</td>
<td>2.86±0.62</td>
<td>294.52±59.19</td>
</tr>
<tr>
<td>Patients</td>
<td>Male (n.23)</td>
<td>3.42±0.84</td>
<td>65.42±5.17</td>
</tr>
<tr>
<td></td>
<td>Female (n.26)</td>
<td>2.74±0.60</td>
<td>82.64±19.47</td>
</tr>
<tr>
<td>LSD(0.05)</td>
<td></td>
<td>2.471</td>
<td>105.41</td>
</tr>
</tbody>
</table>
**Discussion**

The results of immunological criteria showed that there were no significant differences (P ≥ 0.05) in the concentration of filaggrin protein and the correlation analysis showed no correlation significant between age and gender for atopic groups compared with controls.

Filaggrin protein: Acute AD skin is associated with Th2 cytokines over expression (IL-4 and IL-13), combined with increased filaggrin expression. Therefore, whether these cytokines alter the filaggrin expression was investigated.

The current study indicated that this deficiency is partially due to the Th2 cytokines over expression that inhibit filaggrin expression that agree with[8].

Further studies need to be conducted to determine whether the early AD treatment may repair skin barrier defect. There is an association between filaggrin gene mutation and AD[9].

**Interleukin-4 (IL-4):** The results revealed a significant difference (P ≤0.05) and also a significant correlation with age between atopic and control groups.

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**Figure 1:** The levels of filaggrin protein and IL-4 in patients with atopic dermatitis according to the age groups

**Figure 2:** The levels of filaggrin protein and IL-4 in patients with atopic dermatitis according to the gender
The present study agree with\(^{[10]}\) who indicated that acute skin lesions contain more cells that produce IL-4, IL-5 and IL-13, but not IFN-\(\gamma\) in comparison with chronic lesions where IL-4 and IL-13 are significantly decreased and increased cells expressing IL-5 and IFN-\(\gamma\)\(^{[11]}\).

IL-4 Overexpression in the epidermis, developed all marks of AD like increased inflammatory cells in the skin, pruritus, skin bacterial infection and increased IgG1 and IgE\(^{[12]}\).

The results of this study disagree with\(^{[13]}\) reported that the Th2 cells are responsible for the development of the humoral immune response and the hyperproduction of IL-4, IL-10, IL-13 in allergic diseases.

Another study showed high serum levels of cytokines in the eczematous lesions patients either acute or chronic, due to increased Th2 cells secreting IL-4 and IL-13, while high TNF serum levels in chronic lesions\(^{[14]}\).

The current study agree with the results of\(^{[15]}\) whom observed higher levels of IL-4, IL-13 and IFN-\(\gamma\) in chronic eczema.

**Conclusion**

The data of current study support the defected skin barrier role in the AD pathogenesis, in addition the results revealed filaggrin reduced expression in atopic skin lesion and inverse correlation between filaggrin protein expression and disease severity. Add to that, the elevation of circulation interleukin IL-4 levels in AD, emphasizes the profile of systemic inflammation of this skin barrier defective dermatosis.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

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Synthesis of New Drug Carriers of Metronidazole as Antifungal Agents

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Abstract

New drug carriers were synthesised through etherification with sugar moiety and metronidazole drug. The synthetic pathway was started with two sugars, β-D-glucose and β-D-fructose, which were protected as peracetate and benzoate respectively, then converted to bromo sugar. The bromo sugars were subjected to coupling with metronidazole drug via Willemenson reaction to afford protected drug carriers. All prepared compounds were characterised via FT-IR, $¹$H-NMR and $¹³$C-NMR and HR-MS spectroscopy. These new carriers were tested against four types of fungi kandida yeast. Some of tested compounds showed moderate activity while the other showed weak inhibition. Interestingly, two carrier drugs showed high activity against fungi.

Keywords: Prodrug, metronidazole, nucleosides, antifungal.

Introduction

Since 1958, when Albert(1) initially coined the term prodrug and used to refer to pharmacologically compounds, the carrier-linked prodrugs are imparting some desirable properties to the drugs such as increased lipid or water solubility or site-directed delivery or decreased toxicity and prolonged or shortened action(2).

Meteronidazole, 2-methyl-5-nitroimidazole-1-ethanol (flagyl), is the most useful of a group of antiprotzoal drugs that have synthesized in several laboratories. This drug is accommodating amebicidal activity; it is valuable against both intestinal and hepatic amebiasis. It has also been explored of the use in the treatment of such other protozoal diseases as giardiasis(3-6). Because of its bactericidal action, it became an important agent for treatment of serious infections (e.g. septicemia, pneumonia and meningitis) caused by anaerobic bacteria(7-9).

Since meteronidazole is sparingly soluble in water, our target is to link meteronidazole with sugar as carrier, which called a promoiety through glycoside linkage to increase their solubility in water. The glycosidase enzyme found in colon bectria, allows hydrolysis of glycoside derivatives of drug in the colon, that is the side of action, and provides higher concentrations of active drug.(10,11)

Nucleosides, both of natural and synthetic origin have at least some biological activity.(12) Such as potential anti-viral(13) fungicidal, and anticancer agents(14,15). Nucleoside analogues play significant role in several established chemotherapies (anticancer, antiviral and antibacterial).(16-19)

A new methodology to synthesis a new modified prodrugs using two kinds of protected sugars and meteronidazole was developed in this article. The new prodrugs were examined against fungi to evaluate them as antimicrobial and antifungal agents. Expectedly, the new compounds showed higher activity against fungi.

General experimental: All chemicals were
Preparation of β-D Glucose Penta Acetate(20)

(2): β-D glucose (0.0055 mole) and (0.00975 mole) an hydrous sodium acetate were dissolved in (6mL) acetic anhydride, and then heated under reflux for 2hrs. The resulting mixture was poured on to (50mL) of ice-cold water, then filtered and recrystallized form ethanol to afford a white crystal (2) m.p: (131-132 °C); IR (thin film) cm⁻¹ 2918 (m) (CH aliphatic, stretch), 1720 (s) (C=O ester, stretch); ¹H-NMR (500 MHz, CDCl₃) δ_H 2.2 (5x 3H, s, 5CH₃), 4.2 (2H, s, CH₂), 4.6 (2 x 1H, d, 2CH), 5.1 (2 x 1H, d, 2CH), 6.21 (1H, d, CH); ¹³C-NMR (125 MHz, CDCl₃) δ_C 25 (5CH₃), 64 (CH₂), 71 (2CH), 75 (2CH), 175 (SCO); HRMS(EI⁺) found 390.2303, C₁₆H₂₂O₁₁ requires 390.2301.

General Procedure for Synthesis of 1-Bromo Acetylated Sugar(21)(3): The acetylated sugar (1) (0.38 g 0.0024 mole) was dissolved in (3 ml) of (50%) hydrogen peroxide, then was added as a catalyst. Flagyl (Metronidazole) (4.3 g, 0.1 mol) was dissolved in absolute ethanol (10 ml) and was added through dropping funnel to the stirred reaction mixture over a period of about 1 hr. The stirring is continued for 24 hr. The resulting mixture was filtered off through and the residue is washed well with chloroform. The filtrate and washings are combined together, and concentrated under reduced pressure. The residue was re-crystallized from chloroform to give brown dark powder of compound (5) in yield 75% (m.p. 197-199 °C), RF (0.75) (benzene: methanol, 6:4); IR (thin film) cm⁻¹ 2918 (m) (CH aliphatic, stretch), 1720 (s) (C=O ester, stretch), 1612 (C=N, stretch); ¹H-NMR (500 MHz, CDCl₃) δ_H 1.7 (3H, s, CH₃), 2.2 (4x 3H, s, 4CH₃), 4.2 (2H, s, CH₂), 3.6 (2H, t, CH₂O), 3.8 (2H, t, CH₂N), 4.6 (2 x 1H, d, 2CH), 5.1 (2 x 1H, d, 2CH), 6.21 (1H, d, CH), 7.5 (1H, s, CH=N); ¹³C-NMR (125 MHz, CDCl₃) δ_C 12 (CH₃), 22 (4CH₃), 65 (CH₂), 67 (CH₇), 71 (2CH), 75 (2CH), 72 (2CH), 140 (C=NO₂), 158 (CH=NO), 172 (4CO); HRMS(EI⁺) found 459.2303, C₂₀H₁₉O₁₂ requires 459.2301.

Hydrolysis of protected prodrug (6)(22): A solution of (0.0026 mole) of the blocked nucleoside analogue in (7mL) of (0.1 M) methanolic sodium methoxide was heated under reflux for 30 min. The reaction mixture was neutralized with acetic acid and concentrated to dryness. The residue was portioned between water and chloroform. The aqueous phase evaporated to dryness under vacuum to give free prodrug (6): (m.p. 197-199 °C), RF (0.75) (benzene: methanol, 6:4); IR (thin film) cm⁻¹ 2320 (s) (OH Stretch), 2918 (m) (CH aliphatic, stretch), 1612 (C=Nimidazo, stretch); ¹H-NMR (500 MHz, CDCl₃) δ_H 1.7(3H, s, CH₃), 4.4 (2H, s, CH₂), 3.5 (2H, t, CH₂O), 3.7 (2H, t, CH₂N), 4.6 (2 x 1H, d, 2CH), 5.1 (2 x 1H, d, 2CH), 6.21 (1H, d, CH), 7.5 (1H, s, CH=N); ¹³C-NMR (125 MHz, CDCl₃) δ_C 12 (CH₃), 22 (4CH₃), 65 (CH₂), 67 (CH₇), 70 (4COH), 74 (2CH), 77 (2CH), 128 (CH), 140 (C=NO₂), 158 (CH=NO), 172 (4CO); HRMS(EI⁺) found 451.2303, C₂₀H₁₉O₁₂ requires 451.2301.

Protection and Preparation of Sugar Moiety: 1,3,4,6-tetra-O-benzoyl-β-D-fructofuranose (8)(23): Benzoyl chloride (7 ml) was added dropwise to anhydrous-D-fructose (2 g, 11.11 mmol) that suspended in mixture of chloroform (30 ml) and dry pyridine (5 ml), after that the mixture was heated at 318–338 K with continuous stirring for 4 h. The mixture was poured over ice-water, and then extracted with CHCl₃ (3x15 ml). The organic layer was washed with 5% HCl solution (10 ml). The organic layer was naturalized with 5% of sodium carbonate solution (10 ml), after that the organic layer was dried over sodium sulphate and the purchased from Sigma-Aldrich unless otherwise stated. ¹H-NMR spectra were measured on a Bruker Avance 500 MHz spectrometer or on a Bruker Avance DPX 400 NMR spectrometer. ¹³C-NMR spectra were measured on a Bruker Avance 500 MHz spectrometer (Isfahan University of Technology (IUT), Iran) and Sharif University of Technology (SUT).
solvent was concentrated under vacuum to give a syrup that crystallized from absolute ethanol to afford white crystals (m.p. 394–395 K); IR (thin film) cm⁻¹ 3064 (m) (CH aromatic, stretch), 2918 (m) (CH aliphatic, stretch), 1720 (s) (C=O ester, stretch), 1655 (m) (C=O aromatic, stretch); ¹H-NMR (500 MHz, CDCl₃) δH 3.0-3.1 (2H, s, CH₂OBez), 3.3-3.4 (2H, s, 2CH), 7.3-7.4 (10H, m, 10CH aromatic), 7.8-7.9 (10H, m, 10CH aromatic); ¹³C-NMR (125 MHz, CDCl₃) δC 64 (CH₂O), 70 (2CH), 92 (2CO), 130 (8CH aromatic), 134 (8CH aromatic), 138 (4CH aromatic), 138 (4CC=O), 170 (4C=O); HRMS(EI⁺) found 612.2303, C₃₄H₂₃O₁₁ requires 612.2301.

1,3,4,6- Tetra-O-benzoyl-β-D-fructofuranosyl bromide(9)(2¹); Hydrogen bromide in glacial acetic acid (45%) (5 ml) was added to tetrabenzoyl fructofuranose 4 (2 g, 3.36 mmole), then (5 ml) of glacial acetic acid was added, the mixture was stirred for 30 min. at room temperature and left for 6 h. at room temperature, and mixture was neutralized with sodium bicarbonate solution, then extracted with chloroform (3 x 15 ml). The organic layers were dried over sodium sulphate, filtered and evaporated in vacuo to give brown syrup; IR (thin film) cm⁻¹ 3217 (broad s) (OH, stretch), 3064 (m) (CH aromatic, stretch), 2918 (m) (CH aliphatic, stretch), 1720 (s) (C=O ester, stretch), 1655 (m) (C=O aromatic, stretch); ¹H-NMR (500 MHz, CDCl₃) δH 2.1-2.3 (1H, s, CH aromatic), 4.5-4.6 (2H, s, 2CH), 7.3-7.4 (10H, m, 10CH aromatic), 7.5-7.6 (4H, m, 4CH aromatic); ¹³C-NMR (125 MHz, CDCl₃) δC 64 (CH₂O), 70 (2CH), 92 (2CO), 119 (2CH aromatic), 128 (2CH aromatic), 130 (8CH aromatic), 134 (8CH aromatic), 138 (4CC=O), 147 (2C=O aromatic), 170 (4C=O); HRMS(EI⁺) found 782.125 C₄₀H₃₆O₁₄N₃ requires 782.123.

Hydrolysis of protected prodrug(11)(2²); A solution of (0.0026mole) of the blocked prodrug 7 in (7mL) of (0.1 M) methanolic sodium methoxide was refluxed with stirring for (0.5 h). The mixture was neutralized with acetic acid and evaporated to dryness. The residue was portioned between water and chloroform. The aqueous phase evaporated to dryness under vacuum to obtain free prodrug (6). The residue was re-crystallised from chloroform to give brown dark powder in the yield 80 % (m.p. 320-333 K), Rf = 0.85 (benzene:methanol = 6:5); IR (thin film) cm⁻¹ 3225 (OH, stretch), 3070 (m) (CH aromatic, stretch), 2925 (m) (CH aliphatic, stretch), 1720 (s) (C=O ester, stretch), 1450 (m) (C=C aromatic, stretch), 7.5-7.6 (5H, m, 5CH aromatic), 7.5-7.6 (Hₛ, CH=N); ¹³C-NMR (125 MHz, CDCl₃) δC 12 (CH₃), 45 (CH₂CO), 64 (2CH₂O), 70 (2CH), 92 (2CO), 119 (2CH aromatic), 128 (2CH aromatic), 130 (8CH aromatic), 134 (8CH aromatic), 136 (4CH aromatic), 138 (4CC=O), 147 (2C=O aromatic), 170 (4C=O); HRMS(EI⁺) found 782.125 C₄₀H₃₆O₁₄N₃ requires 782.123.

Results and Discussion

To incorporate molecules containing several reactive centers, and adopt different conformation in solution like mono saccharides in a synthetic organic reaction, it is essential to block the unwanted reactive sites, and also restrict these molecules in one conformation which were required to the synthetic project successfully. β-D-glucose(1) was protected as a stable ester derivative using acetic anhydride in presence of sodium acetate afforded β - D-glucose penta acetate (2) Figure 1, then fully protected glucose treated with hydrogen bromide undergo specific displacement reaction at numeric center to give axial (α-anomer) halide, the α-halo anomer is substantially preferred,(2⁴)the short mechanism for
formation of \(\alpha\)-bromo sugar\(^3\) illustrated in Figure 2. Then, \(\alpha\)-bromo sugar\(^3\) was coupled with metronidazole (4) as nucleobase through nucleophilic substitution of hydroxyl group of metronidazole (4) on sugar bromide (3) afforded new blocked nucleoside (5) analogue, which after hydrolysed gave analogue 6 free hydroxyl groups. The FT-IR spectrum of this analogue (6) showed stretching band at 3230 cm\(^{-1}\) (stretch OH), and this was good evidence to form this compound.

The second sugar used in this article was \(\beta\)-D-fructose, which protected their hydroxyls at C-1, C-3, C-4 and C-6 leaving hydroxyl group at C-2 free for further chemical modification.\(^{26}\) In same manner, per benzoate fructose (8) was turned to \(\alpha\)-bromo sugar (9) as syrup, which coupled with metronidazole (4) as nucleobase through nucleophilic substitution of hydroxyl group of metronidazole (4) on sugar bromide (9) yielded new blocked nucleoside analogue (10), which after hydrolysis gave pro drug (11).

![Figure 1: Total synthesis of prod rug 6 and 11](image-url)
Antifungal activity of compounds 2-10: Since the metronidazole derivatives and prodrugs have been reported in the literature as antifungal [3] activity, most of these prepared compounds were examined to inhibit fungal spore germination and hyphal growth in this article. Aliquots of solutions of eight purified compounds 2, 3 and 5-10 along with compound 4 (metronidazole) were arrayed on silica TLC plates (Figure 3) and either visualized with a vanillin-$\text{H}_2\text{SO}_4$ rising reagent (left panel) or exposed to a fungal overlay bioassay (right). Antifungal activity was obvious as white zones sparkly an inhibition of spore germination and hyphal growth, only compound 4 and compounds (6,11) exhibited significant anti-fungal activity while no such activity was observed with compounds (5-7) and 3,2. The smallest amount inhibitor concentration (MIC) observed for compound 2 was 3 ng/spt, 10-fold under that necessary for compounds 6 and 11 (30 ng/spot), indicating the importance of metronidazole moiety in sugar for full antifungal activity. However, the lack of antifungal activity with compounds 5-7 suggests that sugar is not sufficient for activity.
References:

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Evaluating of Serum Electrolyte Changes in Chronic Renal Failure Pre and Post Dialysis

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Abstract

Background: The kidney played a vital role in the regulation of electrolyte and acid–base balance. With progressive loss of renal function, derangements in electrolytes and acid–base balance certainly occurred and contribute to worse patient outcomes.

Objective: The aim of the present study is to assess the effect of Hemodialysis (HD) on serum electrolytes levels which compared with healthy control group; also to assess the correlation of serum electrolyte before and after hemodialysis.

Material and Method: The study done on 40 patients (25 men and 15 women) all patients with chronic kidney disease, ages of patients 25 – 65 years. All patients enter the dialysis department in Merjan teaching hospital and matched with 30 well persons as control. Results: study of comparison between patients before and after hemodialysis, significant difference in the level of serum urea and creatinine between pre and post dialysis, and significant effect of Hemodialysis on serum electrolytes particularly serum potassium levels. The pre-hemodialysis $K^+$ was 4.48± 0.83 mmol/L and post-hemodialysis $K^+$ was 3.69±0.65 mmol/L ($P<0.001$). The pre-hemodialysis $Na^+$ was 136.5±4.14 and post-hemodialysis $Na^+$ was 138.6 ±4.41 ($P = 0.36$). The pre-hemodialysis $Cl^-$ was 106.12 ± 4.02 and post-hemodialysis $Cl^-$ was 107.12 ± 4.11 ($P= 0.38$ NS).

Conclusion: There is decrease in s. urea besides creatinine level between period before and after hemodialysis. Serum $K^+$ level decreased after hemodialysis. Although serum sodium and chloride levels not significantly affected after hemodialysis.

Keywords: Chronic renal failure, hemodialysis, serum electrolytes.

Introduction

Chronic renal failure is a worldwide complication, a chief reason of high mortality rate in the developed countries. Patients are at higher risk for cardiovascular disease (CVD) and Hyperkalemia is a usually meet problem in patients with progressive renal disease[1].

Chronic renal failures induce a slow and progressive decline of kidney’s function. It is usually a consequence of complications from another serious medical condition[2].

The major causes of CRF included chronic glomerulonephritis, progressive nephritic syndrome, diabetes mellitus, chronic hypertension, polycystic kidney and chronic pyelonephritis [3].

Dialysis is a process that removes overload fluids and poisonous last part products of metabolism as urea from the plasma and corrects electrolytes balance by dialyzing the patient’s blood against fluid that contain no urea which has levels of minerals like potassium and calcium that are similar to their natural concentration in healthy blood[4].
Dialysis is based on the standard of diffusion equilibrium. In general dialyzing fluid (Dialysate) contains “Na⁺, K⁺ and HCO₃⁻ in a higher concentration than normal plasma (urea, urates, creatinine, phosphate, sulphate are absent)”. If the plasma K⁺ of patient is above normal, K⁺ diffuse out of the blood across the cellophane tubing and in to the dialyzing fluid. Also, waste products and overload of the substances diffuse in to the dialyzing fluid and removed from the body [5].

Hemodialysis is one of the useful method of treatment of hyperkalemia and uremia, also to approve sodium and serum creatinine levels in renal failure. Severe hyperkalemia occur in 10-19% of hemodialysis patients[6]. Many studies showed that a sudden change and decrease in serum K⁺ causes arrhythmia related patients undergoing dialysis[7].

Hypokalemia also arise in dialysis patients due to the exposure to low K (≤ 2 K) dialysate. Post-dialysis hypokalemia associated with serious cardiac arrhythmias and sudden cardiac deaths. And also they stated that 67% were cardiac deaths[8]. The vulnerability to hypokalemia-triggered cardiovascular trial could be related to the cardiovascular diseases, occurring in a majority of end stage renal disease patients [9].

Indialysis patients, hyponatremia is typically dilution, due to overload water or hypotonic fluid intake. Hyponatremia, when persistent, has been seen in those with impaired thirst mechanism or lack of admittance to water. Dysnatremia in chronic kidney disease (CKD) and end stage renal disease has high mortality rate [10].

The study amid to assess the changes in serum potassium, sodium and chloride in pre and post dialysis patients.

### Material and Method

A total of 40 patients were taken for this study. For them (25 males and 15 females) were End stage renal disease (ESRD), aged (25-65) year are admitted to al-dialysis unit in Merjan teaching hospital which compared with 30 healthy as control group. All patients were dialyzed three times a week and each session was at least four hours. They were dialyzed with polysulfone dialyzing membrane. The duration of dialysis ranged from 2-8 years. Subjects suffering from diabetes, acute renal failure, cardiovascular disease, hepatic disease, and any chronic or acute inflammatory illness were excluded from the study. Venous blood (5 ml) was obtained from each patient before and after dialysis. Serum then was separated by centrifugation for (10) minutes, and then divided in aliquots for measurement of serum K⁺, Na⁺, Cl⁻ as well as serum level of creatinine and urea. The control groups consisted of 30 non-hospitalized adults with no history of systemic disease (matched for age and sex).

### Result

In chronic kidney disease patients, serum Urea and Creatinine level was significantly high in pre-HD patients compared to healthy controls as shown in table No(1). The mean levels of serum sodium in pre-HD patients was lower than healthy controls as shown in table (1), also the mean Serum chloride level in pre-HD patients was higher compared to controls as shown in table (1) However, the mean level of serum K⁺ value was significantly high in pre-HD patients compared to healthy controls as shown in table No(1).

### Table 1: Mean±SD of serum electrolytes (Na⁺, K⁺, Cl⁻), level of urea and serum creatinine in controls and pre-hemodialysis patients

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Healthy controls</th>
<th>Pre hemodialysis patients</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea (mmol/l)</td>
<td>4.191 ± 0.80</td>
<td>27.47 ± 8.6</td>
<td>0.0001</td>
</tr>
<tr>
<td>Creatinine(µmol/l)</td>
<td>68.04 ± 3.99</td>
<td>525.58 ± 106.56</td>
<td>0.0001</td>
</tr>
<tr>
<td>Na⁺ (mmol/l)</td>
<td>140.37 ± 1.9</td>
<td>136.87 ± 4.14</td>
<td>0.001</td>
</tr>
<tr>
<td>K⁺ (mmol/l)</td>
<td>3.79 ± 0.65</td>
<td>4.48 ± 0.83</td>
<td>0.0001</td>
</tr>
<tr>
<td>Cl⁻ (mmol/l)</td>
<td>105.04 ± 3.4</td>
<td>106.12 ± 4.02</td>
<td>0.359</td>
</tr>
</tbody>
</table>

P- Value less than 0.05 (significant)
The mean value of blood urea and serum creatinine in the pre-dialysis pts., was higher than post dialysis patients as shown in table No.2, and in post-HD patient’s serum Na\(^+\) levels was slightly higher than pre – HD patients as shown in the table 2. However, the mean level of serum K\(^+\) is significantly lower in post – HD patients compared to pre – HDs patients as shown in table No.2, also the mean serum chloride levels in pre – HD patients not significantly affected after hemodialysis.

Table 2: Mean±SD of serum electrolytes (Na\(^+\), K\(^+\), Cl\(^-\)), level of urea and serum creatinine levels in pre-HD and post – HD patients

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Pre hemodialysis patients</th>
<th>Post hemodialysis patients</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea (mmol/l)</td>
<td>27.47 ± 8.6</td>
<td>20.72 ± 21.40</td>
<td>0.0001</td>
</tr>
<tr>
<td>Creatinine(µmol/l)</td>
<td>525.58 ± 160.56</td>
<td>267.91 ± 84.02</td>
<td>0.0001</td>
</tr>
<tr>
<td>Na(^+) (mmol/l)</td>
<td>136.87 ± 4.14</td>
<td>138.00 ± 4.41</td>
<td>0.03</td>
</tr>
<tr>
<td>K(^+) (mmol/l)</td>
<td>4.48 ± 0.83</td>
<td>3.69 ± 0.65</td>
<td>0.0001</td>
</tr>
<tr>
<td>Cl(^-) (mmol/l)</td>
<td>107.12 ± 4.02</td>
<td>106.12 ± 4.11</td>
<td>0.06</td>
</tr>
</tbody>
</table>

P- Value less than 0.05 (significant)

**Discussion**

The current study show that serum potassium level in post – HD patients was significantly low compared to mean serum level of pre-HD patients. Hyperkalemia reduces the resting membrane potential, slow the conduction velocity and increases the rate of repolarization. Hypokalemia on the other hand increases the resting membrane potential, and refractory period, which are potentially arrhythmogenic. The obtained result was consistent with that reported by Sreenivasulu et al. stated that mean serum potassium levels in post-HD were low compared to pre-HD Patients\(^{[11]}\). Also, The result consistent with other study\(^{[12,13,14,15]}\), observed that mean serum potassium levels in post-HD (3.69±0.65) were low compared to pre-HD Patients (4.48±0.83).

The study results show that chronic kidney disease patients has high level of serum urea is relative to the progression of the disease and is highly influenced by a catabolic state or excessive protein ingestion, leading to a higher production of other waste substances of protein catabolism, and creatinine level increase in chronic kidney disease patients that recognized by low no. of working nephrons, this lead to decrease in GFR, cause significant lowering in the renal flow of water and solutes, this result matches with the result of (Noor ul Amin.)\(^{[16]}\).

In the present study mean serum sodium levels in post-dialysis patient was slightly higher when compared to mean serum sodium levels of pre dialysis patients. Seethalakshmi reported that the mean Na\(^+\) concentration in post –hemodialysis (138.00 ±4.41) patients was high compare to prehemodialysis patients (136.87±4.14)\(^{[15]}\). A study by Naumanobserved that mean serum Na\(^+\) post-hemodialysis patients (138.00±4.41) were higher when compared to pre-hemodialysis patients (136.87±4.14)\(^{[13]}\). In chronic Hemodialysis patients, sodium (Na\(^+\)) balance largely depends on inter dialytic dietary salt intake and intra dialytic Na\(^+\) removal\(^{[17]}\). Dialysis patients appear to have a unique set point for serum sodium\(^{[18]}\). In over-all level of serum K\(^+\) after HD increase 2-4 meq/L suggesting that HD cause hyponatremia and transferrable Na\(^+\) pool is partly depleted of excess Na\(^+\)\(^{[19]}\).

In the present study mean serum chloride level in post –HD pts was low compared to pre HD pts. A study by Kirschbaum B\(^{[14]}\) shows that mean serum chloride level in post HD patients (Mean-100) was low compare to pre HD patients (Mean-103).

**Conclusion**

There is decrease in s. urea besides creatinine level between period before and after hemodialysis, also s. K\(^+\) level decreased after hemodialysis. Although serum sodium and chloride levels not significantly affected after hemodialysis.
Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

Funding: Self-funding

References


Retinoic Acid Teratogenicity in Mouse Embryo

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Abstract

The present study was designed to explore furthermore the relationship between abnormalities in mice which were used as a model to study the (NTDs) in human beings and retinoic acid. The study was conducted on the Swiss white mice, with 40 females and 10 males. Females that have the vaginal plug are isolated in separate plastic cages to study the teratogenic effect of retinoic acid in the concentration of 15, 25, 35 or 45 mg/kg live body weight which were administered intraperitonially. Also, folic acid was used with dose 35mg/kg to test the preventive effect against neural tube defects. Retinoic acid doses of 15 mg/kg, 25 mg/kg and 35 mg/kg caused different abnormalities in percent of 20% including (Small size with unclear face, NTDs), 32% including (NTDs, prolonged embryos and deformation eye and ears), 68% including (NTDs, prolonged embryos and deformation eye and ears and small size) respectively. While the dose of 45 mg/kg caused 100% reabsorption.

Keywords: Neural tube defects, Spina bifida, Exencephaly, Retinoic acid, Teratology.

Introduction

Neural tube defects are the most common congenital malformation in the central nerves system in human beings(1). The etiology is complex with environmental and other genetic factors which have significant contribution(2). There are two type of NTDs open which are common and closed. In human being the 19th day of gestation the neural plate lengthened and edges of the cranial region start to rise,forming the neural groove in the middle . The edges of folds meets and fuse . The cranial neuropore is closed on day 25 and the caudal neuropore is closed on day 27 (³).

In mice model the two types of NTDs can occur together or separately. Numerous chemical agents that may inducenueral tube defects in human beings and other experimental organism, in contrast, some agents are known as preventive agent against NTDs like folic acid. Folic acid is required for new cell growth, particularly for nucleic acid and protein synthesis. It is vital for embryos developments(4). Folate deficiency was directly related to cases of neural tube defects.Many studies have shown the supplementation of folic acid before pregnancy can reduce risk of NTDs about 70%(5). The present study was designed into two tier first to study the teratogenic effect of retinoic acid on development of neural tube in mice and the protective effect of folic acid against teratogenic effects of retinoic acid.

Material and Method

The current study was conducted on 50 Swiss white mouse,with 40 females and 10 males, average age was 8-14 weeks, and average weighted was(27 ±2) g for females and (30 ±2) g for males. Mice were obtained from the Cancer Research Center/Al- Mustansiriya University. These animals were placed in special plastic cages, with dimensions of approximately, (13×16×30) cm with sterilized water bottles. The cages are sprayed with wood shavings chips, which are replaced twice a week with care for the cleanliness and sterilization of cages(6). During the study period the environmental conditions were under control . The temperature was
maintained at 24±2 C°. During the period of the study the mice were fed the appropriate ration food with serialized water ad libitum.

Females were assigned for fertilization in a ratio of 1 male/2 females in each cage during the night hours. Next morning females were checked for presence of vaginal plug. Females that have the vaginal plug are isolated in separate plastic cages. Another group of females were assigned for folic acid treatment, females were given 0.002 mg orally on daily bases for one month before fertilization(7). Females who have not been fertilized, used again and they are re-checked for presence of vaginal plug every 12 hours. Followed by the first day of pregnancy, pregnant females were divided into two groups, RA-treated groups and RA + folic acid treated. RA-treated groups divided into 4 subgroups. In subgroup A, B, C and D, on 8th day pregnant mice were administered retinoic acid intraperitoneally in concentrations of 15 mg/kg, 25 mg/kg, 35 mg/kg or 45 mg/kg. Mice received folic acid one month before pregnancy were treated with 35 mg/kg retinoic acid on day 8th of gestation, while control received only distilled water.

The mice were killed on the 18th day of gestation by cervical dislocation. The uterine horns were opened and examined for evidence of fetal death or reabsorption. Embryos were examined externally for any abnormal embryos. For the histological study embryos fixed with natural buffer formalin for 72 hours, the embryos were washed with ethyl alcohol for 70% several times, then dehydration with ascending concentration of ethyl alcohol, clearing, infiltration, embedding in paraffin wax and cut with thickness 5mm and staining with Hematoxylin – Eocene. Finally tissue section were photographed using microscope equipped with an imaging machine.

Results and Discussion

Relationship Between Retinoic acid and Abnormalities

Neural Tube Defect: The relationship between retinoic acid and neural tube defects was highly significant ($x^2$, df, $\alpha = 0.001$) = 17.702. Injection of retinoic acid into pregnant females mice on day 8th of gestation induced defects, at the dose of 15 mg/kg, and the frequency of neural tube defects increased with increasing RA doses to 25 mg/kg and 35 mg/kg, the percentage of NTDs were 28.6% and 61.9 respectively. In all vertebrate, including humans being, the vast majority of the anterior-posterior (AP) axis malformation, which is integral to the central nervous system, is characterized by various form of spina bifida grouped under the general term of NTDs(8). This concept indicates that during neurulation, the primary defects occur, leading to neural tube malformation, NTDs could be observed at all points along the (AP), whereas the most frequently occurring position is the caudal section. Due to the teratogenic potential of retinols and the crucial role of their receptors in the development of embryos, embryopathy due to retinoic acid is intensively investigated.

Spina Bifida: There is a significant relationship between retinoic acid and spina bifida incidence ($x^2$, df, $\alpha = 0.006$) = 10.317. The result showed high incidence of spina bifida with increasing dose concentration of retinoic acid on day 8th of gestation. The result, showed a high percentage of spinabifida for dose 25 and 35 mg/kg which were 33.3% and 66.7%, respectively. While the injection with 15 mg/kg RA did not induced spina bifida.

Spina bifida defects are severe and complex disease of the central nervous system in human being and other experimental animals such as mouse and rat. The high prevalence of spina bifida in infants has been reported in mother treated with high dose of retinoic acid (9). It is still difficult to treat the neurological disorders in spite of increasing the awareness and reduced the incidence due to taken food supplement of folic acid(10).

Exencephaly: There is a significant relationship between retinoic acid and exencephaly ($x^2$, df, $\alpha = 0.19$) = 7.953, the result showed high incidence of exencephaly for dosage of retinoic acid when increased in concentration. The injection of retinoic acid with different concentration into pregnant mice on day 8th of pregnancy induced exencephaly with different percentages. The high percentage of exencephaly was at dose 25 mg/kg and 35 mg/kg, were 10.5% and 38.5%, respectively. While the injection of retinoic acid with 15 mg/kg did not induced any a anomalies.

It was hypothesized that dysraphic disorders could be caused by impairment of growth in the development and progressive elevation of neural folds. Nonetheless, several reports suggested the development deficiency and progressive with elevation of the neural folds is also caused by the negative effects on the neuroepithel(11).

Folic acid: The result showed females received 0.002 mg/day of folic acid for one month before
fertilization decrease the impact of retinoic acid effects on pregnancy. The chi-square analysis showed no relationship between retinoic acid and the incidence of NTDs, when folic acid administered one month before fertilization.

The percentage of neural tube defects within the total abnormalities, for retinoic acid was 86.7% for the treatment of retinoic acid 35mg/kg, while the NTDs were reduced to 13.3% when folic acid was administered to females mice one month before fertilization. Folic acid is an important coenzyme in the normal synthesis of purine and methionine and many other biochemical reaction including single-carbon transfer. Folic acid role is to pass one unit of carbon, which is in amino acid metabolism and nucleate acid biosynthetic purine-pyrimidine. (12) Folic acid can speed up the cells separation during neural tube closure (13).

Histological Examination

Histological Examination of Control: Histological examination sequential sections which showed differentiate the forefront of the brain and differentiate the epithelium of the brain wall into three layers. There are ependymal layer followed by mantle layer after marginal layer. As for spinal cord, it is evidently integrated in elongated central canal and differentiation of gray and white matter.

Histological Examination 15mg/kg of Retinoic acid Brain: Results of histological examination showed no change in the brain tissues (Figure1). A completes differentiation of the brain and differentiation of the brain nerve with differentiation of the brain wall into three layer, which are Ependymal layer followed by mantle layer then marginal layer which represented the white mater.

Figure (1): Histopathological photograph the normal structure of the mouse head on day 18th of gestation brain (B), skull (A)

Spinal cord: The spinal cord is elucidated with the clarity of the elongated central canal. The differentiation of the substance and the gray and white matter. This results match the results of control (Figure 2). Therefore, appearance of embryos malformation depended on the dose of retinoic acid. This results are in agreement with findings of the(14).
Histological Examination 25 mg/kg of Retinoic acid: Although the external examination of embryos showed malformation, but the histological examination did not show any significant change or any damage at concentration 25 mg/kg of retinoic acid. The embryonic histological examination is therefore identical to the control.

Histological Examination 35 mg/kg of Retinoic acid: Histological examination of embryos exposed to 35 mg/kg of retinoic acid injected on day 8th of gestation, obvious change in the tissue showed; Brain

The exam showed absence a large part of the brain, and skull bones. Three layers surrounding the brain, disappeared as well as white and gray matter with lack of skin of the skull (Figure 3).

Figure (2): Histopathological photograph of normal structure of the mouse spinal column on day 18th of gestation spinal column (A), vertebrate (B) and skin (C).

Figure (3): Histopathological photograph of incomplete of the brain (A) skull bone deformity (B).
**Spinal cord:** The exam showed defects in spinal cord (incomplete). The fluid is collected into the spinal canal resulting in expansion of the canal (Figure 4). In addition to that, there are distortion in the distribution of gray and white matter with evident of tissue necrosis.

**Histological Examination (35 mg/kg Retinoic acid + Folic acid):** The histological examination of embryos exposed to 35 mg/kg of retinoic acid showed no change in comparison with control (Figure 5). These study is in agreement with (15).
Abnormalities External: The result showed the injection of pregnant mice with retinoic acid on day 8th of gestation with 15mg/kg caused 20% abnormalities out of 20% abnormalities 66% were small size and length, with unclear face appearance, 34% showed neural tube defects, while 80% of the embryos is similar to that control group. The average weight, length body, tail are 0.79g, 18 mm and 10 mm respectively

While the study showed that injection of pregnant mice with RA on day 8th of gestation with concentration of 25mg/kg induced abnormalities of mice embryos. The percentage of abnormalities was 32%. The average weight, length body and tail were 0.74 g, 17.11mm and 9.5mm respectively, while in control were 0.89 g, 18.79mm and 10.5mm respectively. Out of total abnormalities of 32%, 40% showed spina bifida with limb deformity including 20% anencephaly, 20% prolonged embryos and deformation eye and small ears, 20% severe cured.

In addition to that mice treated with retinoic acid with concentration of 35mg/kg on day 8th of gestation induced significant abnormalities of mice embryos, the percentage of abnormalities was 68%. The average of body weight, body length and tail length were 0.7 g, 17 mm and 8.5 mm respectively, in comparison to control, were 0.89 g, 18.79 mm and 10.5mm respectively. Total abnormalities was 68%, 40% of these abnormalities were spina bifida and limbs deformity including 20% was exencephalic embryos. Prolonged embryos and deformation of eyes and small ear represent 20%, whereas trunk deformity represented 20%. Maternal treatment with a retinoic acid on day 8th of gestation in mice, results in the production of brain and spinal cord anomalies with a varying degrees of severity frameshifted.

Group Treated with 35 mg/kg of Retinoic Acid+ Folic Acid: Females were treated with folic acid in concentration of 0.002 mg/daily for one month before fertilization, and received a dose of retinoic acid of 35 mg/kg on day 8th of pregnancy showed reduced the neural tube defects. Recent clinical studies have shown that the supplementation of folic acid before conception and during the first month of pregnancy can prevent a substantial proportion of NTDs. Studies that followed these trials showed that the first occurrence of NTDs is also reduced by about 60%. In the United States in 1993 Public Health Service advised all women of child-bearing age who are qualified for becoming pregnant should take 0.4 mg/day of folic acid

In conclusions, All doses of retinoic acid caused abnormalities but the percentage increased with increasing the dose of retinoic acid. While Folic acid has inhibitory effect on the teratogenic agent (RA) when it was given to the pregnant mice one month before pregnancy.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest. Funding: Self-funding

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Dipeptidyl Peptidase 4 in Women with Polycystic Ovarian Syndrome

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Abstract

Background: Polycystic ovary syndrome (PCOS) is the most prevalent reproductive endocrinopathy and currently considered to be a part of the metabolic syndrome. Women suffering from PCOS present with a group of symptoms related with menstrual disorder and androgen excess. Women with PCOS cluster risk factors associated with risk of insulin resistance, dyslipidemia, hyperandrogenemia, obesity, cardiovascular disease (CVD), infertility, and psychological disorders. Objective: The study was designed to determine the levels of DPP4 in PCOS patients and compared with control and study the correlation with biomarkers in serum of PCOS patients.

Subjects and Method: The study is case-control included 80 females and carried out from February 2019 till May 2019 for females in the reproductive age [18-45 years old], forty females were came from gynecological and obstetric hospital, in Karbala, and they all diagnosed by their physicians have polycystic ovarian syndrome and compared with forty control females [healthy females]. Plasma activity of DPP4 and biochemical variables were performed.

Results: Results obtained in this study showed that there are significant differences (p < 0.05) in serum of DPP4, SHBG, DHEA-S, LH, FSH, free testosterone and total testosterone and there is positive significant correlation between DPP4 with free testosterone, SHBG, DHEA-S, LH and total testosterone.

Conclusion: Polycystic ovarian syndrome is a higher risk of type 2 diabetic mellitus, dyslipidemia and cardiovascular diseases, Dipeptidyl peptidase 4 (DPP4) was high in PCOS patient and had positive correlation with free testosterone, total testosterone, DHEA-S, SHBG and LH.

Keyword: Polycystic, Dipeptidyl, DPP4, (PCOS).

Introduction

Polycystic ovary syndrome (PCOS) is a female endocrine disorder featuring elevated concentrations of androgen, ovulatory dysfunction1, it prevalence ranges from 9% to 18% in reproductive-aged women based on definitions and populations studied, it is associated with reproductive, (menstrual irregularity, infertility and pregnancy complications), metabolic (metabolic syndrome, type 2 diabetes (T2D) and cardiovascular disease (CVD) and psychological (anxiety and depression).2.

Dipeptidyl peptidase4 (DPP4) or (CD26), is a 110kDa glycoprotein expressed ubiquitously on the surface of different cell 3 Soluble DPP4 (sDPP4) was regarded as a novel adipokine, It is involved in the catalytic degradation of glucagon like peptide-1 [GLP-1], which suggests main function in metabolism3, GLP-1 stimulates insulin secretion and suppresses glucagon secretion, GLP-1 also controls gastric emptying, body

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weight in relation to its impacts on glucose homeostasis. Inhibition of DPP4 results in increased concentrations of active GLP-1 and subsequent improvement of insulin release i.e. Vildagliptin increases insulin release rather than increase insulin sensitivity.

**Materials and Method**

The case control study carried out from February 2019 till May 2019 of a total number of 80 females within the reproductive age (18 to 45 years old). forty cases females out of 80 were attended from gynecological and obstetric hospital in Karbala province, and they all diagnosed by their physicians as Polycystic Ovarian Syndrome, (depending on clinical, biochemical and Rotterdam criteria), and they were compared with forty healthy control women.

**Inclusion Criteria:** All PCOS patients have already been diagnosed and the diagnosis has been confirmed by the European human reproduction society and embryology and American society for reproductive medicine criteria.

**PCOS is diagnosed if there are any two of the following:**

- Presence of PCOS on ultrasound examination.
- Menstrual disorders with an ovulation.
- Clinical or biochemical hyperandrogen.

**Exclusion Criteria:**

- All Patients with history of medical condition
- Other disorders that may affect menstrual regularity and hyperandrogenism such as thyroid dysfunction, and pituitary disease that related with hyperprolactinemia.

**Collection of Sample:** Blood specimens were collected; 5 ml venous blood samples were taking during 2nd – 5th day of the menstrual cycle (early follicular phase) for those of normal cycle. For patients with anovulation or oligomenorrhea blood sample were collected regardless of duration of the cycle. Blood samples were left for 20 minutes at room temperature. After coagulation, the serum was separated via centrifuge at (3000 run per minute) for five min., hemolysed samples were discarded. Sera were stored and frozen at - 40°C until analysis.

**Determination of Human Dipeptidyl Peptidase IV (DPP4) Principle:** This ELISA kit uses the Sandwich-ELISA principle. The micro ELISA plate provided in this kit has been pre-coated with an antibody specific to Human DPP4.

Standards or samples are added to the micro ELISA plate wells and combined with the specific antibody.

Then a biotinylated detection antibody specific for Human DPP4 and Avidin-Horseradish Peroxidase (HRP) conjugate are added successively to each micro plate well and incubated. Free components are washed away.

The substrate solution is added to each well. Only those wells that contain Human DPP4, biotinylated detection enzyme-substrate reaction is terminated by the addition of stop solution and the color turns yellow.

The optical density (OD) is measured spectrophotometrically at a wavelength of 450 nm ± 2 nm.

The OD value is proportional to the concentration of Human DPP4. You can calculate the concentration of Human DPP4 in the samples by comparing the OD of the samples to the standard curve.

**Detection range (0.31-20 ng/ml)**

**Results**

A total number of 80 women were taken with age ranged between (18-45) years and divided into 40 infertile PCOS females with and 40 healthy control females, The diagnosis depends on biochemical features (raised LH, LH/FSH ratio and/or increased testosterone, decrease FSH); clinical features include irregular menstrual cycle, hirsutism, and obesity. PCOS has been confirmed by ultrasound.

Comparison between polycystic ovary syndrome cases group and control group in the parameters measured:

The results obtained in this study showed that there is a no significant difference (P >0.05) in FSH and BMI while the results showed that there a significant difference (p< 0.05) in serum total testosterone, free testosterone, SHBG DHAES, LH and DPP4 as shown in table (1):
Table (1): Biochemical parameters in patients with polycystic ovary syndrome compared with control group.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Patient group N= 40 Mean ± SD</th>
<th>Control group N= 40 Mean ± SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI (kg/m²)</td>
<td>27.57 ± 3.73</td>
<td>27.8 ± 5.28</td>
<td>NS</td>
</tr>
<tr>
<td>DPP4 (ng/ml)</td>
<td>3.37 ± 0.55</td>
<td>1.93 ± 0.19</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>SHBG (pmol/ml)</td>
<td>30.58 ± 3.15</td>
<td>23.55 ± 1.51</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>DHEAS (ng/ml)</td>
<td>83.02 ± 9.87</td>
<td>61.73 ± 5.01</td>
<td>P&lt;0.001</td>
</tr>
<tr>
<td>Total testosterone (ng/ml)</td>
<td>0.69 ± 0.021</td>
<td>0.26 ± 0.014</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>LH (m.lu/ml)</td>
<td>13.73 ± 0.63</td>
<td>9.93 ± 0.31</td>
<td>P&lt;0.001</td>
</tr>
<tr>
<td>FSH (m.lu/ml)</td>
<td>6.81 ± 0.34</td>
<td>8.85 ± 0.69</td>
<td>NS</td>
</tr>
<tr>
<td>Free testosterone (pmol/ml)</td>
<td>30.51 ± 1.66</td>
<td>19.69 ± 0.89</td>
<td>P&lt;0.05</td>
</tr>
</tbody>
</table>

Correlation between DPP4 with biochemical parameters in patient.

The results of linear regression analysis show significant positive correlation in serum DPP4 concentration with free testosterone, total testosterone, LH, SHBG and DHEA-S as shown in table (2):

Table (2): Correlation between DPP4, DHEA and SHBG with biochemical parameters in patient.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>DPP4</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI (kg/m²)</td>
<td>r = -0.003 \ p = 0.979</td>
</tr>
<tr>
<td>Free testosterone (pmol/ml)</td>
<td>r = 0.375** \ p = 0.01</td>
</tr>
<tr>
<td>Total testosterone (ng/ml)</td>
<td>r = 0.319** \ p = 0.04</td>
</tr>
<tr>
<td>LH (m.lu/ml)</td>
<td>r = 0.222* \ p = 0.04</td>
</tr>
<tr>
<td>FSH (m.lu/ml)</td>
<td>r = 0.038 \ p = 0.739</td>
</tr>
<tr>
<td>SHBG (pmol/ml)</td>
<td>r = -0.25* \ p = 0.02</td>
</tr>
<tr>
<td>DHEA-S (ng/ml)</td>
<td>r = 0.22* \ p = 0.04</td>
</tr>
</tbody>
</table>

Figure (1): The correlation of serum levels of DPP4 (ng/ml) with free testosterone (pmol/ml) in the patient group.
Figure (2) The correlation of serum levels of DPP4 (ng/ml) with total testosterone (ng/ml) in the patient group.

\[
\begin{align*}
\gamma &= -0.0031x + 0.7319 \\
R^2 &= 0.0132
\end{align*}
\]

Figure (3) The correlation of serum levels of DPP4 (ng/ml) with LH (m.lu/ml) in the patient group.

\[
\begin{align*}
\gamma &= -0.0986x + 15.529 \\
R^2 &= 0.0203
\end{align*}
\]
Figure (4) The correlation of serum levels of DPP4 (ng/ml) with SHBG(pmol/ml) in the patient group

Discussion

Polycystic ovarian syndrome (PCOS) is the most prevalent endocrinopathy of females of reproductive age. PCOS is a heterogeneous disease it impacts at 7 percent of females, According to the National Institutes of Health Office for Disease Prevention 4.

The three main prevalent factors connected with PCOS involve ovulation irregularities, enhanced concentrations of androgen, and cystic ovaries, ovulation problems and high levels of androgen happen in the majority of females with PCOS, in addition, hirsutism, menstrual irregularity, acne, and alopecia are immediately associated with high androgen levels, and the incidence of polycystic ovaries in pelvic ultrasound exceeds 70% in PCOS patients 4.

In this present study, there was a significant increase in the mean of DPP4 when compared patient with control groups at p < 0.05, this results is agreement with the result of 5.

These result indicated that a deregulation of level of DPP4 might be extra feature of the metabolic inequalities related with PCOS, Although PCOS was well defined as IR and hyperandrogen, DPP4 was not different in this group. However, a connection between DPP4 and markers of IR were found 6.

Dipeptidyl peptidase 4 inactivates both incretin hormone (GIP, GLP-1), leading to high blood glucose and insulin resistance, therefore DPP4 inhibitors are used in the treatment of type 2 diabetes several previous studies demonstrating strong association of the syndrome with IR, more than half of patients with PCOS had IR.

DPP4 inhibitors can help patients with diabetes decrease IR, reduce glycosylated hemoglobin androgen levels also correlate positively with IR in PCOS patients because hyperandrogenism induces IR by reducing insulin clearance and increasing lipoprotein lipase activity and triacylglycerol release Compensatory hyperinsulinemia in turn further aggravates hyperandrogenism SHBG lowers free androgen levels by binding free androgens to alleviate hyperandrogenism and IR 7.

The presented study indicate that serum SHBG was a significant decrease in the mean SHBG when compared patients with control group at p < 0.05.

Our results are in accordance with the previous
work done by $^{8-10}$. Who showed that hyperandrogenism carried a significant risk of hyperinsulinemia due to stimulation of ovarian androgen secretion and inhibition of hepatic SHBG production and this results agree with inverse positive correlation between DPP4 and SHBG, figure (4).

The results in table (1) show a significant increase differences in DHES when compared patients with control group compared at p < 0.001.

These results were in agreement with some previous studies$^{11-13}$

Who showed the abnormally high levels of DHEA-S occur in about 20-30% of women with PCOS.

One explanation for elevated DHEAS levels in PCOS might be found in an altered cortisol metabolism. In particular, it has been shown that the peripheral metabolism of cortisol is increased in PCOS due to the enhanced inactivation of cortisol by 5a-reductase or impaired reactivation of cortisol from cortisone by 11b-hydroxysteroid dehydrogenase type 1. This could lead to a decreased negative feedback on ACTH, resulting in increased pituitary adrenal axis activity, including androgen synthesis to maintain normal cortisol levels. Moreover, increased peripheral sulfatase activity has been observed in women with PCOS, which might increase circulating DHEAS levels.

The results of the present study showed a statistically significant positive correlation between DPP4 with DHEA-S.

The results in table (1) show a significant increase differences in total testosterone and free testosterone when compared patients with control group compared at p < 0.05.

Our results are in accordance with the previous work done by $^{14-17}$

Several Studies showed that women with diabetes had higher level of free testosterone comparing women without diabetes. therefore, reduction in the sex hormone binding globulin (SHBG) and high levels of free testosterone are accepted for the occurrence of diabetes type 2 and highlights the relationship between androgens and insulin sensitivity.

Hyperinsulinemia could result in hyperandrogenism by increasing androgen production, decreasing androgen catabolism, or increasing the tissue availability of T by decreasing serum SHBG levels $^{18}$

The results of the present study showed a statistically significant positive correlation between DPP4 with total testosterone figure (1), this is agreement with the finding of studies, and between DPP4 with free testosterone, figure (2). This is in agreement with In this study on case groups when compared with the control groups, found a significant difference in the concentrations of LH hormone p < 0.05 and no significant with FSH $^{19}$ observed that elevated LH and LH to FSH proportion, 75% of PCOS females had an increased LH concentration and 94% increased LH to FSH proportion. These finding is similar to finding of $^{20}$ indicated the plasma LH concentration for females with PCOS is increased. Similar results were found in a study done by $^{21}$ who showed that PCOS females had greater concentration of serum LH than normal females.

The data of the current study showed that there is positive significant correlations between serum DPP4 with LH, figure(3), this result agreement with 6 therefore several studies demonstrated that DPP4 inhibited androgen production by theca cells and also suggested that DPP4 inhibitors reduces pituitary luteinizing hormone and increases the production of SHBG

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

**References**


CT Scan Parameters as Predictor of Ureteric Stone Impaction and Ureteric Injury Post Laser Lithotripsy

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Abstract

Introduction: Renal stone are little, firm deposit inside kidney, the stone consist from acid salts and minerals so the stone form in the urinary system it considered the most common reasons of sudden renal colic, Ureterorensoscopic lithotripsy (URS) for removal of stone is considered optimum procedure for patients suffer from renal stones.

Aims: To Study the relation of CT parameters in stone patients and determine which parameters are the valuable in prediction of the Surgical outcome).

Patient and Method: A prospective study conducted of 20 patients with ureteric stones, followed up in urology consultation unit, Data collected from theater room determined by surgeon were: Stone impaction, iatrogenic injury, DJ use. Data collected from CT imaging were Stone number and side, Stone site, Stone diameter, Tissue rim sign, Degree of hydronephrosis and Stone hounsfield unit.

Results: The collected data showed male (60%) predominance over females (40%) The commonest age group was 30-39 years (30%) The results showed that (70%) of stones lies in one ureter but without any correlation with surgical outcome. Regarding Stone Diameter our study showed (20%) of patients with stones >10 mm in axial image all had impacted stones. Regarding Tissue Rim sign >2.5 mm at level of stone site correlate with impaction and injury. Moderate/sever degree of hydronphrosis correlate with impaction and injury.

Conclusions: CT parameters that had strong relation to the surgical outcome in regard of stone impaction and intraoperative iatrogenic injury.

Keywords: CT scan, ureteric stone impaction, ureteric injury, post laser lithotripsy.

Introduction

Renal stone are little, firm deposit inside kidney, the stone consist from acid salts and minerals so the stone form in the urinary system it considered the most common reasons of sudden renal colic, so this type of stone affect any part of urinary system and it formulated when concentrated urine this lead to crystallization of minerals and fuse together, this concentration occur due to mild to severe dehydration. The incidence is raise to about 13% in male and 7% in female at same point. When stone pass from kidney to ureter this lead to shout acute pain but without any tissue damage but the trauma occur due to pain and lead to pass blood, clots, fragments of stone considered so painful. Site of stone inside ureter (near, middle and away) have effect on stone movement and passing. Shock-wave lithotripsy (ESWL), laparoscopic ureterolithotomy, antegrade percutaneous method are management options but the usual management is URS for remove stones. URS

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for removal of stone is considered optimum procedure for patients suffer from renal stones. ESWL and URS are together have 80% of success rate. Stone of equal or less than 1 cm ESWL more accurate than URS in stone removal (90% vs 80%), stone of equal or more than 1 cm URS more accurate than ESWL in stone removal (68% vs of 79%). Imaging, therefore, has become an increasingly important tool in the evaluation of patients with flank pain. Before URS all patients most undergo abdominal and pelvic CT scan for evaluation urinary tract CT scan used without contrast and even so the anatomy of urinary tract well show. ¼ of patients with normal radiological findings when examine by Intravenous urography (IVU) show stones. So CT scan more reliable than IVU if there is obstruction when many films need to obtain with little radiation dose, also CT scan useful in diagnose other causes of pain especially AAA (abdominal aortic aneurysm). CT is as simple as passing X-rays through the patient and obtaining information with a detector on the other side. Owing X-rays absorption difference, different tissues seem different when the X-ray film is developed.

Patient and Method

A prospective study involving 20 cases, in the period between 10th of August 2017 to 20th of January 2018, were followed up in urology consultation unit, urology Surgical theater and CT department in Al-Imamein Al-Kadhimein medical city, after which non enhanced CT were done and taken as 1mm thickness films in same hospital by Seimens SOMATOM. The ureteroscopic procedure was done under general or regional anesthesia in lithotomy position. Astiff cystoscopy was done to find ureteric opening and progression of hydrophilic directorwire below fluoroscopic supervision into the renal pelvis or outside the level of calculus. A 6- 7.5 F semi stiff ureter scope (Karl Storz) used for lithotripsy ureter scope. Ureter scope put away to stone, we used for lithotripsy holmium laser (550um) with frequency 8-10 HZ, electrical supply 9.6-16 W AT. Stone was split and recovered and so small fragments were gone for impulsive pass. Dual J implanted when indicated or precausiously. Foley catheter was placed post operatively if needed. After consent have been taken from patient, patient been followed up and surgical parameters were taken as determined by the surgeon (impaction, DJ indication and ureteric injury). CT parameters was optained using Sante DICOM viewer v5.3. Stone site was classified as proximal ureter (above the sacroiliac joints), mid ureter (overlying the sacroiliac joints), distal ureter (below the sacroiliac joints). Stone size was defined as the maximum diameter within the plane of the axial CT section. Hydronephrosis detemrisn using “Society of Fetal Ultrasound, SFU” hydronephrosis grading system, the most common used system. A positive tissue rim sign (periureteric fatstrands) was defined as annular soft tissue attenuation (20 to 40 Hounsfield units) caused by an edematous ureteral wall surrounding the stone. Hounsfield Unit was omitted from CT parameters due to overlap of ranges and different HU in different parts of the stone. This study involved 20 patients, of them 12 were males and 8 females, their ages ranged from 16 to 69 years old, only two stones passed spontaneously and required no intervention, one ureteroscopic procedure was turned to laparotomy. Statistical analysis were used SPSS 23, mean, SD and percentage used for descriptive analysis. For analysis of variables and data we used independent T test for continuous independent data while used Fisher’s exact for categorical data. So P-value < 0.05 mean significant statistically.

Results

Prospective study involving 20 patients; 12 (60%) male 8 (40%) female, most common age group are thirties constituting 30% with mean age 42±15 years old. So (70%) of calculi in the study group lies in one ureter. In regard to stone Diameter 16 (80%) of the study group were less than 10 mm, and only 4 (20%) were equal or larger than 10 mm. Tissue rim sign surrounding stones were found to be less than 2.5 mm in the axial section in 14 (70%) of the cases and only 6 stones (30%) surrounded by more than 2.5 mm edema. Mean was 2.11 mm with standard deviation of 0.979. eleven stones (55%) were having HU less than 1300, while 45% having more than 1300 HU. Most common group associated with stones is mild (grade I, II) comprising 40% of the study group. Stone impaction is noticed in 35% while 10% passed spontaneously with no further management, 55% was not impacted but still required lithotripsy. 60% with no injury after laser lithotripsy and 40% with injury.

Results

There was no impact of age on stone impaction (P-value of 0.553). Stone impaction is not affected by the gender difference with P-value equals 1. When comparing the effect of one stone or more than one on impaction we noticed that there is no significant
correlation with P-value of 0.626, regarding effect of stone side whether in one or both ureters on impaction also was found to be insignificant with P of 0.354. number of stones found to be uncorrelated to risk of ureteral injury with p value of 1. No correlation was significant with P value of 0.62 indicate that no effect of stone site on the iatrogenic injury rate. Within population of 20 patient, 80% of them had stones <10mm in diameter of those 15% where impacted, while the other 20% of patients with stones more than 10mm all had impacted stones, P-value was 0.0072 which aided the significant correlation that state: stone diameter >10mm in axial section provide perfect toll for suggesting impaction of stone, as shown in table 1.

Table 1: Stone diameter as predictor of ureteral stone impaction.

<table>
<thead>
<tr>
<th>Maximum diameter in mm</th>
<th>Passed spontaneously no/%</th>
<th>Not impacted no/%</th>
<th>Impacted no/%</th>
<th>Total no/%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 to 10.00</td>
<td>2/10</td>
<td>11/55</td>
<td>3/15</td>
<td>16/80</td>
</tr>
<tr>
<td>10.01 to 20.00</td>
<td>0/0</td>
<td>0/0</td>
<td>4/20</td>
<td>4/20</td>
</tr>
<tr>
<td>Total</td>
<td>2/10</td>
<td>11/55</td>
<td>7/35</td>
<td>20/100</td>
</tr>
</tbody>
</table>

Stones that are associated with Tissue Rim sign <2.5mm were 70% of our study group, halve of those stones were not impacted, on the other hand those associated with Tissue Rim sign >2.5mm, 25% of them had stone impaction, P value was 0.0128 which state that the diameter of Tissue Rim is strong indicator for impaction, as shown in table 2.

Table 2: Tissue rim sign as predictor of ureteral stone impaction.

<table>
<thead>
<tr>
<th>Tissue Rim sign in mm</th>
<th>Passed spontaneously no/%</th>
<th>Not impacted no/%</th>
<th>Impacted no/%</th>
<th>Total no/%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less or equal 2.5</td>
<td>2/10</td>
<td>10/50</td>
<td>2/10</td>
<td>16/80</td>
</tr>
<tr>
<td>More than 2.5</td>
<td>0/0</td>
<td>1/5</td>
<td>5/25</td>
<td>4/20</td>
</tr>
<tr>
<td>Total</td>
<td>2/10</td>
<td>11/55</td>
<td>7/35</td>
<td>20/100</td>
</tr>
</tbody>
</table>

It was found that tissue rim sign around stone <2.5 mm associated with no injury in 55% of the study group, those with edema>2.5mm, had injury of different degrees, P value was 0.0181 which state that tissue rim sign more than 2.5mm is strongly associated with ureteric injury, as shown in table 3.

Table 3: Tissue rim sign as predictor of ureteral injuries.

<table>
<thead>
<tr>
<th>Tissue Rim sign in mm</th>
<th>No Injury no/%</th>
<th>Mucosal injury no/%</th>
<th>Muscular injury no/%</th>
<th>Turn to laparotomy no/%</th>
<th>Total no/%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less or equal 2.5</td>
<td>11/55</td>
<td>2/10</td>
<td>1/5</td>
<td>0/0</td>
<td>16/80</td>
</tr>
<tr>
<td>More than 2.5</td>
<td>1/5</td>
<td>2/10</td>
<td>2/10</td>
<td>1/5</td>
<td>4/20</td>
</tr>
<tr>
<td>Total</td>
<td>12/60</td>
<td>4/20</td>
<td>3/15</td>
<td>1/5</td>
<td>20/100</td>
</tr>
</tbody>
</table>

In those with no or mild hydro nephrosis according to SFU system, 0% had stone impaction, while 35% of those with moderate to severe degrees of hydro nephrosis had impaction, P value was 0.0013 which signify and state that degree of hydro nephrosis correlate with the state of stone impaction, as shown in table 4.

Table 4: Degree of hydro nephrosis as predictor of ureteral stone impaction.

<table>
<thead>
<tr>
<th>Degree of Hydro nephrosis</th>
<th>Passed spontaneously no/%</th>
<th>Not impacted no/%</th>
<th>Impacted no/%</th>
<th>Total no/%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Hydro nephrosis</td>
<td>0/0</td>
<td>4/20</td>
<td>0/0</td>
<td>4/20</td>
</tr>
<tr>
<td>Mild (grade I,II)</td>
<td>2/10</td>
<td>6/30</td>
<td>0/0</td>
<td>8/40</td>
</tr>
<tr>
<td>Moderate (grade III)</td>
<td>0/0</td>
<td>1/5</td>
<td>4/20</td>
<td>5/25</td>
</tr>
<tr>
<td>Sever (grade IV)</td>
<td>0/0</td>
<td>0/0</td>
<td>3/15</td>
<td>3/15</td>
</tr>
<tr>
<td>Total</td>
<td>2/10</td>
<td>11/55</td>
<td>7/35</td>
<td>20/100</td>
</tr>
</tbody>
</table>
Mild and no hydro nephrosis associated with only 5% of iatrogenic injury due to ureter scope and or lithotripsy, while those with moderate to severe hydro nephrosis (according to SFU system) associated with 35% of different levels of injuries, P value was 0.0008 which aid the state that moderate and sever degrees of hydro nephrosis associated with more iatrogenic injuries.

**Discussion**

On our study of the 20 patients the prevalence of renal stones were more common in males (60%) than females (40%), in study done in southern Punjab, Pakistan were on 1176 patients with stones prevalence in males were (74%) and in females (26%)12. The high prevalence of renal calculi in males in this study can be described by the effect of sex hormones on some other lithogenic risk factors13, with no effective correlation between gender and surgical parameters, especially stone impaction. Most common age group were 30-39, which also constitutes the majority of southern Punjab study, with mean age of 41.45±14.1113 while that of our study were 42±15 with other studies near that range, one of them were in same hospital 14, with no effect of gender on surgical parameters especially stone impaction15.

In regard of stone side the result showed that (70%) were in one ureter whether one stone or more, in a study done in the same hospital in 2006 were including 184 patients, 65.8% of them were having stones in same side16, in other study for complications of laser lithotripsy showed that there were no effect of side of stone on surgical outcome15, neither our study showed any correlation. Half (50%) of stones in our study group were in the distal ureter, fifteen percent of them were impacted ureter, 46% of patient in a study done at Thanjavur medical college and hospital having stone in distal ureter, and (37%) in proximal ureter17, other study in Netherlands showed (52.5%) in distal ureter which showed also that there is no correlation of stone location to the surgical impaction or DJ use and iatrogenic injury as our results confirmed statistically17.

Stone size smaller than 1cm were noted in (80%) in our study, and (86%) in study of Thanjavur medical college, while those larger than 1cm in diameter were only (20%) in our and (14%) in their study13, never the less, outcome of our analysis result that stone diameter has direct contribution to stone impaction and ureteric iatrogenic injury. American Urological Association/Endourological Society guild line suggest that stone >10mm will mostly require surgical intervention due to impaction19, study of Utrecht medical center concluded that the stone size doesn’t affect the surgical outcome which refute our results 15. Tissue rim sign was used in other studies as a sign for stone presence or absence, never used as predictor for outcome of lithotripsy, although its absence doesn’t exclude the presence of stone20, our results showed statistical correlation between tissue rim sign>2.5mm in diameter at the level of maximum stone diameter with stone impaction and iatrogenic injury. Degree of hydro nephrosis results in our study showed that whenever there is moderate or severe degree (grade III or IV) there will be impacted stone as well as more risk to have iatrogenic injury.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding

**References**


Risk of Incident Rheumatoid Arthritis Related to Anemia and Associated with CRP

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Abstract

Background and Objective: Rheumatoid arthritis (RA) is a chronic systemic inflammatory an autoimmune disease characterized by the articular and extra-articular manifestation as weight loss, fatigue, malaise, and anemia. This study aimed to find the prevalence of metabolic syndrome in its correlation with the disease activity among patients with RA in Al-Najaf province and to determine the associated risk factors this study including 75 Subjects was 50 suffering from rheumatoid arthritis and 25 subjects were healthy. Full blood count, erythrocyte sedimentation rate platelet count was determined using standard hematologic method. The result in this study exhibits there is significant decrease in (hematological characteristic) RBC number, while increase in WBC number spatially neutrophil, platelet, glucose and ESR in patients with arthritis in comparison with control. This result indicated that no significant difference (P>0.05) in the mean hematological characteristic RBC number, WBC number spatially neutrophil, platelet when compared with between Positive and negative C –reactive protein in patient with arthritis. The results revealed a significant increase (P<0.05) in mean of ESR of patients with positive C –reactive protein in compared with negative C –reactive protein in patient with arthritis.

Conclusions: Rheumatoid arthritis patients have a variety of abnormalities in hematologic characterize. RA disease can be linked with anemia of chronic inflammation, leukocytosis, and thrombocytosis. Also, in our study, we concluded that little evidence found between disease activity and anemia. ESR and C-reactive protein related to the activity of RA disease.

Keywords: Rheumatoid arthritis, anemia, ESR and C-reactive protein.

Introduction

Rheumatoid arthritis (RA) is a common immunity and inflammatory disease the studies on RA is focused on the earliest stages of the disease and has provided strong evidence that clinical signs and symptoms may be preceded by a preclincial phase during that evidence of systemic autoimmunity may be present. This disease was developed in a series of phases. The first of these phases is suggested with the presence of risk of genetic and environmental factors. In the second phase, autoimmunities such as autoantibodies and autoreactive cells were detected in the blood; also, the study predicted that the mucosal sites are the initiation site for developing that autoimmunity. So, this autoimmunity measured in the blood by serologic or another testing inpatient that characterized by an expansion of inflammation, autoimmunity, and symptoms. Finally, inflammatory arthritis that clinically detectable classified as RA.

RA is an autoimmune disease so that the immune system inpatient starts attacking itself and causes chronic inflammation when directed against the joints that lead to the releases cytokines, chemokines, complement proteins, growth factors and, matrix metalloproteinases among others. These factors not only remain the activation of the synovial cells while also induce from of new immune cells. These immune cells can destroy the extracellular matrix of cartilage and bone, causes joint deformation.

The diagnosis of RA is not constantly clear to estimation, and patients are occasionally suffering from the symptoms of disease several years before they are
diagnosed. The classification of RA requires that patients fulfill several criteria. These were already shown in 1987 and have recently been revised and explained by the American College of Rheumatology and European League Against Rheumatism, in the 2010 Rheumatoid arthritis classification criteria.(4)

Materials and Method

This study was conducted in the Al-Sader teaching hospital in ALNajaf, Serum specimens were collected from patient with rheumatoid arthritis in addition to control group.

**Study Design:** The samples tested were (75) samples divided to control group were (25) samples and (50) rheumatoid arthritis begin from the(1 to 45) years, the age of rheumatoid arthritis patients.

**Collection of Blood Sample:** Blood samples were drawn from vein by sterilized synergies with 5 milliliters. The sample put in the labeled tube. Blood was left at room temperature for 10 minutes for clotting, centrifuged 6000 rpm for 15 minutes, and then serum was separated and freezing at -80 °C until time for performed the laboratory analysis for study.

**C-reactive protein (CRP) and serological test rheumatoid factor (RF):**

Rheumatoid factor latex serological test and C – reactive protein were measured by agglutination test

**Erythrocyte sedimentation rate (ESR):** The Westergreen method was used as described by (Cheebrough,2004). When anticoagulated blood is left to stand undisturbed for 1 hour the red cells sediment gradually to the bottom of the tube leaving clear plasma on top and the distance occupied oy the supernatant plasma is determined.

**Assessment of Complete Blood Count (CBC):** Complete blood count was conducted on anticoagulant blood utilizing Mythic™ eighteen (Ringelsn co., Turk) in Haematology Laboratory.

**Statistical Analysis:** The data were statistically analyzed through SPSS package (SPSS, Version 23) at significant P<0.05. t-test was used for comparison between two groups while multivariate ANOVA has been used for the comparison among subdivided groups in the measured parameters.

RESULT:

**Hematological Characteristics of study subject:** In this study, a total of 75 cases consisting of 50 patients with Rheumatoid arthritis and control 25 were examined. As shown in table (1),The patients had ages ranging between 1 to 55 years. As illustrated in sametable, there is significant decrease in (hematological characteristic) RBC number, while increase in WBC number spatially neutrophil, platelet, glucose and ESR in patients with arthritis in comparison with control.

<table>
<thead>
<tr>
<th>Hematological characteristics</th>
<th>Mean ± SE</th>
<th>Mean ± SE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patient N=50</td>
<td>Control N=25</td>
</tr>
<tr>
<td>RBC(10^{12}/L)</td>
<td>3.44±0.064*</td>
<td>4.691±12.525</td>
</tr>
<tr>
<td>Hb(g/dl)</td>
<td>11.77±0.167</td>
<td>12.794±.40656</td>
</tr>
<tr>
<td>WBC(10^{9}/L)</td>
<td>7.3658..38571 *</td>
<td>4.47±0.099</td>
</tr>
<tr>
<td>Neutrophil(10^{9}/L)</td>
<td>4.7558±.40894*</td>
<td>2.39±0.075</td>
</tr>
<tr>
<td>Lymphocyte(10^{9}/L)</td>
<td>2.0058±.11620</td>
<td>1.98±0.074</td>
</tr>
<tr>
<td>Platelet(10^{12}/UL)</td>
<td>294.0526±16.82877 *</td>
<td>152.54±0.45</td>
</tr>
<tr>
<td>ESR(mm/hr)</td>
<td>40.12±6.63757 *</td>
<td>12.45±0.340</td>
</tr>
</tbody>
</table>

**Comparison of the clinical characteristics between Positive and negative C–reactive protein of study subject:** Figures (1, 2, 3 and 4), explained the general characteristics of the studied groups when compared between Positive and negative C –reactive protein in patient with arthritis. This figure indicated
that no significant difference (P>0.05) in the mean (hematological characteristic) RBC number, WBC number spatially neutrophil, platelet when compared with between Positive and negative C–reactive protein in patient with arthritis. The results revealed a significant increase (P<0.05) in mean of ESR of patients with positive C–reactive protein in compared with negative C–reactive protein in patient with arthritis.

Table 2: serological test of patient

<table>
<thead>
<tr>
<th>Serological test</th>
<th>Positive test</th>
<th>Negative test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rheumatoid factor latex</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>C–reactive protein</td>
<td>42.85%</td>
<td>57.15%</td>
</tr>
</tbody>
</table>

Figure 1: Comparison of the hematological characteristics between patients with positive and negative C–reactive protein

Figure 2: Comparison of the Hb between patients with positive and negative C–reactive protein
Discussion

The result of current study showed there is significant decrease in RBC number while there is non the significant decrease in Hb mg/dl in patients with arthritis in comparison with control. The most common risk that developed in rheumatoid arthritis was Anemia which becomes less due to the newer drugs in many countries. (5) Another study suggested that rheumatologic disorders patients with hematologic abnormalities suffering from anemia of chronic disease which asymptomatic, and also iron deficiency anemia.(6,7) Though, Anemia in RA is a type of chronic disease that is often careless in clinical practice.(5) The study of Talukdar et al. (2017) was predicted that Hb is lower in patients with high activity of RA disease.(8)

The result of current study showed there is significant increase in (hematological characteristic) WBC number spatially neutrophil, platelet, and ESR in patients with arthritis in comparison with control. The current study
agreement with result of Ismail et al. (2020) study(9) which revealed that RA patients had significantly higher in the count of WBCs, Neut. cells, ESR, RF,CRP and Creatinine in comparison with HCs while levels of HDL and Hb were slightly lower in patients with RA than in the HCs.

This results supported the previous observations which speculate that the white cell counts, lymphocytes percentages, and thrombocytes have a significant increase in RA patients contrasted with controls subjects. Cascão et al.,(10) corresponded with current investigations in that the white blood cell assumes an essential role in the RA initiation. Truth be told, polymorph nuclear leukocytes are the abundant leukocytes in the patient’s synovial fluid, then in the early stage of discuses, the polymorph nuclear leukocytes indicate altogether bring downapoptosis levels (11).

While other study suggested that Anaemia was common at RA diagnosis with neutropenia and lymphopenia. This study also developed a concept that the lymphopenia and anemia linked with elevated the risk of infection in RA patient.(12)

Our outcomes additionally uncovered thrombocyte levels increased related to all patients suffering from inflammation of the rheumatoid joint. Gasparyan et al.,(13) have suggested that in RA the thrombocytosis and thrombocytes-inferred proteins inside the synovia and synovial liquid. Also, Dakhil et al.,(14) explain an increase in platelets as firmly identified with fiery markers, and suppose the main part in the pathogenesis of RA disease.

The result of present study showed that 42.85% of subject study with positive C-reactive protein (CRP) and 58.15 of subject with negative C-reactive protein. In some disease with acute infections and inflammatory process C-reactive protein (CRP) produced by the liver. In this study, the level of CRP elevated with a simultaneous raise of ESR(15). The cytokines synthesis in inflammation, particularly interleukin-1, elevate the production of CRP and decline serum albumin and transferrin synthesis.(16) Rheumatoid arthritis (RA) is a systemic inflammatory disorder in which raised C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR) suggest active disease.(17)(18).

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

Funding: Self-funding

References


The Prevalence of Metabolic Syndrome and its Complication in Patients with the Blood Disorder

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Abstract

This study was carried out with (60) samples divided into control group (20) samples ranging from (2-29) years, (40) samples from patients with blood disorders. The age of the patients with blood disorders ranged from (2) to (29) years. The current study that divided the sample of patients by age into three categories (2-7y), (8-13y) and ≥14y, also by spleen condition to splenectomized and unsplenectomized in patients with blood disorders. This study estimated Hb, ALT, AST, and ALP levels in patients with blood and control group disorders. In this analysis the hemoglobin association with ALT, AST, was found. The current study decreased significantly (p<0.05) in Hb but significantly (p<0.05) increased in concentrations of ALT, AST, and ALP. Significant negative association (p<0.05) between Hb level and ALT, AST, was found in research. This study concluded that patients with blood disorders may have metabolic syndrome due to liver damage.

Keyword: AST, ALT, thalassemia, Sickle cell anemia, metabolic syndrome.

Introduction

Metabolic syndrome (MetS), also condition X description, Deadly quartet, Reaven’s syndrome. It is defined as an energy use and storage disorder, and finding suggests that around 20-25 percent of the world ‘s population are suffering from MetS. Persons with metabolic syndrome are at high risk of developing cardiovascular disease, stroke and disease associated with fat accumulation in the walls of the arteries. In fact, persons with MetS have twice the risk of developing heart disease or/and five times the likelihood of developing diabetes with people without the condition or/and three times the risk of suffering a heart attack or stroke.[1]

Certain meanings of Metabolic syndrome (MetS) may refer to a cluster of metabolic disorders including hypertension, central obesity, insulin resistance and atherogenic dyslipidemia. The condition has linked incremental changes of certain disorders such as atherosclerosis. MetS pathogenesis includes both genetic and acquired factors which play a role in the final inflammatory pathway leading to cardiovascular disease (CVD).[2,3]

The most significant in the production and pathogenesis of insulin resistance and the pathogenesis of type 2 diabetes (T2D) and metabolic syndrome is obesity defined as an increase mass of adipose tissue. Recent study reveals that the equilibrium between white fat, which is a significant energy storage site and brown fat, is the site of energy consumption.[4,5] At the other hand, insulin resistance and metabolic syndrome can also be associated with lipodystrophy, i.e., total or partial loss of body fat.[6]

Insulin resistance plays a major role in MetS pathogenesis as it increases circulating free fatty acids (FFA). Insulin raises muscle and liver glucose intake and reduces lipolysis and hepatic gluconeogenesis. Insulin resistance in adipose tissue inhibition insulin-mediated lipolysis inhibition, resulting in increased
circulating FFAs which further inhibit insulin’s anti-lipolytic effect.[7]

Thalassemia can be characterized as a genetic anemia caused by mutation in the hemoglobin portion of the globin and protein synthesis. In many parts of the world, this illness causes massive public health problems. In one of the globin chain, thalassemia can be separated by that the hemoglobin synthesis, leading to imbalance in the synthesis of the globin chain, unsuccessful erythropoiesis, hemolysis. The major thalassemia forms are α, β, β, π, and β. The extent of thalassemia depends on the number of genes in the alpha and beta globin chain that have been damaged.[8]

Persons with thalassemia who lack sufficient globin chain synthesis leading to their red blood cells may be abnormal and unable to carry sufficient oxygen throughout the body.[9]

β-Thalassemia was known to be the most hereditary anemic disease, arising from β globin gene mutations. β-Thalassemia-associated anemia is caused by reduced β-globin chain synthesis, increased erythrocyte degradation, and limited RBC survival.[10] This condition is linked to numerous secondary complications, such as extramedullary hematopoiesis, splenomegaly, iron overload, and blood-borne infections.[11]

Sickle cell disease (SCD) refers to a category of hereditary blood disorders that cause extreme pain, decrease the life expectancy and require extensive self-management, but are also associated with stigma and prejudice. These include abnormal forms of hemoglobin which, when deoxygenated, polymerize, or gel, making the red blood cells stiffen and elongate into a sickle or crescent shape. It disturbs circulation, starves the damaged tissue and oxygen systems and causes very intense acute pain. The spleen, a critical part of the immune system, is very vulnerable to sickling, and people with SCD are susceptible to inflammation, chronic anemia and a number of life-threatening complications.[12]

Materials and Method

This study was conducted at the Al – Zahraa Teaching Hospital in Al – Najaf province, Iraq, Thalassemia Center. In addition to the control group, serum specimens were collected from patients with blood transfusion. The samples tested were (60) samples divided into control groups, (20) samples started in (2-29) years, (40) samples were taken in patients with blood disorder. The age of patients with thalassemia began in the (2) year to age (29) year.

Cases from the study can be divided by age and splenectomy.

The collection of blood sample: The Blood samples were drawn from the vein with 5 milliliters of sterilized synergies. The sample placed in the first group of tubes, two labelled tubes, contains EDTA as anti-coagulants to avoid blood clotting to be used for physiological tests. The second group of tubes was for blood to be used to prepare serum for following biochemical and biomarkers, without an anti-coagulant as gel tubes. Blood was left to coagulate at room temperature for 10 minutes, centrifuged 6000 rpm for 10 minutes, then isolated serum and freezed at -80 oC before the laboratory analysis was performed for testing.

Hemoglobin Estimation: The hematological parameters were carried out on EDTA blood using Mythic 18 (RINGELISA N CO., Turkey) in Al-Zahraa Teaching Hospital’s Hematology Laboratory. This device is a fully automated hematology analyzer estimated total blood count (CBC) on anticoagulated blood from EDTA.

Determination of Biochemical:

Estimation of ALP-concentration: It was achieved using a system supplied by JTC Germany based on enzymatic colorimetric examination, performed with different test kit.

Estimation of AST-concentration: This was achieved by an enzymatic colorimetric test-based process, performed with a different test kit, supplied by Bio system-Spain.

Estimation of ALT-concentration: This was achieved by an enzymatic colorimetric test-based process, performed with a different test kit, supplied by Bio system-Spain

Statistical analysis: The well-known statistical method (Graph Pad prism ver. 5) was introduced, and the study of variance table one-way ANOVA (by Tukey’s multiple comparison test) was used in the calculated parameters for comparison between subdivided groups. The findings were expressed as (mean ± Error of the Stander). Comparison among Subgroups . The t-test was evaluated. Coefficients of correlation were determined to estimate the correlation between markers and parameters.
Comparison of ALT, AST and ALP in patients with blood disorders and control group: The result in table (1) shown significant increase (p<0.05) in liver function test ALT (243.9 ± 23.07), AST (50.56 ± 5.513) and (256.7 ± 23.72) in patients with blood disorders compared to control group (42.40 ± 1.477), (30.60 ± 0.9526), (25.25 ± 0.9087) respectively.

Table (1): Concentration of liver function test in blood disorders patients

<table>
<thead>
<tr>
<th>Biochemical</th>
<th>Mean ± SE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patients</td>
</tr>
<tr>
<td>ALT (U/L)</td>
<td>243.9 ± 23.07*</td>
</tr>
<tr>
<td>AST (U/L)</td>
<td>50.56 ± 5.513*</td>
</tr>
<tr>
<td>ALP (U/L)</td>
<td>256.7 ± 23.72*</td>
</tr>
</tbody>
</table>

*(p<0.05) Statistically significant with control group

Comparison of ALT, AST, ALP among different age groups in patients with blood disorders: The result in table (2) shown no significant difference (p<0.05) in serum concentration of ALT, AST and ALP according age groups (2-7 years, 8-13 years, ≥ 14 years).

Table (2): Comparison of ALT, AST, ALP according age in patients with blood disorders

<table>
<thead>
<tr>
<th>Biochemical</th>
<th>Mean ± SE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2-7 y 8-13y ≥14y</td>
</tr>
<tr>
<td>ALT (U/L)</td>
<td>61.06±8.712 43.28±7.835 56.21±11.82</td>
</tr>
<tr>
<td>AST (U/L)</td>
<td>58.20±10.58 46.26±4.438 47.67±10.17</td>
</tr>
<tr>
<td>ALP (U/L)</td>
<td>257.8±35.29 224.5±29.28 275.1±42.55</td>
</tr>
</tbody>
</table>

Comparison of ALT, AST, ALP among different between splenectomized and unsplenectomized groups in patients with blood disorders: The result in
current study shown no significant difference (p<0.05) in serum concentration of ALT, AST and ALP according splenectomized and unsplenectomized, in table (3) shown.

**Correlation between Biochmical and hemoglobin:**
Tests of interaction and linear regression between concentrations of biochemistry and Hb in patients with blood disorders showed substantial negative correlation (r =-0.1) between concentrations of ALT and Hb in patients with blood disorders. There was also a strong negative correlation (r=- 0.1) in patients with blood disorders between AST and Hb in the sample, as shown in figure (2), (3).

<table>
<thead>
<tr>
<th>Biochemical</th>
<th>Mean±SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Splenectomized</td>
<td>Unsplenectomized</td>
</tr>
<tr>
<td>ALT (U/L)</td>
<td>61.33 ± 18.36</td>
</tr>
<tr>
<td>AST (U/L)</td>
<td>52.33 ± 12.17</td>
</tr>
<tr>
<td>ALP (U/L)</td>
<td>298.8 ± 93.45</td>
</tr>
</tbody>
</table>

Table (3): Comparison of ALT, AST, ALP according splenectomized and unsplenectomized in patients with blood disorders

![Figure (2): Correlation between the ALT and Hb](image1)

![Figure (3): Correlation between the AST and Hb](image2)
Discussion

In this study, patients with blood disorders suffer from thalassemia, sickle cell anemia, and aplastic anemia. In this study reported substantial decrease (p<0.05) in the amount of hemoglobin in patients with blood disorders compared with control group. It is in line with the Arshad et al. (2014) research, which indicated that patients with thalassemia may have decreased Hb level due to decreased erythrocyte numbers and decreased RBC index values (MCV, MCH, MCHC, HCT).[13]

Thus, in the analysis of Ashley-Koch et al. (2000), these patients suffer from anemia due to less oxygen content in the blood, exposing the irregular types of hemoglobin that polymerize, or bind, when deoxygenated, making the red blood cells stiffen and elongate into a sickle or crescent shape. It disturbs circulation, starves the damaged tissue and oxygen systems and causes very intense acute pain.[12]

In the study revealed a significant increase (p<0.05) in the concentration of ALT, AST and ALP in patients with blood disorders compared to control group, in the current study all patients receive blood transfusion, Current results agree with Zayed, (2018) who suggested that blood disorders may be causing liver tissue lesions indicated by elevation of the criteria for serum liver function.[14]

Metabolic syndrome may be correlated with the previous study demonstration of ALT, AST, and ALP, which showed increased concentration of this biochemical in patients with metabolic syndromes. Increased concentration of ALT and gamma-glutamyltransferase (GGT) has been shown to predict CVD in prospective studies. MetS has been indicated to be a risk factor for CVD, and the incidence has risen in developing countries, and associations between serum liver enzymes and MetS have received significant attention in recent years, which has shown that the rise in serum ALT and AST has been sluggish.[15,16]

Monteiro et al. (2014) revealed that serum ALP activities were significantly associated with high triglyceride and low HDL-cholesterol in men in this study, while serum ALP activities were significantly associated with abdominal obesity, high blood pressure, high plasma glucose, and high female triglyceride.[17]

Blood transfusion therapy was needed in most blood disorders such as thalassemia and sickle cell anemia, which contributed to iron overload in patients. Liver is the first iron overload site in children who are routinely transfused, and a common cause of morbidity. Iron surcharge occurs in both hepatocyte and reticuloendothelial cells. Iron-induced damage to the liver is characterized by progressive fibrosis, and ultimately cirrhosis. Liver damage in thalassemia induces low serum levels of total cholesterol, high density lipoproteins (HDL), and low density lipoproteins (LDL).[18]

Das et al. (2016), the latest study showing patients with thalassemia have hypertriglyceridemia, this may be an early atherosclerosis development that contributes to morbidity. The increase in TG concentration in these patients is related to oxidative stress and an increased risk of acute pancreatitis and cardiovascular diseases. Therefore early recognition is important. The rates decreased in our patient following a transfusion therapy.[19]

From above studies which revealed the positive correlation between metabolic syndrome and blood disorders, therefore the complication of most blood disorders is Metabolic syndrome can progressive to other diseases such as cardiovascular diseases, also suggest to use the liver function test to detect the Mets in patients with blood disorders. In the present study shown the significant negative correlation between ALT and Hb, also significant negative correlation between AST and Hb in patients with blood disorders. In thalassemia have low Hb levels which cause less supply of oxygen to tissue and leading to more anaerobic glycolysis, reason for more lactic acid levels. [20] Sucrose is a non-reducing disaccharide of glucose and fructose and is linked to various metabolic pathways of glucose and other sugars. As it is broken down into its constituents fructose and glucose and its increase in blood indicates metabolic syndrome, mostly in β-thalassemia patients glucose homeostasis is abnormal this may result in its elevation.[21]

Conclusion

The conclusion of this study, that demonstrated the patients with blood disorders can be have metabolic syndrome result from dysfunction of livers because increase the concentration of iron. the recommendation of this study is each patient with blood disorders, must made routine clinical tests for lipid profile. to avoid progressive to metabolic syndrome

Ethical Clearance: The Research Ethical
Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

Funding: Self-funding

References


Effectiveness of Health Education Intervention Regarding Family Planning Among Iraqi Women Attending Primary Health Centers In Baghdad During 2019

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Abstract

Background: Family planning has become a major strategy of population control both at the national and global level.

Objectives: To examine the impact of health education intervention regarding family planning on knowledge among pregnant Iraqi women.

Methodology: A quasi-experimental study was conducted at three primary health care centers in Baghdad with sample size of 90 female who were chosen by convenient sampling technique, with 2 groups: 60 lady in control group and 30 lady in intervention group. Along seven months duration, data were collected using a questionnaire which was adopted from many literatures with modifications, Chi-square and Fisher Exact test was used to test association of variables with a P. value <0.05 considered statistically significant.

Results: The age of the studied ranged between (26-35 years). The level of education for both groups was college and above degrees, (55%), with negative history of consanguinity, the control group had poor knowledge about family planning, the intervention group showed higher knowledge score than the control after the intervention. While no significant association was found between knowledge score of the participants of the whole studied sample and its socio-demographic variables.

Conclusions: Married women with highest number of children having more information about family planning than single women. Health education significantly increases the knowledge of women about all types of family planning and improves attitudes towards family planning and their usage.

Keyword: Health education, family planning, primary care.

Introduction

Global community has decided that the exact to health involves the right to regulate one’s health and body include sexual choice (1). Family planning has become a major strategy of population control both at the national and global level (2). Big families and quickly breed in inhabitants hold back progress at both the home and state portion, even so family scheduling systems are obtainable, females not take it due to economic limitations, individual opinions and antagonism from family associations or fears about the specious contrasting properties on well-being or upcoming fertility. The family planning programs helped pave the way for much subsequent health, social, and economic programs, they helped establish the feasibility and legitimacy of mounting large-scale interventions (3).

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Definition of Health Education: Health professionals and others impart information to patients that will improve their health status or alter their health behavior by a process. Iraqi family planning Organization was established in 1971, and Iraqi ministry of health initiated family planning program at 1974-1981, but till now Iraq have unmet need for family planning as the official united nation site for the millennium development. The solutions to active and supportable family-planning sequencers are fine recognized: high quality governmental assurance, a wide-ranging union of support from choice collections; sufficient finance; reduced families members and modern contraceptives done by mass broadcasting etc.; and creation a variety of procedures obtainable through medical services, public selling, and outreach facility. Accessible evaluations refer that admission to PHC in Iraq is insufficient, the level of perceived quality is low, the level of physical organisation is not well demand and wants chief cares, purpose is obviously incomplete, low level of drug supply, and not always the crucial facilities found. PHC schedules reinforces the MOH exertions with concentration on family training perfect of deal transfer, and promotions MOH in the Conclusion of Well-being Info Arrangement and Human Incomes for Well-being strategies. Aim of the study to examine the impact of health education intervention on family planning on knowledge about family planning among Iraqi women.

Method

Experimental Study, 90 female was conducted from the 1st Dec. 2018 to the End of July 2019 at three primary health care centers of family medicine in Baghdad at Alrusafa health Directorate (AI-Mustanseria, Alselaihk 1st, Al- Alselaihk 2nd PHCCs). 90 women with two groups: 60 woman in control group and 30 woman in intervention group. Inclusion Criteria: all Iraqi females attending PHC centers at child bearing age (14-45). Exclusion Criteria: any female who did not meet the above mentioned inclusion criteria automatically excluded from the study. Direct interview and specially designed questionnaire that derived from previous literatures, with some modifications that was done by the researches and validated by three experts of family and community medicine. General Sociodemographic Data: sector, PHC name, age, marital status, number of children, breast-feeding or not, educational level, occupation, consanguinity with the husband. Knowledge Section: consists of 33 questionnaire divided into 3 parts; part 1: definition of family planning (male and female types, mechanical and hormonal types), part 2: involved family planning types specifically used by female, part 3: involved family planning types specifically used by male including these questions varies between multiple choice or tabulated pattern consist of (yes, no, i don’t know) to assess people knowledge about family planning. To assess the knowledge, scoring system used were each correct answer scored as 1, incorrect answer or “I Don’t Know” scored as 0 as follows: ≤ 16 = Poor, 17-25 = Fair, 26-33 = Good.

Statistical Analysis: Done by using (SPSS) V.23 descriptive statistics used, t-test used to check if there was any difference in sociodemographic characteristics between control group and intervention group. Chi – Square and Fisher Exact Test used to test association of variables with. P- Value < 0.05 considered statistically significant; also, ANOVA test used for comparison of knowledge score for the study sample groups.

Results

The study was conducted on 90 participants, of them 30 participants were assigned as intervention group and 60 were assigned as control group more than half of the studied sample had age that ranged between (26-35 years), nearly all the studied sample had less than five children most of the participants were married. The highest level of education for both groups was college and above degrees, were it reaches nearly 55% while illiterate participant form about (3.3%) as shown in (table 1). Regarding occupation, 56% of the intervention group were housewives while 51% of the control group were employee. Nearly 85% of the whole sample did not breast fed their children, with negative history of consanguinity (table 1). In the current study, it was found that the control group had poor knowledge about family planning (45%) shown in (fig1). There was no significant variation between the two groups regarding the demographic variables of the study, as shown in table (2) . The study showed that there was no significant association between knowledge score of the participants of the completely studied sample and its Sociodemographic variables, as shown in table (3). There was a statistically significant difference between percentages of means of the three groups. Were the interference group showed advanced knowledge score than the control after the intervention? (Table 4). There was significant difference for the intervention group regarding knowledge about family planning before (59.39 %) and after (93.1 %) intervention (table 1).
### Table (1): variables distribution

<table>
<thead>
<tr>
<th>Variables</th>
<th>Percentage</th>
<th>Intervention</th>
<th>Control</th>
<th>No.</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital State Single</td>
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<td></td>
<td></td>
<td>0</td>
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<td></td>
<td></td>
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<td>93.3</td>
<td>83.3</td>
</tr>
<tr>
<td>Divorce</td>
<td></td>
<td></td>
<td></td>
<td>3.3</td>
<td>3.3</td>
</tr>
<tr>
<td>Widow</td>
<td></td>
<td></td>
<td></td>
<td>3.3</td>
<td>5</td>
</tr>
<tr>
<td>Education Level</td>
<td></td>
<td></td>
<td></td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td></td>
<td></td>
<td></td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>Read</td>
<td></td>
<td></td>
<td></td>
<td>3.3</td>
<td></td>
</tr>
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<td></td>
<td>30</td>
<td>30</td>
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<td>College</td>
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<td></td>
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</tr>
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</tr>
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<td>Employed</td>
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<td>51.7</td>
</tr>
<tr>
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<td>90</td>
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</tr>
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<td></td>
<td>86.7</td>
<td>13.3</td>
</tr>
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<td></td>
<td>93.1</td>
<td>6.9</td>
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<td>59.9</td>
<td>30.1</td>
</tr>
<tr>
<td>Intervention</td>
<td></td>
<td></td>
<td></td>
<td>93.1</td>
<td>6.9</td>
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</tbody>
</table>

### Table (2): Socio-demographic characteristics of the entire study sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control</th>
<th>Intervention</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>Percent</td>
<td>No.</td>
</tr>
<tr>
<td>Sector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Al-Adhamia</td>
<td>41</td>
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<tr>
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</tr>
<tr>
<td>PHC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Al-Selaikh 1st</td>
<td>12</td>
<td>20.00</td>
<td>10</td>
</tr>
<tr>
<td>Al-Selaikh 2nd</td>
<td>29</td>
<td>48.30</td>
<td>12</td>
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<tr>
<td>Al-mustanseria</td>
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<td>31.70</td>
<td>8</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-25</td>
<td>13</td>
<td>21.70</td>
<td>5</td>
</tr>
<tr>
<td>26-35</td>
<td>33</td>
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<tr>
<td>36-45</td>
<td>14</td>
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<td>6</td>
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<tr>
<td>Marital Status</td>
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<td></td>
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</tr>
<tr>
<td>Single</td>
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<tr>
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<td>50</td>
<td>83.30</td>
<td>28</td>
</tr>
<tr>
<td>Divorced</td>
<td>2</td>
<td>3.30</td>
<td>1</td>
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<tr>
<td>Widow</td>
<td>3</td>
<td>5.00</td>
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<tr>
<td>Number of Children</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Less Than 5</td>
<td>52</td>
<td>86.70</td>
<td>23</td>
</tr>
<tr>
<td>5 And More</td>
<td>8</td>
<td>13.30</td>
<td>7</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>27</td>
<td>45.00</td>
<td>17</td>
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<tr>
<td>Student</td>
<td>2</td>
<td>3.30</td>
<td>2</td>
</tr>
<tr>
<td>Employee</td>
<td>31</td>
<td>51.70</td>
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<tr>
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<tr>
<td>Read/Write</td>
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<td>8.30</td>
<td>6</td>
</tr>
<tr>
<td>Secondary</td>
<td>18</td>
<td>30.00</td>
<td>9</td>
</tr>
<tr>
<td>College/Above</td>
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<td>55.00</td>
<td>15</td>
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<tr>
<td>Variable</td>
<td>Control</td>
<td>Intervention</td>
<td>P-value</td>
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<td>---------------</td>
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</tr>
<tr>
<td></td>
<td>No.</td>
<td>Percent</td>
<td>No.</td>
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<tr>
<td>Breast Feeding?</td>
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<td>10.00</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>54</td>
<td>90.00</td>
</tr>
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<td>Consanguinity</td>
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<td>28.30</td>
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<tr>
<td></td>
<td>No</td>
<td>43</td>
<td>71.70</td>
</tr>
</tbody>
</table>

Table (3): Association between knowledge level and Sociodemographic variables (control)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Knowledge Level</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>100%</td>
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<td>Alrusafa</td>
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<tr>
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<tr>
<td></td>
<td>Alselaih 2nd</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Almustanseria</td>
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<tr>
<td>PHC</td>
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<td></td>
<td>26-35</td>
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<td>36-45</td>
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<td>Divorced</td>
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<tr>
<td></td>
<td>Widow</td>
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</tr>
<tr>
<td>Number of Children</td>
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<tr>
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<td>Occupation</td>
<td>Housewife</td>
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</tr>
<tr>
<td></td>
<td>Student</td>
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</tr>
<tr>
<td></td>
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<td>Primary</td>
<td>2</td>
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<tr>
<td></td>
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</tr>
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</table>
Table (4): Comparison of knowledge score for the study sample groups

<table>
<thead>
<tr>
<th>Group</th>
<th>No.</th>
<th>Mean of knowledge score</th>
<th>F</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>30</td>
<td>19.6</td>
<td>68.355</td>
<td>0.000*</td>
</tr>
<tr>
<td>Post</td>
<td>30</td>
<td>30.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>60</td>
<td>18.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discussion

Family planning is one of the greatest development and public health favorable outcome of the past 50 years. It has transformed and saved the lives of millions of children and women, it has helped to slow down population growth, and it has hold up families to break the cycle of poverty (10). The study revealed that Iraqi women had poor knowledge level about family planning, as less than half of them answered correctly regarding questions related family planning method, but the reviled level is still higher than that of the study done in Erbil on two groups the Score of knowledge in 2 groups G1 7.7% and G2 14.0% G2(8). Similar studies were conducted in Australia (9) also a low level of knowledge and in Egypt (10) showed that about EC most of the study subjects (75.5%) lack the knowledge about EC method, on the other hand other studies were in consistent with our results, like the study done in Sudan (2016) were highly score of knowledge level about family planning 91.3% (11), also the study done in Nigeria from (2003-2013) the knowledge level highly proportion 75% (12). Association between knowledge of the Iraqi Women Regarding family planning and their socio demographic data: there was no significant association between age and knowledge of participants regarding family planning in our study, while in a study done in Northeast Ethiopia showed that, the age of the participants had an association with practicing family planning (13). There was no significant association between Marital status and knowledge of participants regarding family planning in our study, while in a study done in Afghanistan that showed the participants who had job knew more about family planning method than who did not have a job (15). No significant association between the knowledge and educational level of participants, this was in consistent with the study done in Mosul were there increase percentage of knowledge about unmet need from illiterate 34% to high education group 60% (16). And also study done in Ethiopia (17) and Egypt (18) and Baghdad city (19) were the educational level of the mother and her husband has been identified with a highly significant relation to increase knowledge of the use of FP also another study done in Saudi (20) and Ghana (21). No significant association between breast-feeding and knowledge of participants regarding family planning in our study. Similar to our study done in chufa their knowledge about breast-feeding was a non-significant and poor knowledge about breast-feeding (22). In Our study, the knowledge scores of the intervention group were higher than control group, and the significant statistical difference between the groups. By using, the interference program that promoted health education about family planning in our study the score of health education was (59.39%-93.13%) For pre and post intervention, respectively these results were similar to research studies done in Nigeria increase knowledge in intervention group (36.6%-44.6%) in pre and post intervention groups respectively (23).

Conclusion

Married women with highest number of children having more information about family planning than single women do. Health education significantly increases the knowledge of women about all types of Family planning and improves attitudes towards family planning and their usage.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

Funding: Self-funding

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The Correlation of Epicardial Fat Thickness with Ischemic Heart Disease among Patients Consulting Merjan Medical City in Babil

Hassan Salim Aljumaily¹, Abdulhamza Rajooj Hmood²

¹Ass. Prof., College of Medicine, Babylon University/Iraq, ²Ass. Prof., College of Medicine, Karbala University/Iraq

Abstract

Introduction: Epicardial fat thickness (EFT) is regarded as marker of cardiovascular risk.

Aim of Study: To show if there is correlation between EFT with ischemia and its correlation with other variable as age, sex, hypertension, Diabetes, smoking and Body mass index.

Patients and Method: We studied 100 patients who consulting merjan medical city in Babylon province for the period from December 2017 to May 2018. Transthoracic echocardiography was done for all patients; we measure wall motion score and EFT. 50 patients had ischemic heart disease (IHD). EFT measured at free wall of RV at end systole both group from short axis view and long axis view and wall motion score also measured according to this formula.

Results: Mean age was (58.67±13.3), 50% had hypertension, 45% had diabetes .74 patient were male 37% are smoker regarding body mass index, 31.87% are obese, 31.87% over weight 36.2% are normal body mass index. PT with no IHD had normal wall motion score 16/16 While IHD group PT had higher than 16-wall motion score. EFT had significant correlation with high ischemic score, EFT was higher among smoker patients(p value 0.001) and diabetic patients(p value 0.005) and hypertensive patients (p value 0.002). Patients with increasing BMI had higher EFT(p value 0.001).

Conclusions: This study concludes that patients with higher EFT had higher ischemic score, so it is arisk factor of IHD. EFT more than 5.5 in male and 5.7 in female associated with ischemia. Epicardial fat increase with higher BMI and more in smoker,HT and diabetic patients.

Keyword: Epicardial fat thickness, ischemic heart disease, echocardiography.

Introduction

EFT has been designated as a risk factor for CAD(1) and predictor for the presence of cardiovascular insults(2), its site between visceral pericardium and the myocardium. Studies show that epicardial fat immediately surrounds the coronary arteries it postulated that it produce substances that act as an endocrine organ secreting hormones like bio active chemokines and adipokines(3) which predispose to coronary artery disease consequently EFT may have significant role as risk factor in patients presenting with chest pain. EFT can be calculated by TTE, cardiac (CT), and cardiac MRI. Assessment by TTE has come to the front because of many benefits, like availability, lesscost; there is no exposure to radiation. EFT illustrated by TTE is the echo-lucent area between the visceral pericardium and myocardium of the right ventricle appear above the right ventricular free wall as a thick line(4,5). While assessing epicardial fat (EPF), necessary to differentiate it from pericardial adiposetissue, both emerge from different embryonic sites, their local circulation and bimolecular...
characteristics are different\(^6\). Anterior to EPF and parietal sheet, there is pericardial tissue (hypoechoic zone)\(^7\). EPF not interfere with cardiac cycle so it can simply separation. EFT have transparent and spotted appearance on Echo and Pericardial effusion highly hypoechoic\(^8\). Difference studies about EFT thickness\(^9\) stated that EFT width designed throughout end – systole it is (1-22.6) mm, mean is 6.5 mm in females, 9.5 mm in male\(^7\). The concept is that EFT play a role in the incident of ischemic heart disease through correlation with other risk factors and by direct paracrine and other endocrine effects. This theory was suspected many years ago illustrating there is no atherosclerosis inside myocardial only\(^10\). Coronary arteries with no EFT detached from it by abridge of myocardial tissue that save from progress of atherosclerosis. Loss adipose tissue in myocardium consider important protection mechanism against atherosclerosis in intramural coronary artery while epicardial coronary arteries have adipose tissue so it more likely to have atherosclerosis. EFT give feature of atherosclerosis by discharge of bioactive molecules and specialmechanical factor in coronary arteries\(^11\). Because of its intrinsic compressibility epicardial fat suggested to play significant role in the vessel wall expansion called positive remodeling. Coronary injuries, which are bounded by the epicardial fat, have expanded more than injuries bounded by the myocardium\(^12\).

### Method

A cross sectional study 100 patient were studied whom consulting merjan medical city in Babylon province for the period from December 2017 to May 2018. Half of patients had IHD. Medical history of HT, D.M, gender and smoking obtained and their age recorded. Blood pressure was measured by mercurial sphygmomanometer hypertension when SBP\(\geq 140\) mmHg, DBP\(\leq 90\) mmHg or need for anti-hypertensive drugs, body mass index was calculated as BW in kilogram divided by height squared\(^13\). DM according to criteria of American diabetic association as FBG >126 mg (\(>7\) mmol/dl) or patient with classical symptom of hyperglycemia with random plasma glucose > 200 mg /dl or (\(>11.1\) mol/dl)\(^14\). Lipid profile not assessed because most patient with ischemic heart disease on lipid lowering age.

**Echo Measurement:** TTE were performed with GE vivid E9 echo devise instrument according to standard technique with patient in left lateral side to measured EFT on RV free wall from parasternal long and short axis view we assess the finding three time and we take the mean. this assessment obtained under supervision of two cardiologist. We prefer to measure at end systole because compression of EPF occur during diastole. Also by echocardiography, we assess wall motion abnormal wall motion that can be classified as (2-1).

<table>
<thead>
<tr>
<th>Description</th>
<th>Motion</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full in ward motion</td>
<td>Normal</td>
<td>1</td>
</tr>
<tr>
<td>&lt; 50% full inward motion</td>
<td>Hypokinesia</td>
<td>2</td>
</tr>
<tr>
<td>No inward motion</td>
<td>Akiniesia</td>
<td>3</td>
</tr>
<tr>
<td>Out ward motion</td>
<td>Dyskinesia</td>
<td>4</td>
</tr>
<tr>
<td>Out pouch of wall</td>
<td>Aneurysm</td>
<td>5</td>
</tr>
</tbody>
</table>

**Exclusion Criteria:** Poor echo window, patients with pericardial effusion, Pleural effusion, history of chronic lung or kidney disease or CABG.

### Results

Table (1): shows distribution of patients according to their sociodemographic characteristics including (age, gender and smoking habit).

<table>
<thead>
<tr>
<th>Sociodemographic Characteristics</th>
<th>Age (58.67 ±13.3)* (24-86)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
</tr>
<tr>
<td>Male</td>
<td>74</td>
</tr>
<tr>
<td>Female</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td>Smoking habit</td>
<td>Smoker</td>
</tr>
<tr>
<td>Smoker</td>
<td>37</td>
</tr>
<tr>
<td>Non smoker</td>
<td>63</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

*Mean and standard deviation, **Range

Table (2): The Distribution of patients according to hypertension and Diabetes mellitus history

<table>
<thead>
<tr>
<th>Chronic diseases</th>
<th>N</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>50</td>
<td>50%</td>
</tr>
<tr>
<td>Absent</td>
<td>50</td>
<td>50%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>45</td>
<td>45%</td>
</tr>
<tr>
<td>Absent</td>
<td>55</td>
<td>55%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>
Figure 1 shows the relationship between epicardial fat (mm) and BMI (kg/m²) among study patients. There was significant positive linear relation between these two variables. (P = 0.001*).

![Graph showing correlation between BMI and epicardial fat](image1)

Figure 1: The correlation between BMI (kg/m²) and epicardial fat (mm) among study patients

Figure 2 shows the correlation between Ischemic score and epicardial fat (mm) among study patients (n=100). There was significant positive linear relationship.

![Graph showing correlation between ischemic score and epicardial fat](image2)

Figure 2 shows the correlation between Ischemic score and epicardial fat (mm) among study patients (n=100). There was significant positive linear relationship.
The mean differences of pericardial fat (mm) according to study variables. There is more epicardial fat thickness in hypertensive, diabetic patient and those with history of smoking with significant correlation while gender show no significant (table 3).

**Table 3: The mean differences of epicardial fat (mm) according to study variables.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Ischemia</th>
<th>N</th>
<th>Mean ± SE</th>
<th>t-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td>74</td>
<td>4.24 ± 2.07</td>
<td>0.87</td>
<td>0.38</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td>26</td>
<td>3.85 ± 1.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hypertension</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td></td>
<td>50</td>
<td>4.76 ± 2.02</td>
<td>3.24</td>
<td>0.002*</td>
</tr>
<tr>
<td>Absent</td>
<td></td>
<td>50</td>
<td>3.52 ± 1.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Diabetes mellitus</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td></td>
<td>45</td>
<td>4.77 ± 2.14</td>
<td>2.88</td>
<td>0.005*</td>
</tr>
<tr>
<td>Absent</td>
<td></td>
<td>55</td>
<td>3.63 ± 1.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Smoking habits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoker</td>
<td></td>
<td>37</td>
<td>4.96 ± 2.13</td>
<td>3.29</td>
<td>0.001*</td>
</tr>
<tr>
<td>Non smoker</td>
<td></td>
<td>63</td>
<td>3.66 ± 1.75</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fig: 3: Epicardial fat of Ischemic and non-ischemic heart disease according to gender: Female patients with ischemia had higher pericardial fat thickness than male patients.

**Discussion**

In the current study, we discuss correlation of EF with the IHD and EFT & its association with other risk factors for IHD such as HT, DM, BMI, smoking and age. There is a relationship between IHD and EFT, defined as significant independent risk factors among other risk factors. For the role of EFT as CAD risk factors there is a large control cases studies which suggest this correlation, Ahn et al(4) reveal EFT was more thick in IHD than patients without ischemia and it may give an further marker For IHD many researches shown that adipose tissue, specifically visceral fat, express many genes attributed to production of adipokine, that had significant evidence for occurrence of CAD in obese patients^{15,16,17}. Epicardial fat located in adjacent to the coronary tree that promote the paracrine effects of epicardialadipokines, as part of the pathogenesis of CAD^{18,19}. There is two important mechanisms for this association: 1- epicardial fat is a part of visceral adiposity and is related to cardiovascular risk factors and metabolic syndrome^{20}. 2- EFT had endocrine features, Ahn et al^{4}; stated that EFT active metabolite and had obvious origin of pro and anti-inflammatory cytokine creation,
this unavoidably influence cardiac role and morphology. It yield numerous bioactive particles like adiponectin, resistin, and inflammatory cytokines\(^{(21,22)}\). Transthoracic echocardiography gives a clear assessment of epicardial fat thickness. This can approved by MRI that regarded as the gold standard way to assess visceral adiposity. ECHO as a non-invasive test with little cost used for assessment of epicardial adipose tissue and diagnosis of CAD\(^{(23)}\) In our study, EFT more than 5.5 in male and 5.7 in female associated with ischemia this in agreement with lacobellis et al \(^{(9)}\) found that EFT thickness was higher in patient with ischemia. In the current study, important correlation between EF and BMI (p value 0.001). There is strong association between EPF and visceral adipose tissue BMI where demonstrated by Jin-Won et. Al.\(^{(24)}\) which show Significant association were illustrated between EFT and BMI (p=0.044). Kangwha Cohort Study demonstrated that cardiovascular diseases risk was clearly more in the BMI \(\geq 27 \text{ kg/m}^2\) group in the Korean people \(^{(25)}\). Higher epicardial fat thickness exclusively associated with the incidence of diabetes, and cardiac contractile dysfunction in diabetes \(^{(26)}\). In our study, there is higher pericardial fat thickness in diabetic patient than non-diabetic (pvalue 0.005). Increase visceral fat is linked with higher BP presumable over the renin angiotensin scheme. There is association between hypertension and EFT according research \(^{(27)}\). EAT mount increase in healthy wealthy patients with overstated BP reply to workout stress testing, all this persons with danger of coming hypertension \(^{(28)}\). EFT in ECHO showed increase in patients with hypertension not treated with non-dipper blood pressure pattern \(^{(29)}\) in our study there is higher pericardial fat thickness in hypertensive patient than non-hypertensive(p value 0.002). Cigarette smoking is an independent indicator of elevated volume of epicardial fat \(^{(30)}\). In our study, there is higher pericardial fat thickness in smoker patient than nonsmokers. (Pvalue 0.001). Obesity is important reasons of cardiovascular illness and death. Overweight, obesity reasons 2.8 million deaths worldwide annually, 3% to 9% of possible years of life misplaced, responsible for at least 35% of patients with ischemic heart disease\(^{(31)}\), it related to increase incidence of atherosclerosis and the additional rise in cardiovascular danger\(^{(32)}\). Ectopic adiposity defined to include a higher cardiovascular danger than subcutaneous adiposity\(^{(33)}\).

**Conclusion**

Patient with higher EFT had higher ischemic score i.e. EFT is a risk factor of IHD. EFT more than 5.5 in male and 5.7 in female associated with ischemia. Epicardial fat increase with higher BMI and more in HT, DM and in smoker patients.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** Non

**Funding:** Self-funding

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Comparative Evaluation of Efficacy of Three Port Versus Standard Four Port Laparoscopic Cholecystectomy

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¹Associate Professor, ²Assistant Professor, ³Professor, Department of Surgery, Krishna Institute of Medical Sciences Deemed to be University, Karad, Maharashtra, India

Abstract

Background: Laparoscopic cholecystectomy has established itself firmly as the “gold standard” for the treatment of gallstone disease. The present study was conducted to compare three port versus standard four port laparoscopic cholecystectomy.

Materials and Method: The present study was conducted on 120 gall stones patients of both genders. All patients were divided into two groups viz. group I who were subjected to the three port technique and group II patients who were subjected to the conventional four port technique. Intra-operative findings, pain score etc. was compared.

Results: The mean VAS was 2.14 in group I and 4.30 in group II and mean operative time was 51.2 minutes in group I and 62.1 minutes in group II. Intra-operative complications were perforation seen 6 patients in group I and 4 in group II, stone spillage 4 in group I and 3 in group II, bleeding from liver 5 in group I and 4 in group II, cystic artery bleeding 2 in group I and 1 in group II. Post-operative complications were fever seen 4 patients in group I and 7 in group II, vomiting 5 in group I and 6 in group II, Basal pneumonitis 3 in group I and 5 in group II, seroma 1 in group I and 2 in group II.

Conclusion: Authors found that three port laparoscopic cholecystectomy found to be better than standard four port laparoscopic cholecystectomy.

Keywords: Basal pneumonitis, Laparoscopic cholecystectomy.

Introduction

The first laparoscopic cholecystectomy (LC) was performed in 1987 by Philip Mouret and later established by Dubois, Perissat, Reddick and others in 1990’s. Since then, there have been many changes and improvements in the technique.¹ Traditional LC is performed using 4-port technique. The fourth (lateral) trocar is used to grasp the fundus of the gall bladder soas to expose the Calot’s triangle. With increasing surgeon experience, LC has undergone many refinements including reduction in port size and number. It has been argued that the fourth trocar may not be necessary and laparoscopic cholecystectomy can be performed safely without using it.²

LC is now the gold standard treatment of symptomatic gallstone disease. Standard LC is performed by using four trocars.³ The fourth trocar is used to retract the liver for better exposure of Calot’s triangle or to grasp the fundus of the gall bladder, pulling upward and outward to expose Calot’s triangle (American technique). In recent years, many investigators have attempted to improve the established technique of LC.⁴ The goal has been to minimize the invasiveness of this procedure by reducing the number and size of-ports, arguing that...
the fourth trocar may not be necessary and LC can be performed safely without it. Fortunately, several studies have reported three-port LC was technically possible.\(^5\) The present study was conducted to compare three port versus standard four port laparoscopic cholecystectomy.

**Materials and Method**

The present study was conducted in the department of General surgery. It comprised of 120 gall stones patients of both genders. All patients were informed regarding the study and written consent was obtained. Ethical clearance was obtained from institutional ethical committee.

Data such as name, age etc. was reported. All patients were divided into two groups viz. group I who were subjected to the three port technique and group II patients who were subjected to the conventional four port technique. Intra-operative findings, pain score etc. was compared. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**Results**

**Table I: Distribution of patients**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Group I</th>
<th>Group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technique</td>
<td>Three port technique</td>
<td>Four port technique</td>
</tr>
<tr>
<td>Number</td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

Table I shows that in group I patients three port technique and in group II patients conventional four port technique. Each group had 60 patients.

**Table II: Assessment of parameters**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group I</th>
<th>Group II</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAS</td>
<td>2.14</td>
<td>4.30</td>
<td>0.01</td>
</tr>
<tr>
<td>Operative time (mins)</td>
<td>51.2</td>
<td>62.1</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Table II shows that mean VAS was 2.14 in group I and 4.30 in group II and mean operative time was 51.2 minutes in group I and 62.1 minutes in group II. The difference was significant (P< 0.05).

**Table III: Intra-operative complications in both groups**

<table>
<thead>
<tr>
<th>Complications</th>
<th>Group I</th>
<th>Group II</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perforation</td>
<td>6</td>
<td>4</td>
<td>0.12</td>
</tr>
</tbody>
</table>

Table III shows that intra-operative complications were perforation seen 6 patients in group I and 4 in group II, stone spillage 4 in group I and 3 in group II, bleeding from liver 5 in group I and 4 in group II, cystic artery bleeding 2 in group I and 1 in group II. The difference was non-significant (P> 0.05).

**Table IV: Post-operative complications in both groups**

<table>
<thead>
<tr>
<th>Complications</th>
<th>Group I</th>
<th>Group II</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>4</td>
<td>7</td>
<td>0.26</td>
</tr>
<tr>
<td>Vomiting</td>
<td>5</td>
<td>6</td>
<td>0.84</td>
</tr>
<tr>
<td>Basal pneumonitis</td>
<td>3</td>
<td>5</td>
<td>0.15</td>
</tr>
<tr>
<td>Seroma</td>
<td>1</td>
<td>2</td>
<td>0.20</td>
</tr>
</tbody>
</table>

Table IV, shows that post-operative complications were fever seen 4 patients in group I and 7 in group II, vomiting 5 in group I and 6 in group II, Basal pneumonitis 3 in group I and 5 in group II, seroma 1 in group I and 2 in group II. The difference was non-significant (P> 0.05).

**Discussion**

LC is now the gold standard treatment of symptomatic gallstone disease. LC has now replaced open cholecystectomy as the first-choice of treatment for cholelithiasis and inflammation of the gallbladder unless there are contraindications to the laparoscopic approach. This is because open surgery leaves the patient more prone to infection. Sometimes, a laparoscopic cholecystectomy will be converted to an open cholecystectomy for technical reasons or safety.\(^6\)

Laparoscopic cholecystectomy has established itself firmly as the “gold standard” for the treatment of gallstone disease. Existing literature has focused most exclusively on the biliary complications of this procedure, but other complications such as significant hemorrhage during laparoscopic cholecystectomy have not been documented.\(^7\) The present study was conducted to compare three port versus standard four port laparoscopic cholecystectomy.
In present study, in group I patients three port technique and in group II patients conventional four port technique. Each group had 60 patients. The mean VAS was 2.14 in group I and 4.30 in group II and mean operative time was 51.2 minutes in group I and 62.1 minutes in group II. Sharma et al\(^8\) found that the mean operative time was compared and found to be less in group A. Intraoperative and postoperative complications was similar in both groups. The postoperative pain was less in group A. The mean hospital stay was less in group A (1.27 days) than group B (1.95 days). Better cosmetic results and patient satisfaction was observed in group A. 5 patients of group A required fourth port and 3 patients of group B required conversion to open cholecystectomy.

We found that intra-operative complications were perforation seen 6 patients in group I and 4 in group II, stone spillage 4 in group I and 3 in group II, bleeding from liver 5 in group I and 4 in group II, cystic artery bleeding 2 in group I and 1 in group II. Post-operative complications were fever seen 4 patients in group I and 7 in group II, vomiting 5 in group I and 6 in group II, Basal pneumonitis 3 in group I and 5 in group II, seroma 1 in group I and 2 in group II.

Kumar et al\(^9\) found that patients in the 3-port group had shorter meanoperative time for the 4-port group and less pain at port sites. Overall pain score, analgesia requirements, hospital stay and patient satisfaction score on surgery and scars were similar between the two groups. Harsha et al\(^10\) found that the first group, three-port LC group consisted of 25 cases and the second group, the standard four-port LC group consisted of 25 cases were analyzed for the following outcome measures namely conversion rates, operating time, intra-operative complications, post-operative pain score, analgesic requirement and hospital stay. Demographic data was comparable in both groups. Conversion rate was nil in both groups. The mean operating time was comparable in both groups. Post-operative pain was significantly less in three-port group and analgesic requirement when compared with the four-port group. Hospital stay was significantly less in three port group compared with the four-port group owing to post-operative pain score. There was no statistical difference in the complications rate in both groups: gallbladder perforation, bile leakage and bleeding from liver bed.

**Conclusion**

Authors found that three port laparoscopic cholecystectomy found to be better than standard four port laparoscopic cholecystectomy.

**Conflicts of Interest:** The author declare that there is no conflict of interest regarding the publication of this paper.

**Source of Funding:** Self

**Ethical Clearance:** Ethical clearance has been taken from Institutional Ethical Committee.

**References**

Assessment of Psychiatric Illness in Burnt Patients

Sharad Vasant Kshirsagar¹, Ajay Deshmukh²

¹Associate Professor, ²Assistant Professor, Department of Psychiatry, Krishna Institute of Medical Sciences Deemed to be University, Karad, Maharashtra, India

Abstract

Background: Psychological distress is among the most frequent and debilitating complications post-burn injury. The present study was conducted to assess psychiatric illness in burnt patients.

Materials and Method: The present study was conducted on 102 burn patients of both genders. Incidence of pre-morbid psychopathology, marital status, education and employment status was recorded.

Results: Out of 102 patients, males were 60 and females were 42. 67 patients were married and 35 were unmarried, 38 were skilled and 64 were semi skilled, 42 had primary, 35 had secondary and 25 were uneducated. The difference was significant (P< 0.05). Major psychiatric illness were depression in 32, personality disorder in 10, schizophrenia in 5, substance disorder in 7 and Posttraumatic stress disorder in 12 cases. The difference was significant (P< 0.05).

Conclusion: Authors found high incidence of psychiatric illness such as depression, personality disorder, schizophrenia and substance disorder in burn patients.

Keywords: Burn, Depression, Schizophrenia.

Introduction

Psychological distress is among the most frequent and debilitating complications post-burn injury. Preliminary reports using the Burn Model System (BMS) dataset indicated that one-third of patients with major burns had clinically significant psychological distress at the time of discharge and the mean level of psychological distress in the BMS sample was significantly higher than that reflected in published data from a normative sample.¹ In addition, psychological distress of in-patients of the hospital predicted significantly greater physical impairment for at least 1 year post-burn.² Clinically significant psychological distress also accounted for substantial variance in concurrently assessed quality of life at 2 (58%), 6 (68%) and 12 (51%) months post-burn injury. Severe psychological distress is an important secondary complication of major burn injuries, with long-term consequences.³

The treatment of burns injuries commences with a period of specialized intensive care during wound care and surgical treatment are carried out when necessary. Management of pain and anxiety related to the accident and to burn care procedures such as surgery, are main challenges during this phase of care. For the severely injured, this first period is just the beginning of a long journey involving adaptation to post burn life.⁴ Rehabilitation of the patients starts on the day of injury and comprises measures that are also undertaken during the phase of very specialized and technologically focused intensive care. Active surgical treatment of wounds and scars, as well as physiotherapy and occupational therapy continue long after the patient has left the intensive care unit and are part of the process of regaining functional capacity.⁵ The present study was conducted to assess psychiatric illness in burnt patients.
Materials and Method

The present study was conducted at Krishna Institute of Medical Sciences Deemed to be University, Karad, Maharashtra, India. It comprised of 102 burn patients of both genders. Ethical approval was obtained from institute prior to the study. All patients were informed regarding the study and written consent was obtained.

General information such as name, age etc. was recorded. All patients were managed in the department. Incidence of pre-morbid psychopathology, marital status, education and employment status was recorded. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I Distribution of patients

<table>
<thead>
<tr>
<th>Total- 02</th>
<th>Gender</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>42</td>
</tr>
</tbody>
</table>

Table I shows that out of 102 patients, males were 60 and females were 42.

Table II Demographic parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Number</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>67</td>
<td>0.01</td>
</tr>
<tr>
<td>Unmarried</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled</td>
<td>38</td>
<td>0.02</td>
</tr>
<tr>
<td>Semi skilled</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>42</td>
<td>0.05</td>
</tr>
<tr>
<td>Secondary</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Uneducated</td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

Table III Incidence of pre-morbid psychopathology

<table>
<thead>
<tr>
<th>Psychiatric illness</th>
<th>Number</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>32</td>
<td>0.01</td>
</tr>
<tr>
<td>Personality disorder</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Substance abuse</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Posttraumatic stress disorder</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Table II shows that 67 patients were married and 35 were unmarried, 38 were skilled and 64 were semi skilled, 42 had primary, 35 had secondary and 25 were uneducated. The difference was significant (P< 0.05).

Table III, shows that major psychiatric illness were depression in 32, personality disorder in 10, schizophrenia in 5, substance disorder in 7 and Posttraumatic stress disorder in 12 cases. The difference was significant (P< 0.05).

Discussion

Distress may be manifested in other forms as well. Body image dissatisfaction appears common in patients with burn injuries. Sleep disturbances occur frequently among in-patients with burns, e.g., nightmares in 39% and significant sleep problems in 75%. Furthermore, many adult Swedish and US burn survivors continue to report nightmares (30–43%) and insomnia (37%) between 1 and 11 years post-burn. Sleep problems, PTSD symptoms and scar-related problems were highly intercorrelated in a Dutch sample. The present study was conducted to assess psychiatric illness in burn patients.

In this study, out of 102 patients, males were 60 and females were 42. We found that 67 patients were married and 35 were unmarried, 38 were skilled and 64 were semi skilled, 42 had primary, 35 had secondary and 25 were uneducated. Madianos et al in their prospective study of 45 patients with burn injuries explored the prevalence of psychological and psychiatric disorders among burn survivors. Psychological impairment was found to be 45.5 and 40% at the baseline and follow-up assessments, respectively. The extent of burns was found to be associated with psychological impairment. The prevalence of psychiatric disorders (any DSM-III nosological entity) reached 46.6% at both baseline and follow-up examinations. Posttraumatic stress disorder was diagnosed in 17.8 and 20.0% of burn survivors at the baseline and the 12-month follow-up assessments, respectively. Logistic regression analysis revealed that face disfigurement was the only burn characteristic significantly associated with the presence of psychiatric morbidity.

We found that major psychiatric illness were depression in 32, personality disorder in 10, schizophrenia in 5, substance disorder in 7 and Posttraumatic stress disorder in 12 cases. Ramchandran et al in their study, 114 patients admitted with suicidal burns above the age
of 15 years were included in the study. The patients were mostly married females in the 2nd to 3rd decade of life. Most of them had some form of pre-morbid psychopathology. 60% of patients had >50% burns and only 17% were survivors. After 1 year of psychotherapy, most patients had returned to normalcy.

Mechanisms of injury also vary widely among different countries and communities depending on factors like the way food is prepared, heating system, industrial environments and general living conditions. Males are strongly over-represented in burn statistics all over the world with India as the only exception; children are also at high risk, both in developed and in less developed countries. Psychosocial factors are clear risk factors for burns. The risk factors leading to individuals to burns are lower socioeconomic groups, financial loss, unemployment, illiterate, marital disputes, extremes of age groups (geriatric), sexual abuse, rape, substance use disorders and alcoholism, illnesses like diabetes, epilepsy, chronic disability, chronic pain, cancer and preexisting psychiatric illness like depression and PTSD.

Vlaeyen and Morley have noted that co-occurring pain and depression may activate cognitive processes that guide a person towards completing or terminating a task. For example, a person may terminate a functional activity as soon as he or she no longer enjoys the task, perhaps due to pain perceptions. Understanding associations between pain, depression and physical functioning is critical because burn survivors have considerable difficulties in returning to personal, social and community roles after their injuries have healed.

**Conclusion**

Authors found high incidence of psychiatric illness such as depression, personality disorder, schizophrenia and substance disorder in burn patients.

**Conflicts of Interest:** The author declare that there is no conflict of interest regarding the publication of this paper.

**Source of Funding:** Self

**Ethical Clearance:** Ethical clearance has been taken from Institutional Ethical Committee

**References**

Evaluation of Prevalence of Depression and Anxiety among Breast Cancer Patients

Sharad Vasant Kshirsagar¹, Ajay Deshmukh²

¹Associate Professor, ²Assistant Professor, Department of Psychiatry, Krishna Institute of Medical Sciences Deemed to be University, Karad, Maharashtra, India

Abstract

Background: People who have previously used psychiatric services may be particularly vulnerable and at greater risk of mortality following a cancer diagnosis. The present study assessed depression and anxiety among breast cancer patients.

Materials and Method: The present study was conducted on 64 women with breast cancer. The Patient Health Questionnaire-2 (PHQ-2) and the Generalized Anxiety Disorder-2 (GAD-2) questionnaire were produced as ultra-brief screening instruments for depression and anxiety in all patients.

Results: Age group <40 years had 12, 40-60 years had 20 and >60 years had 32 patients. The difference was significant (P< 0.05). Maximum patients were of stage III (30) followed by stage II (18), stage IV (10) and stage I (6). Treatment given was mastectomy in 46 patients and ongectomy in 18 patients. The difference was significant (P< 0.05). PHQ- 2 with score >3 was observed in 12 and GAD- 2 with score >3 was seen in 15 patients. The difference found to be significant in breast cancer patients with or without depression and anxiety (P< 0.05).

Conclusion: Authors found that breast cancer patients had higher level of depression and anxiety level.

Keywords: Anxiety, Breast cancer, depression.

Introduction

Breast cancer is the most common cancer type among females worldwide, as 1 in 8 women will be diagnosed with the disease in their lifetime. The problems experienced by survivors include physical symptoms, psychological reactions and existential concerns, which potentially disrupt their well-being. The overall prevalence of depression in oncology patients remains unclear and according to previous studies the prevalence is reported to be between 0% and 58%.¹

People who have previously used psychiatric services may be particularly vulnerable and at greater risk of mortality following a cancer diagnosis.¹ However, the mental health needs of people with cancer, with or without a prior psychiatric history, are often given little attention during and after cancer treatment, which is primarily focused on monitoring physical health symptoms and side effects.³ Advances in the earlier detection of cancer and improved cancer treatments means that people are now living longer with cancer, presenting a significant global challenge. The total number of people who are alive within 5 years of a cancer diagnosis was estimated to be 43.8 million in 2018 for 36 cancers across 185 countries. Studies have shown that prevalence of psychological distress among breast cancer patients is high and they are at higher risk of developing severe anxiety, depression and patients mood disorders. Depression and anxiety are the two most common psychiatric co-morbidities encountered.
in breast cancer patients. The present study assessed depression and anxiety among breast cancer patients.

**Materials and Method**

The present study was conducted at Krishna Institute of Medical Sciences Deemed to be University, Karad, Maharashtra, India. It comprised of 64 women with breast cancer. Ethical approval was obtained from institute prior to the study. All patients were informed regarding the study and written consent was obtained.

General information such as name, age etc. was recorded. A thorough clinical examination was done. The Patient Health Questionnaire-2 (PHQ-2) and the Generalized Anxiety Disorder-2 (GAD-2) questionnaire were produced as ultra-brief screening instruments for depression and anxiety in all patients. In both questionnaires, each question requires respondents to rate on a four-point scale ranging from “0 = not at all” to “3 = nearly every day”. PHQ-2 and GAD-2 total scores are calculated by adding the two questions score, resulting in a range from 0 to 6 for each questionnaire, with higher score indicative of higher mental health disorder. According to receiver-operating characteristic curve analysis, the optimal cutpoint is ≥ 3 on both the PHQ-2 and GAD-2 scales. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**Results**

**Table I Distribution of patients**

<table>
<thead>
<tr>
<th>Age group (Years)</th>
<th>Number</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40</td>
<td>12</td>
<td>0.01</td>
</tr>
<tr>
<td>40-60</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>&gt;60</td>
<td>32</td>
<td></td>
</tr>
</tbody>
</table>

Table I shows that age group <40 years had 12, 40-60 years had 20 and >60 years had 32 patients. The difference was significant (P< 0.05).

**Table II Assessment of parameters**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Number</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage of cancer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>6</td>
<td>0.01</td>
</tr>
<tr>
<td>II</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Table II shows that maximum patients were of stage III (30) followed by stage II (18), stage IV (10) and stage I (6). Treatment given was mastectomy in 46 patients and ongectomy in 18 patients. The difference was significant (P< 0.05).

**Table III Prevalence of Depression and Anxiety in Patients**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Number</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHQ-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 3 (presence of depression)</td>
<td>12</td>
<td>0.01</td>
</tr>
<tr>
<td>&lt; 3 (absence of depression)</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>GAD-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 3 (presence of anxiety)</td>
<td>15</td>
<td>0.04</td>
</tr>
<tr>
<td>&lt; 3 (absence of anxiety)</td>
<td>49</td>
<td></td>
</tr>
</tbody>
</table>

Table III, shows that PHQ-2 with score >3 was observed in 12 and GAD-2 with score >3 was seen in 15 patients. The difference found to be significant in breast cancer patients with or without depression and anxiety (P< 0.05).

**Discussion**

Breast cancer is the most frequently diagnosed cancer and the leading cause of cancer death in females worldwide, accounting for 23% (1.38 million) of the total new cancer cases and 14% (458,400) of the total cancer deaths in 2008. In Asia, breast cancer incidence peaks among women at the age of 40 year whereas in the United States and Europe, it peaks among women at the age of 60 year. In India pre-menopausal patients constitute about 50% of all patients. The present study assessed depression and anxiety among breast cancer patients.

We found that out of 64 patients, age group <40 years had 12, 40-60 years had 20 and >60 years had 32 patients. Srivastava et al found prevalence of anxiety and depression among the breast cancer patients was 37.0% (n=74) and 28.0% (n=56) respectively. We found strong association of anxiety with age group (p=0.014), educational level, monthly income (p=0.001) and financial support. However, marital status, monthly
income, accompanying person and financial support were significantly associated with depression. Binary logistic regression analysis shows age younger than 50 years old, those earned less income, illiterate or low level of education, being single and receiving less financial support are more likely to have anxiety. For depression, those earned less income, being single and receiving less financial support are more likely to have depression. At the 12 month follow-up, 184 breast cancer patients were re-interviewed. We found significant improvement after 12 month follow-up in both anxiety and depression level (mean anxiety level improved from 11.14 ± 4.23 to 8.64 ± 3.63 and mean depression score improved from 6.87 ± 3.11 to 5.13 ± 4.51.

We found that maximum patients were of stage III (30) followed by stage II (18), stage IV (10) and stage I (6). Treatment given was mastectomy in 46 patients and ongectomy in 18 patients.

PHQ- 2 with score >3 was observed in 12 and GAD-2 with score >3 was seen in 15 patients. The difference found to be significant in breast cancer patients with or without depression and anxiety (P< 0.05).

Tsaraset al\textsuperscript{8} found the mean age of the patients was 53.25 years, 69.7% of the patients underwent mastectomy and 30.3% ongectomy. Chemotherapy received 46.1% of patients as adjuvant mastectomy, 15.8% radiotherapy and 38.2% received both chemotherapy and radiotherapy. A large percentage found to be classified as depressed (38.2%) and anxious (32.2%) and factors that found to be associated were age, marital status, educational level, stage of cancer from univariate analyses and place of residence, religion,symptoms burden from multivariate analysis (for depression and anxiety).

Depression and anxiety are the two most common psychiatric co-morbidities encountered in breast cancer patients. Breast cancer patient may experience depression and/or anxiety at any stage of their illness from pre-diagnosis to the terminal phase of the illness. Studies in the Western countries have shown that the prevalence of depression ranges from 1% to 56%, whereas the prevalence of depression from Asian studies is between 12.5%and 31%\textsuperscript{9}.

Maasset al\textsuperscript{10} demonstrated in a very large sample of cancer patients that the prevalence of depression among breast cancer survivors was about 32.8%. It has also been reported that 40% of the patients who experience disease recurrence would suffer from anxiety and depression.

**Conclusion**

Authors found that breast cancer patients had higher level of depression and anxiety level.

**Conflicts of Interest:** The author declare that there is no conflict of interest regarding the publication of this paper.

**Source of Funding:** Self

**Ethical Clearance:** Ethical clearance has been taken from Institutional Ethical Committee

**References**


Evaluation of Incidence of Adverse Events Associated with C Section

Sanjaykumar Patil¹, Shivaji Raje², Hiren Kathiria³, Puja Priya³

¹Professor, ²Assistant Professor, ³Second Year Resident, Department of Obstetrics and Gynaecology, Krishna Institute of Medical Sciences Deemed to be University, Karad, Maharashtra, India

Abstract

Background: Cesarean section, also known as a C-section, is one of the most common operations in the world. The present study was conducted to assess adverse events associated with C sections.

Materials and Method: The present study was conducted on 438 cesarean sections. Complications and adverse events associated with C section was recorded.

Results: Age group 18-28 years had 210 patients, 28-38 years had 186 and 38-48 years had 42 patients. The difference was significant (P< 0.05). Adverse events associated with C sections was abortion in 5 cases, fetal distress in 12, malpresentations of fetus in 7, disproportion of fetus in 16, oligohydramnios in 4, preterm labor in 3 and postpartum hemorrhage in 9 cases. The difference was significant (P< 0.05).

Conclusion: Authors found that common adverse events were abortion, fetal distress, malpresentation of fetus, disproportion of fetus, oligohydramnios, preterm labor and postpartum hemorrhage.

Keywords: Cesarean section, oligohydramnios, preterm.

Introduction

Cesarean section, also known as a C-section (CS), is one of the most common operations in the world. It is a surgical procedure that may be performed to deliver one or more newborns. Taking into consideration the rate of CS is important because it reflects the index of health care coverage. Nevertheless, an “optimal” cesarean section rate remains a point of debate. The World Health Organization (WHO) stated in 1985 that the optimum rate should always remain between 10 to 15 percent.¹

The increasing caesarean section (C-section) has also been different in different countries, such that for developing countries it is much more than for developed ones. Rates of cesarean delivery continue to rise worldwide, with recent reported rates of 24.5% in Western Europe, 32% in North America and 41% in South America. Caesarean rate in Brazil, Chile and China has increased up to 40-42% while, the rate of cesarean in Iran been reported from 26- 66.5% by various studies and as 87% by some private centers. Cesarean delivery is carried out due to such various reasons as pregnancy at higher ages, lower number of a woman previous pregnancies, obesity, fetal distress, etc.²

In the presence of maternal or fetal complications, cesarean delivery can effectively reduce maternal and perinatal mortality and morbidity; however, an increasing proportion of babies are delivered by cesarean when there is no medical or obstetric indication.³ The short-term adverse associations of cesarean delivery for the mother, such as infection, hemorrhage, visceral injury and venous thromboembolism, have been minimized to the point that cesarean delivery is considered as safe as vaginal delivery in high-income countries though in

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low and middle-income countries, there is an increased risk of adverse short-term maternal outcomes even with cesarean delivery without medical indication.\textsuperscript{4} This notwithstanding, the long-term risks and benefits of cesarean delivery for mother, baby and subsequent pregnancies are less frequently discussed with women and there are few randomized controlled trials (RCTs) addressing the issue.\textsuperscript{5} The present study was conducted to assess adverse events associated with C sections.

**Materials and Method**

The present study was conducted in the department of Gynaecology at Krishna Institute of Medical Sciences Deemed to be University, Karad, Maharashtra, India. It comprised of 438 cesarean sections done in the department. All patients were informed regarding the study and written consent was obtained. Ethical clearance was obtained from institutional ethical committee.

Data such as name, age etc. was reported. Complications and adverse events associated with C section was recorded. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**Results**

**Table I Distribution of patients**

<table>
<thead>
<tr>
<th>Age Group (Years)</th>
<th>Number</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-28</td>
<td>210</td>
<td>0.01</td>
</tr>
<tr>
<td>28-38</td>
<td>186</td>
<td></td>
</tr>
<tr>
<td>38-48</td>
<td>42</td>
<td></td>
</tr>
</tbody>
</table>

Table I shows that age group 18-28 years had 210 patients, 28-38 years had 186 and 38-48 years had 42 patients. The difference was significant (P< 0.05).

**Table II Adverse events with C sections**

<table>
<thead>
<tr>
<th>Events</th>
<th>Number</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abortion</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Fetal distress</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Malpresentations of fetus</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Disproportion of fetus</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Oligohydramnios</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Preterm labor</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Postpartum hemorrhage</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

Table II shows that adverse events associated with C sections was abortion in 5 cases, fetal distress in 12, malpresentations of fetus in 7, disproportion of fetus in 16, oligohydramnios in 4, preterm labor in 3 and postpartum hemorrhage in 9 cases. The difference was significant (P< 0.05).

**Discussion**

The increase in the number of cesarean sections worldwide is related to the improvement of the access of women to this procedure when needed, but it is also related to the indiscriminate use without medical indication. This has culminated in the recent efforts to reduce these rates, while incorporating the obstetric preferences of women. Properly performed cesarean sections that follow an accurate medical indication are life-saving procedures. However, on the one hand, the provision of safe and timely cesarean sections remains a major challenge in countries with high maternal mortality, where they are insufficient; on the other hand, their excess in certain regions results in the challenge of minimizing cesarean sections without clinical indication.\textsuperscript{6}

Cesarean delivery is carried out due to such various reasons as pregnancy at higher ages, lower number of a woman previous pregnancies, obesity, fetal distress, etc. Cesareans without indications, as compared to Normal Vaginal Delivery (NVD), would bring about many complications for both mother and the baby. Many people think there is more probability of newborns health in case of cesarean, while studies have shown that the risk of death in newborns by cesarean is 4 times as much as newborns born by NVD. The most serious complications for the babies born by cesarean are fetal respiratory problems such as Transient Tachypnea (TTN) and Respiratory Distress Syndrome (RDS), surgical blade cuts and increased rates of newborns admission in the neonatal intensive care unit. Also, experts believe that 1 min Apgar score of the newborns by cesarean is less than that of the newborns by NVD.\textsuperscript{7} The present study was conducted to assess adverse events associated with C sections.

In present study age group 18-28 years had 210 patients, 28-38 years had 186 and 38-48 years had 42 patients. Zgheib et al\textsuperscript{8} determined the risk factors associated with the high cesarean section rates. This study is based on a sample of 29,270 Lebanese women who were pregnant between 2000 and 2015. Among these, 14,327 gave birth by cesarean section and 14,943 gave
of the 29,270 pregnant women included in the study, 49% had cesarean sections while 51% gave birth vaginally. Repeat cesarean section accounted for 23% while vaginal birth after cesarean accounted for only 0.2% of deliveries. In addition, weekdays were associated with a preference of providers to carry out more cesarean sections.

We found that adverse events associated with C sections was abortion in 5 cases, fetal distress in 12, malpresentations of fetus in 7, disproportion of fetus in 16, oligohydramnios in 4, preterm labor in 3 and postpartum hemorrhage in 9 cases. Mascarello et al evaluated the presence of postpartum hemorrhage and its complications, such as hysterectomy and blood transfusion and they have found controversial results. Kamilya et al found that the women with cesarean section in the absence of complications and comorbidities, presented a 3.01 times higher death rate than women with vaginal delivery. When cesarean section was intrapartum, this chance was 4.86 (95%CI 2.47–9.56) and for cesarean section before labor, this chance was not significantly higher.

Conclusion

Authors found that common adverse events were abortion, fetal distress, malpresentation of fetus, disproportion of fetus, oligohydramnios, preterm labor and postpartum hemorrhage.

Conflicts of Interest: The author declare that there is no conflict of interest regarding the publication of this paper.

Source of Funding: Self

Ethical Clearance: Ethical clearance has been taken from Institutional Ethical Committee

References

Occurrence and Dissemination of Antimicrobial-Resistant Salmonella Isolated from Diarrheic Stool Samples of Human

Abeer Mohammed Ali Al-garawy
Lecturer, Microbiology, Education for Pure Science College/Al-Muthanna University

Abstract
The current study was designed to isolate and identification of Salmonella from human stool using salmonella-shigella agar, the diagnosis of Salmonella relied on cultural properties where the Salmonella colonies on S.S. agar revealed pale with black center. Out of 72 samples were collected 59.7% were positive to Salmonella. The antibiotic susceptibility test of all positive isolates for Salmonella performed by using disk diffusion method against numerous antibiotics, The result of this test presented that the Salmonella isolates were highly resistant to Levofloxacin 43(100%), Amoxicillin/Clavulanate 40(93.0%), Streptomycin 22(51.2%), Tetracycline 19(44.2%), Imipenem 19(44.2%) and Amikacin 18(41.9%). While Salmonella isolates were moderately sensitive to Kanamycin 9(20.9%). The current study refers to Salmonella gastroenteritis treatment can be use Kanamycinas first treatment option.

Keywords: Streptomycin, Salmonella spp., S.S. agar, Plasmid.

Introduction
The microorganisms resist antimicrobial agents by many ways such as; producing hydrolyzing enzymes capable of analyzing antibiotic molecule or modulating it to inert molecules or preventing antibiotics from reaching the target it affects. Among these enzymes are beta-lactamase, which breaks down penicillins and cephalosporins groups, which are main causes of the failure of many therapeutic cases. It was found most epidemics were caused by strains producing beta-lactamase enzymes by plasmids most of them are couplings with multiple resistance characteristics, some considered it much more dangerous than resistance from chromosomal enzymes that work against β-lactam antibiotic groups[1]. The antibiotic resistance has become one of the most common problems globally on health and economic level due to seriousness of plasmids and its multiple resistance to more than one antibiotic from different groups as well as its ability to move between different isolates carrying with it resistance character[2]. Because of importance the Enterobacteriaceae therapeutically, This research focused on isolation and identification of pathogenic Salmonella from human stool, in addition to determine antibiotic susceptibility profile of the Salmonellaisolates.

Materials and Method
A total of 72 diarrheic stool samples were collected for this study. The following substances were used to isolate and diagnoses of Salmonella, furthermore test their sensitivity to antibiotics:

1. Salmonella – shigella agar (S.S. agar): Prepared according to manufacturer’s instructions and used in diagnosis of bacteria. After collection of samples, Nutrient broth (NB) used for inoculation of each sample then incubated at 370C for 24 hours, as well as, Salmonella-Shigella agar used for culture of a loop full from bacterial culture in incubated tubes, subsequently, carefully examination of plates for the existence of characteristic colonies of Salmonella[3].

2. Nutrient Agar: Prepared according to manufacturer’s instructions and used in maintaining of bacteria.

3. Antibiogram: The antibiotics used in this study comprise disks Himedia, India: Amicacine (AK), Streptomycin (S), Amoxicillin/Clavulanate (AMC), Tetracycline (TE), Imipenem (IMP), Kanamycin (KAN) and Levofloxacin (LEV). Kirby-Bauer disk diffusion method was used to evaluate the
susceptibility of *Salmonella* isolates on Mueller-Hinton agar according to CLSI[4].

4. **Preservation and maintenance of bacterial isolates**: Bacterial strains are preserved on nutrient agar slants after inoculation in 37°C for 18hr. The isolates were subculture on another new culture media for monthly maintaining. All strains are kept in the refrigerator at 4 °C. Nutrient broth added with 40 % glycerol was used For long maintenance then frozen for 6-8 months at -20 ºC [5].

**Results and Discussion**

This study showed Salmonella was found in 59.7% of the collected total samples Fig:1, the presence of turbidity in NB indicates the growth of bacteria after 24 hr. incubation at 370C. Also, the cultivation of bacteria on S.S. agar characterized by appearance of pale salmonella colonies with a black center, where the S.S. agar used to differentiate between Salmonella and Shigella from the rest of the species as this medium contains lactose sugar as a basis for differentiation between fermented and non-fermented species, the appearance of black center due to release of hydrogen sulfide and its deposition on the form Iron sulfide [6].

![Fig (1): Frequency of positive and negative infection](image1)

![Fig. (2) : Antibiotics susceptibility profile forsalamonella isolates (n=43).](image2)
All Salmonella isolates were examined for a number of the above mentioned antibiotics, it was noted that the bacteria were resistant to antibiotics as shown in Fig: 2, Amikacin 18(41.9%), Streptomycin 22(51.2%), Amoxicillin/Clavulanate 40(93.0%), Tetracycline 19(44.2%), Imipenem 19(44.2%), Kanamycin 9(20.9%) and Levofloxacin 43(100%).

The Salmonella resistance to antibiotics has been steadily increasing, numerous research related to surveillance reports revealed that Salmonella resistance phenotypes increases a two-fold from 20%-30% to about 70% during the period 1990 to 2000[7]. In this current study, we observed all Salmonella isolates were resistant to levofloxacin Fig: 2. The causes of Salmonella resistance to Levofloxacin may be due to point mutations to protect DNA gyrase or determinants of plasmid mediated resistance or efflux pumps that ejects antibiotic molecules outside the bacterial cell[8]. This type of resistance is important in public health due to latent spread among species of bacteria, in addition to fluoroquinolones resistance development among Salmonella spp. is usually slow [9]. This result poses a real risk because fluoroquinolones is one of the central drugs in the treatment of human salmonellosis. Certainly, Misuse of antibiotics, as also the use of these antibiotics frequently in food animals, pharmaceutical industries, and prophylactic. The cause of bacterial sensitivity to the mentioned antibiotics is due to several reasons, including: absence of plasmids with a definite or antibiotics-altered character, these antibiotics have not been used previously for studied bacteria, so bacteria do not have genetic genes inherited from their ancestors to resist these antibiotics and some of these antibiotics neutralize plasmid and therefore lose resistance in bacterial[10]. From the current study, we conclude that it is necessary to increase health education about the use of antibiotics properly to prevent the emergence of antibiotic resistance also to decrease the prevalence of Salmonellosis among the people to evade food borne illness. Strict health measures with proper treatment must be seriously done.

Ethical Clearance: This research underwent to the terms of ethical considerations by higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors announce that they have no conflict of interest.

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References
Impact of Serum level of L-Carnitine on Chitotriosidase in Women with Gestational Diabetes Compared to T2DM Pregnant & Non Pregnant Iraqi Women

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Abstract

Background: Gestational diabetes (GDM) was defined as any degree of glucose intolerance that to be first recognized during pregnancy, regardless of the degree of high blood sugar. L-Carnitine appeared to act as a vitamin and thus termed as vitamin B T. Under certain conditions, the demand for carnitine may exceed an individual’s capacity to synthesize it, making it a conditionally essential nutrient. Whereas, chitotriosidase is chitinase family member enzyme, produced by activated macrophages. Enzymatic activity of chitotriosidase increases significantly during the development of acute or chronic disorders.

Aim: The study involved estimating serum level of L-carnitine & activity of chitotriosidase in women with gestational diabetes compared to type-2 diabetic pregnant & non pregnant Iraqi women. In addition to assessing the possible impact of variations of serum level of carnitine on serum chitotriosidase activity in the study groups.

Methodology: This is a case control study included seventy-five women whom attending the Al Alwaiya Maternity Teaching Hospital/Baghdad-Iraq. The participants were selected of similar age consisted of three groups: 25 pregnant women with gestational diabetes, 25 pregnant women with type 2 diabetes, and 25 healthy non pregnant women as a control. After the provision of the ethical approval from Ethics Committee of the Collage of Pharmacy–University of Baghdad. The studied biochemical markers were: total HbA1c, lipid profile, serum L-carnitine & chitotriosidase.

Results and Discussion: Data analysis for comparing the groups results (gestational diabetes, T2DM and control) indicated significant variations among them considering serum carnitine levels & chitotriosidase activity. However, HbA1C levels were positively correlated with L-carnitine among GDM pregnant women, with highest levels compared to the control & T2DM pregnant women. However, serum carnitine levels were significantly correlated with chitotriosidase activity among GDM pregnant specifically (r=-0.813, p=0.0001).

Conclusion: Serum carnitine level was significantly lowered in T2DM pregnant women, as well as in pregnant women with GDM, as being compared to healthy non pregnant women. Whereas, serum chitotriosidase level were significantly elevated in women with GDM, in comparison to T2DM and controls, it’s activity is negatively correlated with serum carnitine level.

Keywords: L-Carnitine, Chitotriosidase, Gestational Diabetes, T2DM.

Introduction

Gestational diabetes (GDM) was defined as any degree of glucose intolerance that was first recognized during pregnancy, regardless of the degree of high blood sugar. As well as diabetes mellitus which is referred to as; a metabolic disorder characterized by a high blood sugar due to defective insulin action1. Degree of hyperglycaemia and insulin resistance (specifically
Normally, in type 2 diabetes seem to be at elevated risk for carnitine deficiency. L-carnitine short-circuit the Randle cycle by sequestering inhibitory acetyl-CoA units as acetyl-Carnitine and concomitantly increasing free CoA levels. Lowering of the mitochondrial acetyl-CoA: CoA ratio would then favour glucose oxidation, L-carnitine mediated sequestering of toxic lipid metabolites may have benefited both mitochondrial performance and insulin signalling. Also L-Carnitine can play a role in the treatment of type 2diabectics by improving insulin resistance that is caused by post-receptors defect, this means that L-Carnitine may be useful for cell membrane repairing and, removal of harmful lipid from the cells may improve or decrease the resistance to insulin action by photoreceptor defect either at the membrane or intracellular level, Administration of L-Carnitine may shift the metabolic bias of the liver away from esterification and synthesis of triglycerides toward the formation of acetylcarnitines. This could decrease synthesis of triglycerides and VLDL cholesterol and likely increase mitochondrial β-oxidation of fatty acids.

Generally there are two types of carnitine deficiency. Primary carnitine deficiency; which is a genetic disorder of the cellular carnitine transport system that usually manifests itself with five years with symptoms of cardiomyopathy, skeletal muscle weakness and hypoglycaemia. A secondary deficiency of carnitine may be caused by certain disorders (such as chronic kidney failure) or under certain conditions (such as the use of some antibiotics) that reduce carnitine absorption or increase its secretion. There is scientific agreement on the value of carnitine as a prescription product for treating such deficiencies. Beyond its classical physiological role, carnitine has additional crucial functions in the body. Notably, carnitine modifies the acyl-CoA/CoA ratio, which in turn regulates the activity of several mitochondrial enzymes involved in tricarboxylic acid cycle (TCA), fatty acid oxidation, urea cycle and gluconeogenesis. It has also been shown that there are anti-inflammatory and antioxidant properties possessed by L-carnitine. It improves dyslipidemia, membrane stability, protein nutrition and insulin sensitivity.

On the other side, chitotriosidase is chitinase family member enzyme and produced by macrophage cells after activation, which show a class of evolutionarily ancient enzymes that catalyze the hydrolysis of chitin to simple sugars. Chitin is a linear homopolymer and the most abundant natural biopolymer known for being the structural component of protective structures in many eukaryotic organisms, but not be seen in vertebrates. Because of excess serum levels or increased expression in chronically inflamed tissues chitotriosidase undergoes increased scrutiny.

The enzymatic activity of chitotriosidase increases significantly during the development of acute and chronic disorders. During the active maturation of monocyes into macrophages, there is a different role for this enzyme in macrophages. Through the various stages of macrophage maturation, the levels of chitotriosidase increases significantly when modified into macrophage M1 and M2 macrophages. There is ample evidence to indicate the active role of chitotriosidase in cases of disease characterized by an inflammatory response. Patients with newly diagnosed, untreated, and uncomplicated type 2 DM have been observed to have increased chitotriosidase activity. Interestingly, it indicated that there is a new group of molecules of derivative chitinases, which may participate in inflammatory pathways in the context of type 2 diabetes and metabolic disorders, especially with regard to the development of vascular complications. It showed that the increase in chitotriosidase levels is linked to other biochemical pathways that occur in diabetes. Although...
neutrophils are involved in the inflammatory response in type 2 diabetes, macrophages are the primary cell type in the response. One of the important factors in vascular damage in diabetes is the employment of neutrophils in fatty tissues and the lining, where enzymes are released and many proinflammatory mediators, under prolonged hyperglycemia conditions, it might lead to functional impairment of neutrophils. Furthermore, some scientists hypothesized that there is a role or participation of chitotriosidase in the development of atherosclerosis, which creates a possible link to the course of type 2 diabetes. Type 2 diabetes, which results from insulin resistance or lack of it, as it is associated with many metabolic abnormalities such as obesity, dyslipidemia, and high blood sugar. These are main systemic factors, which trigger proinflammatory events, leading to endothelial dysfunction and increased prevalence of diabetic angiopathies. Moreover, it is positive association with parameters for controlling blood sugar and blood pressure, may enable the prediction of the risk of diabetic angiopathies.

Materials and Method

Subjects: A total number of seventy five women were enrolled in this study from those attending Al Alwaiya Maternity Teaching Hospital/Baghdad-Iraq, for the period from October/2019 until March/2020. Including (25) women diagnosed to have GDM (as Group-1). Besides (25) pregnant women have type 2 DM (as Group- 2).The diagnosis was made by a specialized physician according to the American Diabetes Association (ADA) criteria. A third group of apparently healthy (non-pregnant) women, whom were age matching for the patients groups to be included as a control (as Group-3) the characteristics of subjects are summarized in (Table-1). After obtaining the ethical approval from the Ethical committee of the Collage of Pharmacy/University of Baghdad.

All participants completed pre-interview questionnaire regarding family history of diabetes and medical history, other information were collected from hospital records to identify diabetes and treatment protocol.

The samples were collected by withdrawing blood specimen (5 ml) from each woman to obtain serum. Testing for HbA1C by taking (2ml) of blood to be placed into EDTA tube. The rest of blood used to obtain serum to measure glucose concentration. The reminder of serum was separated and divided into aliquots into Eppendorf tubes, which were kept frozen at 20 degrees until analysis.

<table>
<thead>
<tr>
<th>Type</th>
<th>Control (25)</th>
<th>GDM (25)</th>
<th>T2DM (25)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean±SEM</td>
<td>Mean±SEM</td>
<td>Mean±SEM</td>
</tr>
<tr>
<td>Age (yrs)</td>
<td>25.04±1.20</td>
<td>29.20±1.31</td>
<td>27.04±1.34</td>
</tr>
<tr>
<td>HT(Cm)</td>
<td>162.32±1.20</td>
<td>167.48±1.51</td>
<td>166.52±1.12</td>
</tr>
<tr>
<td>WT(kg)</td>
<td>63.92±1.37</td>
<td>73.96±1.52</td>
<td>72.88±1.34</td>
</tr>
<tr>
<td>Chol (mg/dl)</td>
<td>185.28±6.80</td>
<td>230.04±4.50</td>
<td>203.68±8.69</td>
</tr>
<tr>
<td>VLDL (mg/dl)</td>
<td>33.96±2.71</td>
<td>35.28±1.63</td>
<td>35.28±1.63</td>
</tr>
<tr>
<td>LDL (mg/dl)</td>
<td>196.32±8.55</td>
<td>217.36±243.04</td>
<td>217.36±9.02</td>
</tr>
<tr>
<td>HDL (mg/dl)</td>
<td>22.92±1.27</td>
<td>21.40±0.74</td>
<td>21.40±0.74</td>
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<tr>
<td>HbA1c (%)</td>
<td>5.13±0.31</td>
<td>6.31±1.12</td>
<td>4.43±0.82</td>
</tr>
<tr>
<td>BMI (kg/m)</td>
<td>24.42±0.56</td>
<td>26.26±26.44</td>
<td>26.26±0.38</td>
</tr>
</tbody>
</table>

Laboratory analysis: Serum components of lipids [total cholesterol (TC), triglyceride (TG) & HDL-cholesterol (HDL-C)] was measured colorimetrically. Glycated hemoglobin measurement was done according to (Bun H). Serum L-carnitine; was measured using ELISA kit purchased by (Sun Long Biotech/China). Whereas, the measurement of serum chitotriosidase was based on sandwich-ELISA principle (Elabscience/China).
Statistical Analysis: Statistical package for social sciences version 25 (SPSS v. 25) was applied for data input and analysis. Analysis of Variance (one-way): to determine the difference in means of 3 independent samples, followed by Tukey’s test (post-hoc test) to identify significantly different means among the groups. Pearson’s correlation coefficient (r): to evaluate the correlation between the parameters. All the results with (P<0.05) were considered to be significant.

Results

Serum Lipoproteins Levels Among Studied Groups: The mean value of serum total cholesterol concentrations for GDM was significantly higher than that of the control and T2DM. Meanwhile, mean value of serum LDL concentrations for GDM patients was significantly higher than control and T2DM. Although, VLDL mean value was higher in T2DM than that of the control and GDM but these values were not significantly elevated. While, the HDL mean value was higher in the control as compared to that of the T2DM and GDM but not to a significant level. The complete details of these results are presented in (figure -1).

![Serum lipid profile](image1)

*Highly significant difference (P< 0.01).

**Figure 1: Mean Values of Serum Lipid Concentration(mg/dl) Plot for Control, GDM and T2DM Groups**

![L-carnitine values](image2)

**Figure 2: Mean Serum L-carnitine Values (pg/ml) among The Control, GDM and T2DM Groups**
**Hb\textsubscript{A1C} concentrations Among Studied Groups:** The mean value of blood Hb\textsubscript{A1C} concentrations for GDM patients was significantly higher than control subjects and T2DM patients as shown in (Table-1).

**Serum L-carnitine concentrations Among Studied Groups:** The mean values of serum L-carnitine concentrations for control was significantly higher than T2DM and GDM patients as illustrated in table (Figue-2).

**Mean Serum Chitotriosidase Concentrations for Studied Groups:** The mean values of serum chitotriosidase concentrations for GDM group was significantly higher than the control and T2DM, as illustrated in (Figure-3). Plasma chitotriosidase activity in patients with ongoing type 2 diabetes were described to have a relationship with anthropometric and metabolic parameters related to the diabetic state.

![Image](image_url)

**Figure 3:** Mean Values of Serum Chitotriosidase levels (pg/ml) in Control, GDM and T2DM Groups

**Correlation Studies Results:**

The following tables were summarized the results:

**Table 2:** Summary of Pearson’s Correlations of Serum L-Carnitine Level with The Studied Parameters in GDM Group

<table>
<thead>
<tr>
<th></th>
<th>L-Carnitine</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c</td>
<td>Pearson Correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Cho</td>
<td>Pearson Correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>TG</td>
<td>Pearson Correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Parameter</td>
<td>Pearson Correlation</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------</td>
</tr>
<tr>
<td>VLDL</td>
<td>0.000</td>
</tr>
<tr>
<td>HDL</td>
<td>-0.009</td>
</tr>
<tr>
<td>LDL</td>
<td>0.343</td>
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Table 3: Summary of Pearson’s Correlations of Serum L-Carnitine Level with the Studied Parameter in T2DM Group

<table>
<thead>
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<th>Parameter</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c</td>
<td>-0.033</td>
<td>0.877</td>
<td>25</td>
</tr>
<tr>
<td>Cho</td>
<td>0.128</td>
<td>0.543</td>
<td>25</td>
</tr>
<tr>
<td>TG</td>
<td>0.336</td>
<td>0.100</td>
<td>25</td>
</tr>
<tr>
<td>VLDL</td>
<td>0.331</td>
<td>0.106</td>
<td>25</td>
</tr>
<tr>
<td>HDL</td>
<td>0.147</td>
<td>0.483</td>
<td>25</td>
</tr>
<tr>
<td>LDL</td>
<td>0.161</td>
<td>0.442</td>
<td>25</td>
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</tbody>
</table>

Table 4: Summary of Pearson’s Correlations of Serum Chitotriosidase Level with The Studied Parameter in GDM Group

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c</td>
<td>-0.369</td>
<td>0.069</td>
<td>25</td>
</tr>
<tr>
<td>Cho</td>
<td>-0.174</td>
<td>0.406</td>
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<tr>
<td>Cho</td>
<td>-0.174</td>
<td>0.406</td>
<td>25</td>
</tr>
<tr>
<td>Parameter</td>
<td>Pearson Correlation</td>
<td>Sig. (2-tailed)</td>
<td>N</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------</td>
<td>----------------</td>
<td>----</td>
</tr>
<tr>
<td>TG</td>
<td>-0.110</td>
<td>0.602</td>
<td>25</td>
</tr>
<tr>
<td>VLDL</td>
<td>-0.102</td>
<td>0.628</td>
<td>25</td>
</tr>
<tr>
<td>HDL</td>
<td>0.165</td>
<td>0.430</td>
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</tr>
<tr>
<td>LDL</td>
<td>-0.259</td>
<td>0.211</td>
<td>25</td>
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Table 5: Summary of Pearson’s Correlations of Serum Chitotriosidase Level with The Studied Parameter in T2DM Group

<table>
<thead>
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<th>Parameter</th>
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</thead>
<tbody>
<tr>
<td>HbA1c</td>
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<td>0.606</td>
<td>25</td>
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<tr>
<td>Cho</td>
<td>0.387</td>
<td>0.056</td>
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<tr>
<td>TG</td>
<td>0.141</td>
<td>0.502</td>
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</tr>
<tr>
<td>VIDL</td>
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<tr>
<td>HDL</td>
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<tr>
<td>LDL</td>
<td>0.407**</td>
<td>0.044</td>
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</table>

*Significant correlation (P<0.05)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Carnitine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2DM</td>
<td>.008</td>
<td>.971</td>
<td></td>
</tr>
<tr>
<td>GDM</td>
<td>-.813**</td>
<td>.000</td>
<td></td>
</tr>
</tbody>
</table>

*Highly significant correlation (P<0.01)
Diabetes or impaired glucose tolerance develops in 2-3 percent pregnant women, previously non-diabetic, most often in the last trimester of pregnancy. Which is referred to as Gestational Diabetes Mellitus (GDM). The insulin resistance of normal pregnancy may also contribute to GDM in women in whom the capacity for insulin secretion is not sufficient to meet the increased insulin demands of pregnancy lipid abnormalities in patients with diabetes, “diabetic dyslipidemia”, are typically characterized by high total cholesterol (T-Chol), high triglycerides (Tg), low high density lipoprotein cholesterol (HDL-C) and increased levels of small dense LDL particles. Low density lipoprotein cholesterol (LDL-C) levels may be moderately increased or normal. Lipid abnormalities are common in people with T2DM and prediabetes. One of the major features of DM that is closely and causatively related to its macrovascular complications is diabetic dyslipidemia (DD). Type 2 diabetes is associated with a cluster of interrelated plasma lipid and lipoprotein abnormalities, including reduced HDL cholesterol, a predominance of small dense LDL particles, and elevated triglycerides. These abnormalities occur in many patients despite normal LDL cholesterol levels. These changes are also a feature of the insulin resistance syndrome (also known as the metabolic syndrome), which underlies many cases of type 2 diabetes. In fact, pre-diabetic individuals often exhibit an atherogenic pattern of risk factors that includes reduced HDL cholesterol, a predominance of small dense LDL particles, and elevated triglycerides. These abnormalities occur in many patients despite normal LDL cholesterol levels.

In patients with diabetes, cholesterol metabolism differs from nondiabetic patients because cholesterol synthesis is high and is reduced by insulin. According to our study the results showed that GDM was associated with increased cholesterol. This is what was previously confirmed.

Low density lipoprotein –Cholesterol (LDL-C) is one of the main factors for assessment of cardiovascular disease risk and it is more important in diabetic patients. Various method are currently used for LDL-C measurements which are compared in this study. Patients with diabetes frequently have lipid profiles that appear more benign than those of other high-risk people without diabetes. In general, LDL cholesterol levels in people with diabetes are not higher than those in people without diabetes who are matched for age, sex, and body weight (Figure-1). Nonetheless, LDL cholesterol does not play less of a role in cardiovascular risk in people with type 2 diabetes. A large number of small, dense particles characterize the LDL fraction in diabetic individuals. These particles contain less cholesterol than normal-sized LDL particles, but they are exceptionally atherogenic. Thus, levels of LDL may appear deceptively “normal” in cholesterol measurements. According to our study, the results showed that GDM was associated with increased LDL (Figure-1).

HDL is formed from lipid-free Apo-AI, which is synthesized de novo by the liver, or released from triglyceride-rich lipoproteins particles. Diabetes is associated with quantitative changes in the amount of circulating lipids – notably an increase in triglycerides, elevated LDL and a reduction in HDL. Like other lipoproteins, HDL also undergoes significant qualitative changes in diabetes, in both structure and function. However, since dyslipidemia may be present several years before the onset of diabetes, it is hard to determine which of these changes are related to the pathognomonic features of the disease, and which precede and accelerate its progression. HDL is known to be inversely correlated with cardiovascular disease due to its diverse antiatherogenic functions. These functions include cholesterol efflux and reverse cholesterol transport, antioxidative and anti-inflammatory activities. Cholesterol that reaches HDL particles is converted to cholesteryl esters by the HDL-associated enzyme lecithin-cholesterol acyltransferase (LCAT). In fact, the role of cholesterol metabolism and HDL function in the pathogenesis of Type 2 diabetes mellitus (T2DM) has recently gained a lot of attention. Native Americans carrying the R230C mutation in ABCA-1, which is associated with decreased cholesterol efflux capacities, were shown to be more prone to early age T2DM. Mice studies suggest that cholesterol accumulation in islet β-cells is the reason for their pathology. HDL also appears to protect β-cells from the toxic effects of glucose and IL-1β, and to enhance insulin secretion. In skeletal muscles, HDL was demonstrated to increase insulin activity in the form of glucose uptake. This activity was dependent on ABCA-1 activity, and included activation of AMP kinase. According to our study, the results showed that GDM was associated with increased HDL (Figure-1).

It has been shown that the VLDL production rate is correlated with insulin resistance and liver fat in patients with type 2 diabetes. Dyslipidemia is a key feature of T2DM, and may precede it by several years. Diabetic
dyslipidemia is characterized not only by a change in the levels of lipoproteins and the ratio between them, but also by changes in the structure of the lipoproteins themselves. The increase in VLDL and triglycerides presents as an increase in VLDL1 production. The normal suppressant effect of insulin on postprandial VLDL (more specifically, VLDL₄) production is blunted by hepatic insulin resistance⁴². According to our study, the results showed that GDM was associated with increased VLDL. This is what was previously proven.

Glycated hemoglobin (HbA1c) has been widely accepted as an indicator used to evaluate the blood glucose control in diabetes mellitus (DM) patients. However, evidence on the application of HbA1c in the diagnosis and follow up of gestational diabetes mellitus (GDM) and pregnancy combined DM is very poor. Herein, we summarize the available studies on this issue. In 2017, the International Diabetes Federation (IDF) estimated that there are 451 million people aged 18-99 years with diabetes mellitus (DM) worldwide, and that this will only increase to 693 million by 2045⁴³. The major advantage of HbA1c is that it is less affected by fluctuating glucose levels after meals and other short-term changes from medical conditions. However, there are still several factors that can affect HbA1c results. Haemoglobin (Hb) variants (including elevated levels of HbF) and thalassemia can affect HbA1c results, with the interference from Hb variants more pronounced in ion exchange method. This can cause falsely high/low HbA1c levels, depending on the manufacturer. In a recent study⁴⁴, HbA1c levels decrease during early pregnancy due to increased erythrocyte synthesis and decreased fasting blood glucose levels due to insulin-independent glucose uptake by the fetus and placenta. However, later in pregnancy, postprandial hyperglycemia, insulin resistance and increased carbohydrate intolerance develop due to diabeticogenic placental hormones⁴⁵. If GDM is treated intensively during the entire period of pregnancy, HbA1c may not be able to accurately diagnose diabetes at follow up shortly after giving birth⁴⁶. The screening for GDM later in pregnancy is performed between 24-28 weeks gestation, and many guidelines still recommend either one-step or two-step glucose challenge tests to screen for GDM, with diagnostic criteria based on OGTT results⁴⁷. Six Arab speaking countries namely; Saudi Arabia, Kuwait, Qatar, Lebanon, Bahrain and United Arab Emirates are among the world’s top countries with the highest prevalence of type 2 Diabetes mellitus (T2DM) affecting 32.8 million people in 2011, which is expected to increase to 60 million by 2030. Diabetes affects almost every organ of the body and causes serious complications like stroke, heart attack, kidney disease, gangrene 4 blindness and renal failure⁴⁷. Pre-existing diabetes (both type 1 and type 2) is associated with an increased risk of stillbirth. How about the relation between HbA1c and stillbirth? Tennant et al found increasing periconception HbA1c concentration above values of 49 mmol/mol (6.6%) was significantly associated with either fetal death or infant death with each 1 mmol/mol increase (above 49 mmol/mol) conferring a 2% and 3% relative increase, respectively. Table-1 presents that GDM pregnant women mean HbA1C value was significantly higher than the control & even the pregnant T2DM women.

GDM carries risks for the mother, fetus, and neonate. The Hyperglycemia and Adverse Pregnancy Outcome (HAPO) study found that there are wide-ranging and multinational scientific studies that included more than 23,000 pregnant women, which demonstrated that the risk of harmful results for the mother, the fetus and the newborn increases continuously as a function of maternal blood sugar in 24-28 weeks of pregnancy, even within the ranges that were previously considered the nature of pregnancy. There is no limit to the risk of complications and many results have led to a review of the diagnostic criteria for GDM patients⁴⁹.

Discussions and disagreements about the optimal strategies for diagnosing GDM due to the different diagnostic criteria that define different degrees of hyperglycemia in mothers. Figure-2 illustrated that serum carnitine levels were significantly lowered in pregnant diabetic (GDM & T2DM) compared to the non-pregnant control women.

Chitotriosidase is chitinase family member enzyme and produced by macrophages after activation ¹⁴, which catalyzes the hydrolysis of chitin to simple sugars. There is little evidence showing that serum CHIT1 activity is increased in patients with newly diagnosed, untreated, and uncomplicated type 2 DM (T2DM)²¹. Type 2 diabetes, the most common form of diabetes, results from insulin resistance and/or deficiency and is connected with many metabolic abnormalities, such as hyperglycemia, obesity, hypertension, and dyslipidemia. These are main systemic factors, which trigger proinflammatory events, leading to endothelial dysfunction and increased prevalence of diabetic angiopathies (DA) in T2D diabetic patients. Diabetic...
angiopathies are the major cause of decreased quality of life and increased mortality of T2D, remaining a constant target of diagnosis, monitoring and treatment\textsuperscript{25}. As data shown in Figure-3, serum chitotriosidase level was significantly elevated over that of control & T2DM groups, furthermore chitotriosidase level in GDM group was inversely correlated with carnitine level (r=-0.813, p˂0.0001) compared to T2MD group which presented with no such correlation (r=0.008, p>0.05).

**Conclusion**

serum carnitine level was significantly lowered in T2DM pregnant women, as well as in pregnant women with GDM, as being compared to healthy non pregnant women. Whereas, serum chitotriosidase level were significantly elevated in women with GDM, in comparison to T2DM and controls.

**Source of funding/University of Baghdad:**

College of Pharmacy

**Conflict of Interest:** Nil

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Socio-Epidemiological Study of Infectious Skin Diseases among School Children in Heet District, Iraq

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Abstract

Background: The “skin diseases” are transmissible in the developing world, especially the school students.

Aim: To shed light the prevalence of “infectious skin diseases” among school children in Heet District and the possible correlated of different socio-demographic factors.

Method: A cross-sectional descriptive study conducted from the October 2018 to December 2019 on schools children in Heet District, Alanbar Governorate, Iraq to explore the prevalence of “infectious skin diseases” and its relationship with different socio-demographic variables. A total of 2971 school children were incorporated into this study. There were 1446 females and 1525 males. The pupils living in urban areas were 1453 while those living in rural areas were 1518. The full dermatological examination was done, for the existence of any infectious skin disease.

Results: The prevalence rate of transmissible skin diseases was 30.6%. It is significantly higher among male pupils (21.9%); between 12-14 years (20.3%); rural residence(27.1%); pupils of primary schools (25.4%); low economic status in 20%; crowding index 3 in (24%); primary educational level of a father (31.1%) and mother (23%) of pupils. The viral infections (16.7%) are the more prevalent, followed by bacterial (13.4%), fungal (2.2%) and parasitic skin infections (1.9%).

Conclusions: Infection of the skin is very common in children. The viral one is more prevalent. The rural area, crowding houses, low economic status and the parent’s educational level were significantly associated with the prevalence of “infectious skin diseases”.

Keywords: Infectious, skin diseases, pupils, schools, children.

Introduction

In developing countries, the “skin diseases” are very common, predominately infections and infestations, and they are most common among the younger age group. They can affect more than 60% of the general population and usually are not well managed.¹² Special consideration to the school students, because of their vital importance to the health of the community and they are an important sector of any community. Children within the school environment are vulnerable to cross-transmission of communicable “skin diseases” among themselves and their families.³⁴ In Iraq, the prevalence of “skin diseases” were 8.8% and 33.7% for transmissible and non-transmissible skin diseases respectively. The prevalence of skin diseases in rural areas of Erbil governorate is one of the great public health problems.⁵⁶

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National variations within one country like the genetic factors, environment, race, occupation, nutrition and habits can influence the pattern of “skin diseases”. This study was designed to highlight the current spectrum and prevalence of the “infectious skin diseases” among “school children” in Heet district and the possible association of different socio-demographic correlates with the prevalence of transmissible “skin diseases”.

Material and Method

A “cross-sectional study” conducted in Heet District, Alanbar Governorate, Iraq and implemented with “a multistage cluster random sampling”. The population subjected for this study was the pupils registered in the primary and intermediary schools of Heet District. The study was performed during the period between October 2018 till December 2019.

There were (129) primary schools and (48) intermediary schools distributed over the whole area of Heet District including the Heet City Center, the towns and villages that belong to the District.

The schools were divided according to the age into primary schools (6-8, and 9-11 years old) and intermediary schools (12-14 years old); then, each of them was further divided according to gender. Furthermore, all these divisions were classified into urban schools and rural schools.

The schools were chosen by simple random sampling among the schools of each location using proportionate sampling techniques. A full history and clinical dermatological examination were done in the room of the headmaster of each school and in the presence of the headmaster and the director teacher of each class about the possibility of having any signs or symptoms of an “infectious skin diseases”, including bacterial, viral, fungal, and parasites skin infections. The dermatological examination was done by 2 specialists in dermatology. Swab and direct examination were done for inquiry cases of bacterial and fungal infection.

A self-administered questionnaire was distributed to all chosen pupils to be answered and filled by the head of their families. The information requested in the questionnaire included the age, sex, number of family members, number of rooms, educational level of father and mother, and the economic status of the family (perceived). The children were asked to bring written consent from their parents for participation in the study. This study was approved by the Ethics Approval Committee, College of Medicine, University of Anbar (Ref. No 25/22-4-2020).

The data were analyzed using the programs: Excel 2010 and SPSS version 22. The Chi-squared test and Yate’s correction is used. The $P$-value of $\leq0.05$ is considered as significant.

Results

A total of 2971 pupils were included. Their age ranged between 6-14 years with a mean ±SD of 10.2 ± 2.7 years. The overall prevalence of “infectious skin diseases” was 909 (30.6%) patients, including viral (16.7%), bacterial (13.4%), fungal (2.2%) and parasitic (1.9%).

The distribution of biological causative agents of “infectious skin diseases” according to age groups showed statistically significant difference at an age between 12-14 with the rate of bacterial, viral, fungal and parasitic infections $(P<0.001)$. The viral infection was significantly encountered more than others “infectious skin diseases” in general and in each studied age groups (Table 1).

The rate of bacterial, and fungal “skin infections” was significantly higher among male pupils in (8.3% and 1.5% respectively), while in the females (5.1% and 0.6% respectively) $(P<0.001)$. While the rate of “viral skin infection” was non-significantly higher among the male pupils (8.9%) compared to that in the females (7.8%) (Table 1).

The distribution of biological agents of the bacterial, fungal and parasitic infection among pupils living in the rural area were (8.3%, 1.4%, and 1.2%) of children respectively, and showed significantly higher rates compared to those living in an urban area (5.1%, 0.6%, and 0.6%) of children respectively.

The crowding index of £3 associated with a significant difference in the prevalence of bacterial infections 8.1% and viral infections 13.3% of children $(P<0.0001)$. In the other hand, there was no statistically significant difference in the rate of fungal or parasitic infections in the school children living in a family with crowding index of $(>3)$ or $(\leq3)$ (Table 1).

This study showed the highest statistically significant prevalence of bacterial, viral, fungal and parasitic infections, among pupils having father and mother
education of primary or secondary school (P<0.05), while the lowest rate of diseases was detected among pupils whose fathers were illiterate or had a higher level of education.

Concerning the economic status of the, this study revealed that the rate of bacterial (7%), viral (8.7%), fungal (1.3%) and parasitic (1%) infection were significant in families with a low economic state (Table 1).

A higher significant prevalence rate of bacterial, viral and parasitic infection (9.8%, 10.9%, and 1.4% respectively), among pupils of primary school level than that from secondary school level (3.7%, 5.8%, and 0.5%) (P<0.0001). While the fungal infection was not statistically significant (P=0.803), concerning the school levels (Table 2).

Table 1 showed the distribution of specific bacterial, viral, fungal and parasitic skin disease.

<table>
<thead>
<tr>
<th>Table 1: The prevalence of biological causative agents of infectious skin diseases among school children according to socio-demographic variables n=909</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age group</strong></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>6-8</td>
</tr>
<tr>
<td>9-11</td>
</tr>
<tr>
<td>12-14</td>
</tr>
<tr>
<td>P-value</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>P-value</td>
</tr>
<tr>
<td><strong>Residence</strong></td>
</tr>
<tr>
<td>Urban</td>
</tr>
<tr>
<td>Rural</td>
</tr>
<tr>
<td>P-value</td>
</tr>
<tr>
<td><strong>Crowding index</strong></td>
</tr>
<tr>
<td>£3</td>
</tr>
<tr>
<td>&gt;3</td>
</tr>
<tr>
<td>P-value</td>
</tr>
<tr>
<td><strong>Educational level of father</strong></td>
</tr>
<tr>
<td>Illiterate</td>
</tr>
<tr>
<td>Primary</td>
</tr>
<tr>
<td>Secondary</td>
</tr>
<tr>
<td>High</td>
</tr>
<tr>
<td>P-value</td>
</tr>
<tr>
<td><strong>Educational level of mother</strong></td>
</tr>
<tr>
<td>Illiterate</td>
</tr>
<tr>
<td>Primary</td>
</tr>
<tr>
<td>Secondary</td>
</tr>
<tr>
<td>High</td>
</tr>
<tr>
<td>P-value</td>
</tr>
<tr>
<td><strong>Economic status of family</strong></td>
</tr>
<tr>
<td>Low</td>
</tr>
<tr>
<td>Medium</td>
</tr>
<tr>
<td>High</td>
</tr>
<tr>
<td>P-value</td>
</tr>
<tr>
<td><strong>Educational level of pupil</strong></td>
</tr>
<tr>
<td>Primary</td>
</tr>
<tr>
<td>Secondary</td>
</tr>
<tr>
<td>P-value</td>
</tr>
</tbody>
</table>
Table 2: Frequency of specific infectious skin diseases among school children.

<table>
<thead>
<tr>
<th>Infectious skin disease</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacterial (13.4%)</td>
<td>Traumatic Wound infection 330(11.11)</td>
</tr>
<tr>
<td></td>
<td>Folliculitis 60(2.02)</td>
</tr>
<tr>
<td></td>
<td>Impetigo 9(0.3)</td>
</tr>
<tr>
<td>Viral (16.7%)</td>
<td>Warts 273(9.19)</td>
</tr>
<tr>
<td></td>
<td>Herpes simplex 217(7.3)</td>
</tr>
<tr>
<td></td>
<td>Chicken pox 7(0.24)</td>
</tr>
<tr>
<td>Fungal (2.2%)</td>
<td>Tinea versicolor 42(1.41)</td>
</tr>
<tr>
<td></td>
<td>Tinea capitis 12(0.4)</td>
</tr>
<tr>
<td></td>
<td>Tinea corporis 4(0.14)</td>
</tr>
<tr>
<td></td>
<td>Tinea pedis 3(0.1)</td>
</tr>
<tr>
<td></td>
<td>Tinea facii 3(0.1)</td>
</tr>
<tr>
<td>Parasitic (1.9%)</td>
<td>Cutaneous leishmaniasis 39(1.31)</td>
</tr>
<tr>
<td></td>
<td>Scabies 12(0.4)</td>
</tr>
<tr>
<td></td>
<td>Pediculosis capitis 6(0.2)</td>
</tr>
</tbody>
</table>

Discussion

School children have been identified by many socio-epidemiological surveys to be at risk for exposure to various infectious skin diseases.

The present study revealed that the overall prevalence of “infectious skin diseases” among school children is 30.6%. This finding is slightly higher than that detected in previous reports in Ibadan, Nigeria (24.6%), Saudi Arabia (27.2%). Meanwhile this finding is lower than that detected in Sagamu, Nigeria 36.9%. In Iraq, a study conducted by Khalifa found that 8.8% of the school children were diagnosed as “infectious skin diseases”.

The high prevalence of “infectious skin diseases” in “school children” in the present study might be explained by the poor personal hygienic and sanitary conditions, lack of awareness and health services. Other studies stated that differences in socioeconomic standards, even within the country may be responsible for great variations in the prevalence of “skin diseases”.

This report showed that there is a significant difference in the different age groups with a significant correlation was found among the age group 12-14 years old of children. This is in disagreement with the other studies conducted in Iraq. This finding gives an idea that this age group of “schoolchildren” are exposed more to the “infectious skin diseases” since they receive the same health care facilities, they can explain their complain and have nearly the same personal hygiene.

This study found that the prevalence of the rate of bacterial, and fungal infections” was significantly higher among male pupils than females. This finding is consistent with many studies conducted in different countries. While other studies found a higher prevalence of “infectious skin diseases” among females than in males. The male preponderance in this study might be explained by the dominant active role of this gender in the study population. Also, the population in the Iraqi society take care and attention to the females.

This report revealed that there is a significant association between residency and the prevalence of the bacterial, fungal and parasitic infection among pupils living in the rural area in (8.3%, 1.4%, and 1.2%) of children respectively, than in urban “school children”. This finding is in agreement with other reports. This may be related to the bad living condition, lack of therapy and a lack of cooperation between health and teaching authorities.

According to this study, the prevalence of bacterial 8.1% and viral infections 13.3% of children with crowding index \( \leq 3 \) is significantly higher than that detected among school children with crowding index
>3 (5.4% and 5.3% respectively). In the other hand, the crowding index of (>3) or (≤3) had no significant difference in the rate of fungal or parasitic infections in the school children. This may be explained by the high contagious rate of bacteria and virus than fungus and parasite.

In contrast to this finding, in Iraq, Khalifa found a significantly higher prevalence of “infectious skin diseases” among “school children” living in families with crowding index >3 (12.1%). In Saudi Arabia, Amin found that large family size was the predictor risk factor for some transmissible “skin infections” (pediculosis and tinea). The unexpected of this study data may be due to incorrect crowding index information provided from the “schoolchildren” or their families.5, 8

A highest statistically significant prevalence of bacterial, viral, fungal and parasitic infections, among pupils having father’s education of primary or secondary school, and the mother who had primary school education. The low education donates to the low socioeconomic status of the family and less orientation about the health status of their children. This in agreement with that of Amoran OE et al.9 While Khalifa KA found that the “infectious skin diseases” was significantly associated with the educational level of the father.5

The present study showed a higher significant prevalence of bacterial (7%), viral (8.7%), fungal (1.3%) and parasitic (1%) infection among school children who were living with families having low economic status. This result is in agreement with previous reports.4,12,13

In general, this high prevalence rate might be due to that the skin diseases being neglected or even mismanaged, there were deficient in medical equipment for laboratory diagnosis, the closer contact between classmates in crowded classrooms, and poverty that have led to the evolution of the communicable “skin diseases”.

The prevalence rate of “viral skin diseases” is (16.7%) which is higher than that detected by Khalifa, (4.1%); Al-Saeed (2.4%); Ogubiyi (0.0%) and Inanir (3.8%). This variation might be caused by differences in the sample size, socioeconomic standards, and lack of early therapy and isolation.2,4,5,14

The present research found that a higher significant prevalence rate of bacterial, viral and parasitic infection among pupils of primary school level than that from secondary school level, who were older age and more aware of their skin, and could seek medical advice alone when needed.

The recognized limitations including, the diagnosis depended on eye inspection of 2 dermatologists for clinical examination, which was done mainly on the exposed parts of the body for each pupil, and sometimes all the body. Socio-demographic variables information provided from the parents (without authors interview).

**Conclusion**

“Infectious skin diseases” are very common and constitute an economic and public health problem among “school children”. “Viral skin infections” are more prevalent. Routine inspection of pupils for skin disorders by their teachers could control these diseases especially at age 11-14 years old. The rural area, crowding houses, the parent’s educational level, primary school pupils and low economic status were significantly associated with the prevalence of “infectious skin diseases”.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** None

**Funding:** Self-funding

**References**


Comparative Study between Recurrent Tonsillitis and Tonsillar Hypertrophy Based: Histopathological Grading and Hematological Parameters in Children

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Abstract

The current study investigates the differences between recurrent tonsillitis patients (T patients) and tonsillar hypertrophy patients (H patients) according to histopathological grading and some hematological tests in the study groups. The samples were taken (removed tonsil, and blood) from 20 children with tonsillitis and 20 children with tonsillar hypertrophy, by which tonsils kept in formalin(10%) for histopathological study. Blood samples were obtained during the period from November 2019 to January 2020. The histopathological difference in tonsils tissue was observed between the two groups. The result showed significant differences in the lymph follicles, germinal center, fibrosis, necrosis, and infiltration of inflammatory cell. No significant difference (p > 0.05) of the Erythrocyte Sedimentation Rate (ESR) level in T patient group(13.2±8.3mm/hr), compared to H patient group (13.06±7.5mm/hr). The WBC count (White blood cell) showed a non-significant difference (p > 0.05) between the groups.

Keywords: Recurrent tonsillitis, Tonsillar hypertrophy, WBC count, ESR.

Introduction

Tonsils are considered as part of the lymphatic Waldeyern ring, which is responsible for the first line of defenses against microbes since they are located at the entry of the respiratory and the digestive tract(1). There are three types of tonsils (pharyngeal tonsil, lingual tonsil, and palatine tonsils), the palatine tonsils is frequently referred to as “tonsils” in the medical terminology and sometimes known as facial tonsils. They’re located in the lateral position of the oropharynx(2). The tonsils are physiological serves as a protection against respiratory antigens and play an important role in the adaptive immune response.(3).

Tonsillitis is the most common inflammation of palatine tonsils of microbial origin. It may be either chronic or acute, that is generally caused by either viruses or bacteria(4). Recurrent tonsillitis is defined as a person suffering from multiple tonsillitis attacks annually. Recurrent and chronic tonsillitis can involve frequent episodes of inflamed tonsils that have a significant effect on patient health(5).

Tonsillar hypertrophy sometimes is idiopathic tonsillar hyperplasia that leads to unusual palatal tonsillar enlargement. Pediatric tonsillar hypertrophy is not a consequence of recurrent inflammation, acute tonsillitis or middle ear infections(6). Tonsillectomy is the most performed treatment that completely removes the tonsil, including its capsule, by dissecting the peritonsillar space between the tonsil capsule and the muscular wall surgery(7). Our study aimed to identify the histopathological, and hematological changes accompanying these complications of diseases.

Materials and Method

The study groups are 20 with tonsillitis (T patient...
group) and 20 with tonsillar hypertrophy (H patient group). The tissue specimens were obtained during operations of tonsillectomy from Central teaching hospital of pediatric in Baghdad City the haematological study was conducted at the Educational Laboratories/Medical City and from November 2019 to January 2020. The specimens of tonsil tissue were obtained from children after operations of tonsillectomy. The tissue specimens were kept in the fixation solution (formalin 10%) for histopathological study according to the method of Suvaran\(^8\). Five ml of venous blood was collected from the patient and transferred the EDTA tube. Assayed was done by using CELL-DYN Ruby haematology analyzer for WBC count. Fresh blood was used to measure ESR, disposable ESR tubes and disposable ESR pipettes.

**Statistical Analysis:** The Statistical Analysis System (SAS), the obtained data were subjected to the X2 test and one way analysis of variance (ANOVA) test to compare various groups with each other. Results were expressed as mean ± standard deviation (SD) and values of p>0.05 were considered statically non-significant while p<0.05 and <0.01,0.001 were considered significantly different, highly significantly different respectively. The statistical analysis was carried out by SPSS (V. 24).

**Results and Discussion**

**Histopathological study of Tonsils:** The histological study using H & E stain in obtained tonsil tissue after tonsillectomy. In T patients group, lymph follicle-1 was seen in 11(55%) with less than 25 follicles and in lymph follicle-2 showed and 9(45%) with more than 25 follicles, the result showed a significant difference (p<0.05) between two lymph follicle groups. The result showed a significant difference (p<0.05) when compared between two lymph follicle groups of H patients group in which the lymph follicle-1 was seen in 6(30%) with less than 25 follicles and in lymph follicle-2 showed 14(70%) with more than 25 follicles. On the other hand, there was a significant difference (p < 0.05) between the T patients and H patients group of lymph follicle-1 and -2. Also, the result showed a significant difference (p < 0.05) between germinal centers-1 which seen in 9 (45 %) and germinal centers-2 which seen in 11 (55 %) in T patients group. Also, H patients group showed a significant difference (p < 0.05) between germinal centers-1 in 8(40 %) and germinal centers-2 that seen in 12(66%). Also, when compared the T patients group with H patients group there was a significant difference (p<0.05) observed in germinal centers-1, but there was a non-significant difference (p>0.05) observed in germinal centers-2 between T and H patients group (Table-1) and (Figure-1 A,B).

**Table 1: Distribution of patients by the categorical variables: lymph follicles and germinal centers in the cases Recurrent Tonsillitis and Tonsillar Hyperplasia**

<table>
<thead>
<tr>
<th>Category</th>
<th>Group</th>
<th>1</th>
<th></th>
<th>2</th>
<th></th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymph follicles</td>
<td>T</td>
<td>11</td>
<td>55</td>
<td>9</td>
<td>45</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>6</td>
<td>30</td>
<td>14</td>
<td>70</td>
<td>0.01</td>
</tr>
<tr>
<td>P. value</td>
<td></td>
<td>0.01</td>
<td></td>
<td>0.01</td>
<td></td>
<td>----</td>
</tr>
<tr>
<td>Germinal centers</td>
<td>T</td>
<td>9</td>
<td>45</td>
<td>11</td>
<td>55</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>8</td>
<td>40</td>
<td>12</td>
<td>60</td>
<td>0.01</td>
</tr>
<tr>
<td>P. value between the main groups</td>
<td></td>
<td>0.05</td>
<td></td>
<td>NS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

T: Recurrent tonsillitis, H: Tonsillar hyperplasia.
Number of lymph follicles 1: less than 25 follicles per field of x4, 2: 25 or more follicles per x4.
Number of germinal centers 1: less than 6 germinal centers per field of x10, 2: more than 6 germinal centers per field of x10.
NS: No significant, P value: P>0.05, each group total number = 20

The histopathology examination of tonsil tissue in our study agreement with Rajeshwary et al.\(^9\) and AL-Hussaini et al.\(^{10}\) indicated the presence of multiple lymphoid follicles, germinal centers, fibrosis and infiltration of inflammatory cells. The enlargement of germinal centers of the H patients group in comparison
with those from the T patients group indicates the lymphoid follicle is very active\textsuperscript{(11)}. The lymph follicle hyperplasia and enlargement are most findings in the removed tonsils of pediatric in the lymph nodes areas of active, mixed, and chronic inflammation that may be seen\textsuperscript{(12)}. The follicular area enlargement is the main histological characterization of hypertrophied tonsil as a result to a hyperplastic disorder of lymphoid cells that can be explained due to difference in etiology and immune response in this tonsil\textsuperscript{(13)}.

The other histopathological changes in (Table-2) and Figure-1 C,D,E) fibrosis, necrosis, neutrophil in epithelium crypt, and infiltration plasmocyte between T and H patient groups as three levels (0-absent, 1-mild, 2-moderate, and 3-severe).

The result showed that percentage of necrotic tissue was very little in general, only milled necrosis was seen in 2(10\%) of the T patients group, and 1(5\%) of the H patients group that showed a significant difference (p<0.001) between the two groups of patients.

The obtained data showed fibrosis in T patients group was demonstrated in high percentage as mild fibrosis in 12(60\%), 6(30\%) as moderate fibrosis and only 2(10\%) appeared with intense fibrosis, while in H patients group fibrosis appeared with 5(25\%) mild fibrosis, 6(30\%) moderate and 9(45\%) intense fibrosis which was the highest percentage. The result showed a highly significant difference (p < 0.01) between the T and H patients group of fibrosis.

In the T patient group, the neutrophil in epithelium crypt was absent in 4(20\%) and appeared in 10(50\%) as mild and in 6(30\%) as moderate. The result showed a significant difference (p<0.01) when compared with H patients group in which the neutrophil in epithelium crypt was absent in 7(35\%) and seen in 9(45\%) as mild and in 4(20\%) as moderate.

Based on the result the plasmocyte infiltration on the T patients group was observed in 11(55\%) as mild, 7(35\%) as moderate, and 2(10\%) as intense. While in the H patient group an excessive number of plasmocyte infiltration has been observed, a mild infiltration in 8(40\%) and moderate infiltration in 12(60\%) has been recorded. The result showed a significant difference (p<0.01) when compared between the T and H patient group.

### Table (2): Distribution of patients by the categorical variables: fibrosis, necrosis, neutrophil in epithelium crypt, and infiltration plasmocyte in the cases Recurrent Tonsillitis and Tonsillar Hyperplasia

<table>
<thead>
<tr>
<th>Category</th>
<th>Group</th>
<th>0 N</th>
<th>%</th>
<th>1 N</th>
<th>%</th>
<th>2 N</th>
<th>%</th>
<th>3 N</th>
<th>%</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Necrosis</td>
<td>T</td>
<td>18</td>
<td>90</td>
<td>2</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>19</td>
<td>95</td>
<td>1</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Fibrosis</td>
<td>T</td>
<td>-</td>
<td>-</td>
<td>12</td>
<td>60</td>
<td>6</td>
<td>30</td>
<td>2</td>
<td>10</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>25</td>
<td>6</td>
<td>30</td>
<td>9</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Neutrophil in epithelium crypt</td>
<td>T</td>
<td>4</td>
<td>20</td>
<td>10</td>
<td>50</td>
<td>6</td>
<td>30</td>
<td>-</td>
<td>-</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>7</td>
<td>35</td>
<td>9</td>
<td>45</td>
<td>4</td>
<td>20</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Infiltration plasmocyte</td>
<td>T</td>
<td>-</td>
<td>-</td>
<td>11</td>
<td>55</td>
<td>7</td>
<td>35</td>
<td>2</td>
<td>10</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>-</td>
<td>-</td>
<td>8</td>
<td>40</td>
<td>12</td>
<td>60</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

T: Recurrent tonsillitis, H: Tonsillar hyperplasia., 0-absent, 1-mild, 2-moderate, 3-intense, P value: P>0.05, each group total number n=20

The result disagrees with Reis et al.\textsuperscript{(14)} who considered the germinal center is the only difference between the two groups. The results showed neutrophils and plasmocyte cells infiltration that may be related to long time chronic infection or frequent attacks that led to the moving of more inflammatory cells to the tissue. In chronic infection, the circulation of blood is poor as a result of degenerative changes causing fibrosis like in chronic tonsillitis\textsuperscript{(12)}.

The result agree with Onal et al.\textsuperscript{(15)} and Wittlinger et al.\textsuperscript{(16)}, the small size tonsils with tonsillitis infection
had low lymphoid tissue and high fibrotic tissue large hypertrophied tonsils have high lymphoid and low fibrotic tissue. There was an increase in the neutrophil count is often seen. Blood circulating neutrophils have short life-span then die after entering the inflamed tissues\(^{17}\).

**Figure 1:** Cross section in palate tonsil detected by demonstrating, A: increased in size of lymphoid follicles, B: Germinal centers, C: Fibrosis, D: Neutrophil in epithelium crypt, E: Infiltration plasmocyte (H & E, X4).

**Erythrocyte Sedimentation Rate (ESR):** Data in (Table 3) showed the (mean±SE) of ESR in the control group was (8.9±4.3mm/hr) which showed a non-significant difference \(p>0.05\) when compared with patient groups. As well as when compared between the T patients group \((13.2±8.3\text{mm/hr})\) and H patients group \((13.06±7.5\text{mm/hr})\), the result showed a non-significant difference \(p>0.05\).

This result is agreement with the previous study Mohamed et al.\(^{18}\) and Mackway\(^{19}\) who have also found there was no elevated in ESR of patient undergo tonsillectomy and Abdelkafy et al.\(^{20}\) result where the most patient shows normal ESR. The ESR is a traditional inflammatory indicator, due to its low sensitivity and specificity and the use of newer inflammatory indicators the importance in clinical research have been reduced\(^{21}\).

**Table (3):** The ESR difference in the cases Recurrent Tonsillitis and Tonsillar Hyperplasia.

<table>
<thead>
<tr>
<th>Tested groups</th>
<th>ESR (mm/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recurrent Tonsillitis (T)</td>
<td>13.2±8.3</td>
</tr>
<tr>
<td>Tonsillar hypertrophy (H)</td>
<td>13.06±7.5</td>
</tr>
<tr>
<td>P value between test groups</td>
<td>NS</td>
</tr>
<tr>
<td>Control</td>
<td>8.9±4.3</td>
</tr>
<tr>
<td>P value between test groups and control</td>
<td>NS</td>
</tr>
</tbody>
</table>

Results are expressed as mean ± Standard Error, NS: No significant, \(P\) value: \(P > 0.05\), each group total number = 20, ESR: Erythrocyte Sedimentation Rate.

**Blood Cell Count:** Based on the result showed in (Table 4) only the total WBCs count, neutrophil and lymphocyte showed a significant difference.
(p<0.05) between the control group that was (2.9±1.1, 3.5±6.2, 6.4±1.2 cell/μl respectively) when compared with T patients group ((8.7±2.9, 4.7±3, 3.4±1.4 cell/μl respectively) and the H patient group (8.0±2.5, 4.2±3.2, 3.2±1.5 cell/μl respectively).

Table 4: Effect of study groups in different blood cells of patients and control.

<table>
<thead>
<tr>
<th>Tested groups/(Cell/μl)</th>
<th>WBCs</th>
<th>Neutrophil</th>
<th>Lymphocyte</th>
<th>Monocyte</th>
<th>Eosinophil</th>
<th>Basophil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recurrent Tonsillitis (T)</td>
<td>8.7±2.9</td>
<td>4.7±3</td>
<td>3.4±1.4</td>
<td>0.5±0.2</td>
<td>0.4±0.3</td>
<td>0.1±0.1</td>
</tr>
<tr>
<td>Tonsillar hypertrophy (H)</td>
<td>8.0±2.5</td>
<td>4.2±2.5</td>
<td>3.2±1.5</td>
<td>0.5±0.2</td>
<td>0.3±0.2</td>
<td>0.1±0.2</td>
</tr>
<tr>
<td>P value between test groups</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>Control</td>
<td>6.4±1.2</td>
<td>3.5±6.2</td>
<td>2.9±1.1</td>
<td>0.4±0.2</td>
<td>0.4±0.1</td>
<td>0.1±0.1</td>
</tr>
<tr>
<td>P value between control and test groups</td>
<td>0.01</td>
<td>0.05</td>
<td>0.05</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
</tbody>
</table>

Results are expressed as mean ±Standard Error, WBCs: White Blood Cells, NS: No significant, P value: P > 0.05, each group total number = 20

The WBC count is the main blood indicators of general inflammation\(^{(22)}\). In current study, the significant increase in the count of WBC between patients and control group, even if it exists but remain within normal limits. As a result of the immune defense against microbial invasion, the total and differential levels of WBCs in blood will change\(^{(23)}\). Our result agrees with the study of Christensen et al.\(^{(17)}\), Kara et al.\(^{(24)}\) and Yorulmaz et al.\(^{(25)}\), which showed there is an increase in the total WBC count for the patient group who undergo a tonsillectomy while disagree with study of Cengiz et al.\(^{(26)}\) showed a non-significant difference in WBC count patient with the control group.

Conclusion

There is a histopathological difference between recurrent tonsillitis and tonsillar hypertrophy in germinal center, lymph follicle, fibrosis, necrosis and infiltration of inflammatory cell. In addition, significant increase in patient group when compared with control in WBC count, and no difference between T patients group and H patients group, and no significant difference in ESR level between all groups.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: None

Funding: Self-funding

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with recurrent tonsillitis and idiopathic tonsillar hypertrophy. Biomedical Papers of the Medical Faculty of Palacky University in Olomouc. 2019;163(4):349-354.


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Abstract

COVID-19, a new, rapidly spreading coronavirus strain, has reached more than 150 countries and is gaining worldwide attention. The shortage of successful SARS-CoV-2 medicines or vaccines has exacerbated the situation even further. Therefore, research is urgently required to establish effective therapeutics and affordable diagnosis for COVID-19. It is the responsibility of the scientific research community in this time of health crisis to provide an alternative, reliable, and accessible method for vaccinating human bodies against COVID-19 viral infections, based on focused experimental approaches. Coronavirus (CoV) is an RNA virus for the forward, forming stick-shaped spikes on its surface. This is an undesirable, small RNA genome, with an infinite mode of replication. The corona virus causes numerous diseases in mammals, birds, pigs, and chickens. It causes upper respiratory tract infections, which can lead to death from respiratory diseases. Within this article the author briefly explains this abrupt occurrence Extreme lung disease, extremely pathogenic and newly discovered respiratory syndrome (MERS-CoV) in corona virus of the Middle East. It is a research paper on the detection of CoVID-19 infections and their dissemination across the world.

Keywords: Covid-19, Structure of coronavirus and Life cycle.

Introduction

Hospitals declared on 31 December 2019 in Wuhan, Hubei, China, a cluster of cases of unknown cause of pneumonia attracting great national and worldwide attention(1). Coronavirus (CoV) is a big group of positive Nidoviral RNA single-stranded viruses. There is also a list of the Arteriviridae, Coronaviridae, and Roniviridae. The Coronaviridae family is classified in the Coronavirinae and Torovirinae subfamilies. Coronavirinae even below the alpha, beta, gamma, and delta COV level(2). Such forms of viruses have been named for the phylogenetic clustering. The viral RNA genome varies in length from 26 to 32 kilobases. They can be separated from various species of animals. These involve birds, goats, and mammals including camels, bats, and masks Civets of leaves, mice, pigs, cats...

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World Health Organization (WHO) named the disease on 11 February 2020 as the coronavirus disease-2019 (COVID-19), caused by this novel virus. The repeated appearance and CoV outbreaks suggest a threat to public health. This demonstrates the possibility of moving newly evolving CoVs from animal to human, and human to human. The ongoing ecological and climatic changes make these infections more likely to occur in the future.(4)

History of Coronavirus: (1960), it reported the very first corona virus outbreak with cold symptoms. According to the Canadian study of 2001, approximately 500 patients were registered as pneumonia-like conditions. In 2003, numerous studies have been published with proof of the expansion of the corona to various states such as Hong Kong, the United States, Thailand, Singapore, and China. In 2003, several cases of a severe acute respiratory syndrome caused by the corona were reported, and in March to June 2003, their death rate was around 1000 patients. In 2012 Saudi Arabian reported multiple infectious victims and deaths(5). COVID-19 was first observed and reported from the pneumonia monopoly belonging to China, Wuhan. Much of the sudden outbreak occurred..In Hong Kong, China, Singapore and other countries in North America and Southeast Asia. In December 2019, this epidemic broke out again in the city of Wuhan (China). NCoV-19 was approximately distributed worldwide to more than a hundred counties. Of all nations, 80,824 cases (54.02%) confirmed by nCoVD-19 are reported and their incidence continually increased(6).

Epidemiology of Covid-19: The coronaviruses are the single-stranded RNA viruses common to humans, other animals, and birds that cause enteric, liver, breathing, and neurologic problems. Six coronavirus species are known to cause human disease. Four viruses such as hCoV-229E, OC43, NL63, and HKU1 are prevailing and typically cause mild illnesses(7). The two new lethal diseases (coronaviruses), the 2002 severe acute respiratory coronavirus syndrome (SARS-CoV), and the 2012 Middle East Respiratory Coronavirus Syndrome (MERS-CoV), are widespread at different locations. The occurrence of new coronaviruses and the broad spread of coronavirus, genetic variation, regular genome recombination, and human and animal behavior are also correlated with the development of new coronaviruses in humans. As(8) the 2019-nCoV genome produced is therefore phylogenetically closest to other SARS-CoV identified beta-coronavirus, which according to other studies suggests are 75-80% identical to the SARS-CoV and 40% equivalent to MERS-CoV. This could be propagated by increasing SARS-CoV and MERS-CoV in the coronaviridae family. Indeed, in primary airway cells of the 2019-nCoV epithelial cell, as opposed to SARS-CoV or MERS-CoV, grow better than standard tissue-culture cells. It seems that 2019-nCoV has the same hACE2 (human angiotensin-converting enzyme 2) cellular receptor as SARS-CoV(8).

Structure genome coronavirus: The genomic structure of the coronavirus is a member of the Nidoviral, the Coronaviridae, and Coronavirinae subfamily. This subfamily is also known as coronaviruses on the basis of the phylogenetic cluster of alpha, beta, gamma, and delta. These viruses are found in RNA enveloped by 26-32 kilobases. The genome has a 5′ cap and a 3′ poly(A) tail to help serve as mRNA in the translation of polyprotein replicas(2). In addition to an untranslated region and a leading sequence, the 5′ coronavirus end comprises several loop structures that contribute to transcription and replication of the RNA. There are also transcriptional regulatory sequences at the beginning of each structural gene which supports their expression. Even the 3′UTR segment includes RNA structures that help replicate and synthesize viruses. Coronavirus accessory proteins are not needed for replication; however, it was demonstrated that some of the protein in viral pathogenesis played significant roles(9). Coronavirus virions, as confirmed by cryo-electrons microscopic and tomographical techniques, have spherical form and a diameter of about 125 nm. The form of the club is like projections on the floor. The nucleocapsid inside the virus is symmetrically symmetric, which is characterizing the negative nature of RNA virus disease(2). Virions are four main structures, namely the pike, membrane, shell, and nucleocapsid, in the 3′ end of the viral genome. The β-coronavirus group also contained a fifth structural protein, hemagglutinin esterase. It binds sialic acids to a glycoprotein’s surface and is involved in acetylesterase. These activities improve protein-mediated cell entry and distribution in S.
Coronavirus Life Cycle: The four stages of a coronavirus life cycle are: (1) entry and attachment (2) protein expression replicase (3) replication and transcription (4) assembly and release. The association of the S-proteins with their receptors marks the virion’s initial attachment to the host cell. The S-Protein and the receiver mixture is the primary determinant of a coronavirus that also affects the hosts and controls the virus’ tissue tropism. In most coronaviruses, peptidase serves as the cell receptor. The receptor reaches the cytosol in the host cell once the virus has been released.

This action is facilitated by the acid-dependent S-protein proteolytic cleavage called cathepsin or other associated proteases accompanied by cellular and viral membrane fusion. Two cleavages are formed in the S2 portion of the protein; one is necessary in order to distinguish the receptor binding and the S-protein fusion domain and another is needed for exposure to peptides. Most of the fusion however occurs in acidified endosomes, some coronaviruses fusing on the plasma membrane region. Virion entry and attachment is accompanied by the expression of replicase protein, in which the replicase gene is converted into the virion genomic RNA. The replicase gene encodes two ORFS; rep1a and rep1b, which in turn are expressed in two co-terminal polyproteins, pp1a and pp1ab. The virus uses a slippery sequence to express all the polyproteins (5’-UUUAAAC-3’) and a pseudoknot of RNA that triggers ribosomal frameshifting from the rep1a read frame to the rep1b ORF. The pp1a and pp1ab polyproteins comprise the 1–11 and 1–16 nsps, respectively. In pp1ab, after extension of pp1a into pp1b, nsp11 from pp1a becomes nsp12. The nsps are assembled in the replicate-transcriptase complex (RTC), the setting in which the synthesis of RNAs is conceived and the replication and transcription of subgenomic RNAs are primarily responsible for these. Create and translate the genome and subgenomic RNAs after virus RNA-synthesis. Subgenomic RNAs reflect the accessory and structural genes as mRNAs occurring downstream of replicas of polyproteins. Both genomic, as well as subgenomic RNAs, are produced by negative-strand intermediates. Finally, coronaviruses also have remarkable capacity to recombine with homologous and non-homologous recombinations. After replication and subgenomic synthesis of the RNA, S, E, and M viral structure proteins are encoded and incorporated into the endoplasmic reticulum (ER). Such proteins can pass through the secretory pathway into the endoplasmic reticulum-Golgi intermediate compartment (ERGIC). The N-protein bud encapsulates viral genomes into ERGIC membranes containing the viral structural proteins that form mature virions. These virions are transported to the cell surface and released via the process of exocytosis.
Conclusions

The pandemic in COVID-19 is a significant challenge to healthcare systems worldwide. The international community was alerted to future worst-case situations by the number of injuries and deaths. We have no clear information ex Strategy to treat COVID-19 patients despite our bits of knowledge of the SARS-CoV-2 infectious cycles. Different potential drugs with SARS-CoV-2 anti-viral activity are studied on the basis of recent research results and guidance. Ideally, an appropriate vaccine and best practices will be established to diagnose and treat symptomatic cases.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: None

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Reference


Ultrastructure Study of Hydatid Cyst Isolated from Sheep Exposure to Tendazol and Bendaziole

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Abstract

Cystic Echinococcosis is the most important zoonotic parasite with community health in addition to financial problem. This study was planned to detect a morphological structure of protoscolices of hydatid cysts that isolated from slaughtered sheep that exposure to Tinidazole and Bendaziole, and showed a different number and shape of hydatid cysts from different organs like; lungs and livers, with viability result of protoscolices. A clear be to found a hydatid sand and protoscolices distribution, and germinal layer without any treatment, all normal in shape and structure, but samples treated with drug Tinidazole and Bendaziole. It is a clear found distraction of protoscolices, and germinal layer of hydatid cyst in shape and structure. The current study explain some different between the liquid and germinal layer of cyst when sample treated with these drugs and other not treated in shape and morphological form of protoscolices.

Keywords: Echinococcus granulosus, Hydatid cyst, SEM, Tinidazole and Bendaziole.

Introduction

Hydatid cyst consider from one the most zoonotic parasite in the word with community health[1]. Pathogenicity of this parasite count on the location of the parasite in the organs and severity of infection, when occur burst of hydatid cysts some time leads to death due to bleeding and metastasis[2]. In the beginning Echinococcosis develops as a liquid bladder via cyst wall, and protoscolices from germinal layer near cyst cavity[3], Cyst development of and protoscolices taken place in fertile[4].

Scanning electron microscopy is a type of electronic microscope used in the biomedical sciences, study the morphology and distinguish the surfaces of organs and tissues[5-6]. There are little studies using SEM to diagnosis and morphological details such as hooks and protoscolices[7]. Also There are some researches that described morphological shape of worm by using SEM[8]. In addition to study using SEM of hydatid cyst include the morphology of the protoscolices isolated from sheep in Libya[9].

In Egypt a study of hydatid cyst- isolated from tissue lesions in liver and lung of camels and sheep show structures of the protoscolices by scanning electron microscope were done by SEM[10].

The aim of this study was to detect a morphological structure of protoscolices of hydatid cysts that isolated from slaughtered sheep and exposure to Tinidazole and Bendaziole.

This study was planned to detect a morphological structure of protoscolices of hydatid cysts that isolated from slaughtered sheep that exposure to Tinidazole and Bendaziole, and showed a different number and shape of hydatid cysts from different organs like; lungs and livers, with viability result of protoscolices. A clear be to found a hydatid sand and protoscolices distribution, and germinal layer without any treatment, all normal in shape and structure, but samples treated with drug

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Tinidazole and Bendazule. It is a clear found distraction of protoscolices, and germinal layer of hydatid cyst in shape and structure. The current study explain some different between the liquid and germinal layer of cyst when sample treated with these drugs and other not treated in shape and morphological form of protoscolices.

**Materials and Method**

Hydatid cysts collection: The hydatid cyst from animal samples (sheep) were collected from slaughter house and butcher after remove the cyst from infected organ.

Scanning Electron Microscope: The isolated cyst was washed three times with normal saline (0.9%) and then separated by using centrifuge then preserve the protoscolices by ethyl alcohol (70%).

Other sample treated with Tinidazole and Bendazule according to[11], after that the samples were sent to Tehran University for scanning electron microscope which was done according to[12].

**Viability of Protoscolices:** The sediment of protoscolices were transferred to clean slid and then put one drop from eosin satin, moving circularly then examined under microscope according to the method[13].

**Result**

The current study showed a different number and shape of hydatid cysts that isolated from sheep from different organs like; lungs and livers (Fig. 1), and the viability result of protoscolices can be found in (Fig. 2).

In (Fig. 3) it clear be to found a hydatid sand and protoscolices distribution, and germinal layer without any treatment, all normal in shape and structure.

![Fig. 1: Hydatid cyst isolated from sheep (A) lung (B) liver](image1)

![Fig. 2: Viability of protoscolices isolated from sheep; live (green) and dead (red) with eosin stain (A) (40x) and (B) (10x).](image2)
Fig. 3: Ultra structure with SEM of (A) hydatid sand with protoscolices (200 X), (B) germinal layer with clear branches (500; 50 X) isolated from sheep without any treatment.

In (Fig. 4) it could be found a clear distraction of protoscolices in hydatid sand and germinal layer of hydatid cyst that treated with Tinidazole drug, while in (Fig. 5) a hydatid cyst treated with Bendaziole drug and a clear change in protoscolices and germinal layer with shape and structure.

Fig. 4: Ultrastructur with SEM of (A) hydatid sand with protoscolices (200 X), (B) germinal layer (500; 250 X) isolated from sheep treated with Tinidazol drug.

Fig. 5: Ultrastructur with SEM of (A) hydatid sand with protoscolices (200 X), (B) germinal layer (500; 250 X) isolated from sheep treated with Bendaziole drug.
Discussion

The current study including ultrastructure study of hydatid cyst by Scanning electron microscope isolated from sheep as normal without any treated and some samples treated with drug Tinidazole and Bendaziole. It is a clear found distraction of protoscolices, and germinal layer of hydatid cyst that treated with Tinidazole drug and Bendaziole in shape and structure.

This study showed a different shape and size of cyst in liquid and germinal layer of each treatment that agreement with Elmajdoub et al (2014) SEM use to examine the size, shape and hooks from different host.

In Egypt study histopathological and the structures of the Protoscolesescamel by (SEM) showed invaginated of protoscolex and the capsule of cyst. The present study also show the effect of two drug Tinidazole and Bendaziole that used these drug in vitro in sheep effect in dead of protoscolices when add to liquid of hydatid cyst after 24h when used eosin stain and also Bendaziole drug of sheep was consider the second degree after Tinidazole to dead of protoscolices of sheep and show this changes in scanning microscope in liquid and germinal layer.

Also another study may be give some similarity with current study that used Flubendazole drug in vivo in mice caused morphological changes in hydatid cyst treated with drug and also showed a similar ultra structural changes in cysts recovered from the same drug the ultra-structural different see in the membrane of cysts recovered from Flubendazole treat animals. Another study about effect the drug on hydatid cyst by scanning microscope by Morris et al (1986) showed that Praziquantel fastresult on the viability of protoscolices. SEM show breakin the tegument of cyst when treated parasite.

The great variability see in the therapeutic hit of a benzimidazole anti helminthespossibly willexplain by the host immunological condition or the facial appearance of the cysts, as well as their size and location.

A number of studies also show using SEM such as other researcher. They show fine details of immature invaginated and mature evaginated of protoscolices.

The current study explain some different between the liquid and germinal layer of cyst when sample treated with these drugs and other not treated in shape and morphological form of protoscolices.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: None

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Association between ki67 and PR Expression in Grades of Meningioma and its Prognosis

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Abstract

Introduction: Meningioma is the very important type of tumor that occur in central nervous system (CNS) that represented 1/3 of whole tumor of CNS. In USA 97/100,000, persons recorded have meningioma. With 170,000 patients detected as meningioma. The aim of study is the aim of the present study is to evaluate the use of immunhistochemical expression of PR and ki67 for predicting the grades of meningioma, which are important in their prognosis, and line of treatment.

Method: Ninety patients with meningioma were collected from the Neurosurgical Hospital-Baghdad, during the period from January 2017 to January 2020. The data for cases were collected to study the age, gender and grade of tumor. Staining hematoxylin/Eosin (H plus E) for histological inputting and classifying of the tumors and immunohistochemically workup for PR & Ki67 done.

Results: Cross sectional study for 90 patients with age, mean (44 ± 12) years old, in current study 64% of patients was females and 36% of patients was males, strong positive PR expression represented 50% of patients, 79% of patients have low Ki 67, 15% of them have intermediate Ki67 and 6% of patients with high Ki67. Most of patients with age group 40-59 years old (51%). The mean and SD of Ki67 in (%) according to grades of meningioma I, II and III as following: (0.3 ± 0.07), (7 ± 5.9) and (38 ± 0.07) respectively. There is significant association between grades of meningioma and PR expression; 71% of grade I with PR expression strongly positive, 23% of grade II with PR expression were weakly positive and 100% of grade III with PR expression were negative. In addition, there is significant association between grades of meningioma and prognosis; 100% of grade I with good prognosis, 100% of grade II with fair prognosis and 100% of grade III with poor prognosis. In current study, also there is significant association between grades of meningioma and Ki67; 100% of grade I with low level of Ki67, 100% of grade III with high level of Ki67 and 64% of grade II with intermediate level of Ki67. There is no significant association between age and gender with grades of meningioma.

Conclusion: The mean Ki-67 was significantly more in meningioma grade III than in patients with grades II and I as WHO classification. There is strong expression of PR was found mainly in the grade I typical meningioma group. Utilization of markers for proliferation (ki-67 labeling index) and hormonal expression (Progesterone Receptor) in combination with histopathological features may help in the identification of biologically aggressive meningioma.

Keywords: ki67 & PR expression, grades of meningioma, prognosis.
detected as meningioma. Female to male ratio show females more than males 2:1 for meningioma intracranial and 10:1 for meningioma of spine all pervious tumor detected at middle age group. Two important factors that affected on the prognosis of patients with meningioma: the ratio of resection of tumor and histopathological degree of tumor. Recurrence can occur when tumor with high-score not reach complete resection. Recurrence interpreter according to WHO guide, in which recurrence of meningioma that characterize as kind, unusual and anaplastic for 20 years is 7-25%, 29-52% and 50-94%, correspondingly. Subsequently there are boundaries to repetitive histopathological checkup in expecting tumor progressivity, numerous scrutiny procedures established including cytogentic and use of immunohistochemically checkups. However, those checkups have not been accepted as usually on patients with meningioma. Approximately important immunohistochemically tests on meningioma include EMA, vimentin and cytokeratin. Ki-67 checkup, which is a proliferative interpreter, displays the outcomes as a prognostic meningioma. Therefore, the aim of study is the aim of the present study is to evaluate the use of immunohistochemical expression of PR and ki67 for predicting the grades of meningioma, which are important in their prognosis, and line of treatment.

**Method**

**Materials:** Ninety patients with meningioma were collected from the Neurosurgical Hospital-Baghdad, during the period from January 2017 to January 2020. The data for cases were collected to study the age, gender and grade of tumor. Staining hematoxylin/Eosin (H plus E) for histological inputting and classifying of the tumors and immunohistochemically workup for PR & Ki67 done.

**Specimens:** According to WHO classification the 90 cases classified into typical meningioma, atypical meningioma and malignant meningioma. From each formalin fixed paraffin embedded tissue, three sections of 5 micron thickness were obtained and stained by haematoxylin & eosin staining method and immunohistochemically by using monoclonal antibody for PR & ki-67.

**Method of staining procedures:**

**a. Deparaffinization:** This has been performed by immersion in the following:

1. Xylene for 5 minutes.
2. Xylene for 5 minutes.
3. 99% ethanol for 5 minutes.
4. 99% ethanol for 5 minutes.
5. 99% ethanol for 5 minutes.
6. 95% ethanol for 5 minutes.
7. 70% ethanol for 5 minutes.
8. Distilled water.

**b. Hematoxyline and eosin staining method:**

1. Dewax sections (deparaffinization as above).
2. Stain in hematoxyline for 3-10 minutes.
3. Wash well in running tap water.
4. Remove excess stain by differentiating the sections in 1% acid alcohol (1% in HCL 70% alcohol) for 5-10 seconds.
5. Wash well with in tap water until sections regain their blue color.
6. Stain in eosin for 2-5 minutes.
7. Dehydrate slowly through increasing grades of alcohol (i.e. 70%, 90% and 100%).
8. Clearing by xylene.
9. Mount wit DPX.

**c. Immunohistochemical staining method:** One tissue block with representative tumor was selected in each case for immunohistochemical staining. By using the Envision™ Flex, staining was performed by manual method as following:-

1. Five microns section was obtained from the formalin fixed paraffin embedded tissue block and mounted on positively charged slide. The sections were dried for 1 hour at 60°C.
2. Deparafinization was done by incubating the section in an oven at 65°C for 20 minutes followed by two changes of xylene for each.
3. Target retrieval solution, PH 9 (Dako cytomation).
4. Incubate in water bath at 95°C for 20-30 minutes.
5. After cooling, wash in Envision™ Flex wash buffer for 5 minutes.
6. Encircle tissue with Pap Pen. Wipe off buffer ½ cm above and below the tissue and draw a line with the Pap Pen.
7. Incubate with Envision™Flex Peroxide Blocking Reagent for 5 minutes.
8. Wash in Envision™Flex wash buffer.
9. Incubate with primary antibody for 20 minutes.
10. Wash in Envision™Flex wash buffer.
11. Envision™Flex/HRP secondary antibody (ready to use) for 20 minutes.
12. Wash in Envision™Flex wash buffer, incubate for 5 minutes.
13. Incubate with Envision™ Flex-DAB+ chromogen (for 10 minutes).
14. Wash in Envision™ Flex wash buffer.
15. Envision™ Flex hematoxylin (ready to use) incubates for 5 minutes.
16. Wash slides in deionized water.
17. Wash in Envision™ Flex wash buffer.
18. Wash slides in deionized water.
19. Dehydrate and mount the slides.

A. Ki-67 Scoring System: Immunohistochemistry for Ki-67 was carried out following the streptavidin–bioti n–peroxidase method (Monoclonal Mouse, Anti-Human Ki-67 Antigen/FITC, Clone MIB-1, Manufactured by Dako, Denmark). The mouse monoclonal Ki-67 antibody was used at a dilution of 1:25. Breast cancer tissue was used as positive control, and negative controls were performed by omitting the primary antibody. The Ki-67 staining index was recorded as the percentage of positive-staining tumor cell nuclei in 1000 tumor cell nuclei evaluated. The determinations were based on high magnification areas with the most immunostaining.

B. Progesteron Receptor (PR): Immunohistochemistry for PR was carried out by using polyclonal rabbit antiprogesterone was used at dilution 1:100 as the primary antibody, goat anti-rabbit IgG, and rabbit peroxidase antiperoxidase complex. Breast cancer tissue was used as positive control, and negative controls were performed by omitting the primary antibody. PR expression recorded into group I to III as follows: Group I – high staining of nucleus, group II - Weak staining if nucleus and group III - Lackingstaining of nucleus.

Statistical analysis done by SPSS 22 calculated mean and SD for age Ki67 and percentage, frequency for categorical variables. Chi square use for revealed association between categorical variables, significant association when P-value less than 0.05.

Results

Cross sectional study for 90 patients with age, mean (44 ± 12) years old, in current study 64% of patients was females and 36% of patients was males, strong positive PR expression represented 50% of patients, 79% of patients have low Ki 67, 15% of them have intermediate Ki67 and 6% of patients with high Ki67. Most of patients with age group 40-59 years old (51%). The mean and SD of Ki67 in (%) according to grades of meningioma I, II and III as following: (0.3 ± 0.07), (7 ± 5.9) and (38 ± 0.07) respectively. As show in table 1 and 2.

Table 1: Distribution of variables.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>58</td>
<td>64.4</td>
</tr>
<tr>
<td>Male</td>
<td>32</td>
<td>35.6</td>
</tr>
<tr>
<td>PR expression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>39</td>
<td>43.3</td>
</tr>
<tr>
<td>Strong positive</td>
<td>45</td>
<td>50.0</td>
</tr>
<tr>
<td>Weak positive</td>
<td>6</td>
<td>6.7</td>
</tr>
<tr>
<td>Ki 67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>71</td>
<td>78.9</td>
</tr>
<tr>
<td>Intermediate</td>
<td>14</td>
<td>15.6</td>
</tr>
<tr>
<td>High</td>
<td>5</td>
<td>5.6</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-39 years</td>
<td>34</td>
<td>37.8</td>
</tr>
<tr>
<td>40- 59 years</td>
<td>46</td>
<td>51.1</td>
</tr>
<tr>
<td>More than 60</td>
<td>10</td>
<td>11.1</td>
</tr>
</tbody>
</table>

Table 2: Mean and Std of Ki67 (%) according to grades of meningioma.

<table>
<thead>
<tr>
<th>Grades of meningioma</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Maximum</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>0.3</td>
<td>0.07</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>II</td>
<td>7</td>
<td>5.9</td>
<td>19</td>
<td>0</td>
</tr>
<tr>
<td>III</td>
<td>38</td>
<td>0.07</td>
<td>45</td>
<td>28</td>
</tr>
</tbody>
</table>

As in figure 1 and 2, the prognosis of meningioma is 70% of patients with good prognosis and 24.4% with fair prognosis. While the distribution of patients according to grade of meningiomas 70% of them in grade I, 24.5% in grade II and 5.5% in grade III.
Fig 1: Distribution of prognosis of meningioma.

Fig 2: Distribution of grades of meningioma.
In table 3: there is significant association between grades of meningioma and PR expression; 71% of grade I with PR expression strongly positive, 23% of grade II with PR expression were weakly positive and 100% of grade III with PR expression were negative. In addition, there is significant association between grades of meningioma and prognosis; 100% of grade I with good prognosis, 100% of grade II with fair prognosis and 100% of grade III with poor prognosis. In current study, also there is significant association between grades of meningioma and Ki67; 100% of grade I with low level of Ki67, 100% of grade III with high level of Ki67 and 64% of grade II with intermediate level of Ki67. There is no significant association between age and gender with grades of meningioma.

Table 3: Association between variables and grades of meningioma.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Grades of meningioma</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
<td>II</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>42</td>
<td>14</td>
</tr>
<tr>
<td>Male</td>
<td>21</td>
<td>8</td>
</tr>
<tr>
<td>PR expression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Strong positive</td>
<td>45</td>
<td>0</td>
</tr>
<tr>
<td>Weak positive</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Prognosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>Good</td>
<td>63</td>
<td>0</td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ki67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>63</td>
<td>8</td>
</tr>
<tr>
<td>Intermediate</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>High</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-39 years</td>
<td>27</td>
<td>6</td>
</tr>
<tr>
<td>40- 59 years</td>
<td>30</td>
<td>13</td>
</tr>
<tr>
<td>60≤</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>

P-value less than 0.05 (significant).
Discussion

Meningioma explanation more than 30% of major intracranial tumors according to WHO histologically classification of nervous system tumors. Most grade I meningioma classify as benign tumor while grade II and grade III are associated with a advanced risk of reappearance and littler survival periods. Human meningiomas unveil a heterogeneous histopathology, which may explain the repeated revisions of classification schemes. This study presents a review of 90 primary meningioma classified according to WHO classification of 2007. In current study, 64% of patients was females and 36% of patients was males this is similar to other results in other study that stated the incidence of meningioma in women was higher with a ratio of 2.1:1 compared to men. This comparison was reversed in prepubertal-age meningioma. In atypical and anaplastic meningioma cases, it was more dominant in men. The cause of the distribution is still unclear. Several studies have shown a positive relationship between the use of hormonal therapy used in women with the development of meningioma. Age has no effects on grades of meningioma, but most cases in all three grades of meningioma occur between (40-59) years at distribution 47.6%, 59.1% and 60.00% in grade I,II, and III respectively. In current study the incidence of grade I is 70% which is usually associated with good prognosis, grade II is 24.5 and grade III is 5.5% which is poor prognosis while grade II is in between regarding incidence and prognosis, this is similar to other study that stated the incidence of grade I is higher than grade II and grade II is higher than grade III. Several studies have been done to evaluate the title role of Ki-67 and PR in meningioma and to assess their character as prognostic features in assessing the performance of meningioma but many studies have given different suggestions concerning the association of Ki-67 and PR in meningioma and to assess their character as prognostic features in assessing the performance of meningioma. In current study the expression of progesterone receptor is strong in 45(71.4%) in grade I, negative PR expression in all cases of grade III, with weak expression in grade II, so PR expression strongly associated with grade of meningioma as grade of meningioma increase PR expression will be decrease. Ki-67 is a best indicator of cell proliferation eminence of the meningiomas. Ki-67 examines are progressively general because of their slight tissue necessities and appropriateness for regularly stable tissues. In the current effort, the mean Ki-67 classification index was significantly advanced in meningiomas of WHO grade III than in patients with grades I and II, like to the literature. Several studies in the past have demonstrated a proportionate increase in proliferative index and decrease progesterone receptor expression with increasing tumor grade. The assessment of proliferative activity and PR expression are a good indicator of tumor aggressiveness.

Conclusion

The mean Ki-67 was significantly more in meningioma grade III than in patients with grades II and I as WHO classification. There is strong expression of PR was found mainly in the grade I typical meningioma group. Utilization of markers for proliferation (ki-67 labeling index) and hormonal expression (Progesterone Receptor) in combination with histopathological features may help in the identification of biologically aggressive meningioma.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: None

Funding: Self-funding

References:


Distinguishing Exudative from Transudative Effusion by Using Pleural Fluid Cholesterol and Bilirubin in Comparative Study to Light’s Criteria

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¹Dr. Specialism, Health Department-employment in Ministry of Health/Iraq, ²Lecturer, ³Prof., Internatal Medicine Department/College of Medicine, Al-Nahrain University/Iraq

Abstract

Background: Pleural effusions are often classified into exudates and transudates based on certain biochemical parameters which include protein; lactate dehydrogenase (Light’s criteria); cholesterol and bilirubin, so the aim of the study is to evaluate the importance of pleural fluid cholesterol and bilirubin in differentiating exudative from transudate pleural effusion.

Method: Fifty patients with pleural effusion were evaluated for pleural fluid protein, lactate dehydrogenase (LDH), cholesterol and bilirubin and compared simultaneously with drawn blood sample for protein, LDH and bilirubin.

Results: In this study cholesterol in pleural fluid has a 94%, 100% sensitivity and specificity respectively and bilirubin ratio (pleural fluid bilirubin/serum bilirubin) has a sensitivity of 88% and specificity of 85% while the parameters of Light’s criteria i.e. protein ratio (fluid protein/serum protein) has 88%, 85% sensitivity and specificity respectively and LDH ratio (fluid LDH/serum LDH) has a sensitivity of 100% and specificity of 71%.

Conclusion: Pleural fluid cholesterol and bilirubin ratio have a better sensitivity and specificity in differentiating exudative from transudative pleural effusion than the parameters of Light’s measures.

Keywords: Pleural fluid cholesterol, bilirubin, exudative transudate effusion.

Introduction

The internal surfaces of the thoracic cavity are cover by pleura, includes a cover of mesothelial cells held up by a net of connective plus fibro elastic tissue. Usually, a small amount of fluid within the pleural space works like a lubricant to decrease friction amid chest wall and lung at inspiration and expiration. This fluctuation of fluid is based on the oncotic in addition to hydrostatic pressures within the parietal plus visceral pleura as well as the pressure inside the pleural space its own. Fluid is drained out mostly through lymphatics within the parietal pleura¹. Transudative pleural effusions derive from general illnesses that may not directly affect the pleura but alternatively provide an asymmetry of Starling’s forces, ending in moving of fluid within the pleural space. The analysis for transudates involve recognition of the systemic illnesses like nephrotic syndrome, congestive heart failure and cirrhosis with ascites. Treating these effusions is done by management of the underlying illness. After injury that occur in pleural surface, exudative effusions result. Intrapleural illness can be suggested by the presence of exudative effusion². In order to differentiate exudative from
transudative pleural effusion, Light et al. established\(^3\) a criteria to do so with sensitivity 99% and specificity 98% that include pleural protein/serum protein of >0.5, pleural LDH/serum LDH of >0.6 and an estimated level of LDH in the pleural fluid more than two thirds LDH serum level. Yet other studies investigating Light’s criteria showed a specificity of 70-86% and about 25% of cases identified by Light’s criteria to have exudative pleural effusion have a transudate effusion\(^4\). It has been found by Meta-analysis study on this subject that there is no single test could clearly differentiate between transudative and exudative pleural effusion\(^5,6\). Leukocytes and erythrocytes’ degeneration will increase the concentration of cholesterol inside pleural cavity. Another theory is that cholesterol of pleura originates from plasma; 70% of plasma cholesterol is low density lipoproteins (LDL), and the rest is very low density lipoproteins (VLDL) or high density lipoproteins (HDL), so plasma cholesterol enter pleural cavity after increased permeability of pleural vessels\(^7\). Pleural fluid bilirubin with pleural serum ratio of >0.6 is suggestive of an exudate with a sensitivity and specificity of 90.6% and 96.2%, respectively\(^8\). In non-diagnosed exudative effusions measuring the glucose level is of particular importance in which a decreased glucose level in the pleural fluid (<60 mg/dL) can limit the possible diagnosis to either one of these: rheumatoid and tuberculous effusion, Para-pneumonic and hemothorax or malignant effusion and the Churg-Strauss syndrome\(^9\). In Parapneumonic effusion, glucose level in pleural fluid < 40 mg/dL, so for treatment this case needstube thoracostomy. In rheumatoid effusions a glucose level in pleural fluid <30 mg/dL\(^10\). While in systemic lupus erythematosus (SLE) a glucose level in pleural fluid > 80 mg/dL\(^11\). In case of pleural effusion secondary to malignancy usually have a low glucose level and a positive cytology in the pleural fluid\(^12\). This study aims to assessing the value of pleural fluid bilirubin and cholesterol levels in differentiating the transudative from exudative pleural effusion in comparison to Light’s criteria.

**Method**

A prospective study in which 50 patients with pleural effusion age ranges from 25-70 years where admitted at the medical department at Al-Imamein Kadhimine Medical City. The study period was conducted from April 2013 to January 2014. Thirty patients (60%) were males and 20 patients (40%) were females. Inclusion Criteria: Age ≥ 16 years, patients with definite diagnosis of pleural effusion on clinical and radiological imaging.

**Exclusion Criteria:** Patients <16 years old, patients with undiagnosed pleural effusion, diagnosed patients who are on treatment, pleural effusion with renal insufficiency or pulmonary embolism because both can cause transudative and exudative effusion that can affect the result of our study. Following a thorough history, physical examination, the pleural effusion was confirmed and localized by chest X-ray. Diagnostic pleural fluid tapping was done in each case, in some cases ultrasound guided localization of effusion was done. The samples then were examined for glucose, white blood cell count, LDH, cholesterol, bilirubin, protein, acid fast stain, Gram stain, bacterial culture, and cytology. The pleural effusions were categorized as exudative and transudative according to the causative etiology, the Light’s criteria, pleural bilirubin/serum bilirubin > 0.6 mg/dL and cholesterol in pleural (considering a value of 45 mg/dL as cutoff point). Statistical analysis: The measured biochemical parameters usefulness for identifying exudates was assessed with Bayesian method in order to calculate the sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and accuracy of each parameter. The statistical significance measured by X2 analysis to test differences between means. A P value <0.05 considered significant.

**Results**

The mean age of the 50 patients included in the study was 51.6±14.9 years (range, 25-70 years); table 1 shows the age and gender distribution among patients with pleural effusion according to.

<table>
<thead>
<tr>
<th>Type of pleural effusion</th>
<th>No. (%)</th>
<th>Sex</th>
<th>Age (Mean±SD) Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male No. (%)</td>
<td>Female No. (%)</td>
</tr>
<tr>
<td>Exudate</td>
<td>36 (72%)</td>
<td>18 (36%)</td>
<td>18 (36%)</td>
</tr>
<tr>
<td>Transudate</td>
<td>14 (28%)</td>
<td>12 (24%)</td>
<td>2 (4%)</td>
</tr>
<tr>
<td>Total</td>
<td>50 (100%)</td>
<td>30 (60%)</td>
<td>20 (40%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<th>No. (%)</th>
<th>Sex</th>
<th>Age (Mean±SD) Years</th>
</tr>
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<tbody>
<tr>
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</tr>
<tr>
<td>Total</td>
<td>50 (100%)</td>
<td>30 (60%)</td>
<td>20 (40%)</td>
</tr>
</tbody>
</table>

**Table 1:** The type of pleural effusion on clinical basis and its association with the sex & age:
In this study tuberculous effusion was the most common cause of pleural effusion in 24 patients (48%), heart failure was the second most common cause in 10 patients (20%), followed by malignancy in 8 patients (16%), Para pneumonic effusion in 4 patients (8%) and liver cirrhosis in 4 patients (8%) as shown in table 2.

**Table 2: The type of pleural effusion and its causes:**

<table>
<thead>
<tr>
<th>Type of pleural effusion</th>
<th>No. (%)</th>
<th>The cause</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exudate</td>
<td>36 (72%)</td>
<td>Tuberculosis</td>
<td>24 (48%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Malignancy</td>
<td>8 (16%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Para pneumonic</td>
<td>4 (8%)</td>
</tr>
<tr>
<td>Transudate</td>
<td>14 (28%)</td>
<td>Heart failure</td>
<td>10 (20%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Liver cirrhosis</td>
<td>4 (8%)</td>
</tr>
<tr>
<td>Total</td>
<td>50 (100%)</td>
<td></td>
<td>50 (100%)</td>
</tr>
</tbody>
</table>

The practicality of each of the factors for recognizing exudate and transudate were evaluated in terms of sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), accuracy and P-value as shown in table 3.

**Table 3: Factors for identifying exudate and transudate**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>PPV</th>
<th>NPV</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein ratio</td>
<td>88%</td>
<td>85%</td>
<td>94%</td>
<td>75%</td>
<td>88%</td>
</tr>
<tr>
<td>LDH ratio</td>
<td>100%</td>
<td>71%</td>
<td>90%</td>
<td>100%</td>
<td>92%</td>
</tr>
<tr>
<td>Fluid cholesterol</td>
<td>94%</td>
<td>100%</td>
<td>100%</td>
<td>87%</td>
<td>96%</td>
</tr>
<tr>
<td>Bilirubin ratio</td>
<td>88%</td>
<td>85%</td>
<td>94%</td>
<td>75%</td>
<td>88%</td>
</tr>
</tbody>
</table>

**Table 4: Distinguishing exudative from transudative effusion in pleural according protein ratio & fluid cholesterol**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Exudate</th>
<th>Transudate</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein ratio</td>
<td>32 64%</td>
<td>12 24%</td>
<td>0.6</td>
</tr>
<tr>
<td>Fluid cholesterol</td>
<td>34 68%</td>
<td>14 28%</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Thirty two patients (64%) had been diagnosed to have exudative pleural effusion and 12 patients (24%) had been diagnosed to have transudative pleural effusion using fluid protein/serum protein ratio (protein ratio) while 34 patients (68%) had been diagnosed to have exudative pleural effusion and 14 patients (28%) had been diagnosed to have transudative pleural effusion using fluid cholesterol. P-value = 0.6 which means there is no significant difference between protein ratio and fluid cholesterol in differentiating exudative from transudative pleural effusion as shown in table 4.

Thirty two patients (64%) had been diagnosed to have exudative pleural effusion and 12 patients (24%) had been diagnosed to have transudative pleural effusion using fluid protein/serum protein ratio (protein ratio) while 32 patients (64%) had been diagnosed to have exudative pleural effusion and 12 patients (24%) had been diagnosed to have transudative pleural effusion using fluid bilirubin/serum bilirubin ratio (bilirubin ratio). There is no significant difference between protein ratio and bilirubin ratio in distinguishing exudative from transudative effusion of pleural P-value > 0.05 as shown in table 5.
Table 5: Diagnostic comparison between protein ratio & bilirubin ratio in distinguishing exudative from transudative effusion of pleura

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Exudate</th>
<th>Transude</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Protein ratio</td>
<td>32</td>
<td>64</td>
</tr>
<tr>
<td>Bilirubin ratio</td>
<td>32</td>
<td>64</td>
</tr>
<tr>
<td>P-value</td>
<td>1.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Thirty six patients (72%) had been diagnosed to have exudative pleural effusion and 10 patients (20%) had been diagnosed to have transudative pleural effusion using fluid LDH/serum LDH ratio (LDH ratio) while 34 patients (68%) had been diagnosed to have exudative pleural effusion and 14 patients (28%) had been diagnosed to have transudative pleural effusion using fluid cholesterol. P-value = 0.6 and 0.3 which means there is no significant difference between LDH ratio and fluid cholesterol in differentiating exudative from transudative pleural effusion as shown in table 6.

Table 6: Distinguishing exudative from transudative effusion in pleural according LDH ratio & fluid cholesterol.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Exudate</th>
<th>Transude</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>LDH ratio</td>
<td>36</td>
<td>72</td>
</tr>
<tr>
<td>Fluid cholesterol</td>
<td>34</td>
<td>68</td>
</tr>
<tr>
<td>P-value</td>
<td>0.6</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Thirty six patients (72%) had been diagnosed to have exudative pleural effusion and 10 patients (20%) had been diagnosed to have transudative pleural effusion using fluid LDH/serum LDH ratio (LDH ratio) while 34 patients (68%) had been diagnosed to have exudative pleural effusion and 14 patients (28%) had been diagnosed to have transudative pleural effusion using fluid bilirubin/serum bilirubin ratio (bilirubin ratio). There is no significant difference between LDH ratio and bilirubin ratio in distinguishing exudative from transudative effusion of pleura.

Discussion

From all 50 cases included in the study, 72% of them (36 patients) found to had exudative effusion, and 28% of them (14 patients) found to had transudative effusion based on the clinical diagnosis as shown in table 1. Tuberculosis being the most common diagnosis in exudative pleural effusion with a 48% (24 patients) followed by malignancy {8 patients (16%)} as shown in table 2, this result is consistent with C. K. Liam et al. study that showed tuberculosis as one of the most common causes of exudative effusion of pleura(13). In our study using light’s criteria the results had a sensitivity of 88% for protein ratio and 100% for LDH ratio with a specificity of 85% for protein ratio and 71% for LDH ratio as shown in table 3. According to Light et al. study the difference between exudative and transudative effusion of pleural was done with high accuracy and nearly 100% sensitivity and specificity both using LDH and protein levels in both serum and pleural fluid(3), being highly accurate and widely affordable the Light et al criteria had been the gold standard for initial categorization of pleural effusions. Yet many several followed studies failed to reproduce a similar excellent result. However many of the studies, used Light et al. criteria showed that the sensitivity for exudates effusion identification mainly remain greater than 95%, but the specificity had not exceed 78%(14). In this study 32 patients (64%) had exudative pleural effusion and 12 patients (24%) had transudative pleural effusion using fluid bilirubin/serum bilirubin ratio while 34 patients (68%) had exudative pleural effusion and 14 patients (28%) had transudative pleural effusion using pleural fluid cholesterol level. With a P-value of 0.6 means that the difference between pleural fluid cholesterol and protein ratio is statistically non-significant difference between exudative and transudative effusion of pleural, moreover, 36 patients (72%) had exudative pleural effusion and 10 patients (20%) had transudative pleural effusion using fluid LDH/serum LDH ratio while 34 patients (68%) had exudative pleural effusion and 14 patients (28%) had transudative pleural effusion using pleural fluid cholesterol level. P-value = 0.6 and 0.3 which means there is no significant difference between LDH ratio and pleural fluid cholesterol level in differentiating exudative from transudative effusion as shown in tables 4 and 6 respectively. Like studies done by Romero et al in which sensitivity plus specificity of Light’s measures for the transudates and exudates, and diagnostic exactness of Light measures and how cholesterol in pleural cavity improve this diagnosis(15). In another study done by Saad Abdul-Razzak Z. at 2001, he also found that pleural cholesterol level had a high sensitivity (100%) in differentiating exudative from transudative pleural effusion and no significant difference between protein in pleural fluid and cholesterol level in the identification of transudative from exudative effusion(16). In the current
study 32 patients (64%) had exudative pleural effusion and 12 patients (24%) had transudative pleural effusion using fluid protein/serum protein ratio while 32 patients (64%) had exudative pleural effusion and 12 patients (24%) had transudative pleural effusion using fluid bilirubin/serum bilirubin ratio. P-value = 1.0 which means there is no significant difference between protein ratio and bilirubin ratio regarding the differentiation of transudative and exudative effusion also 36 patients (72%) had exudative pleural effusion and 10 patients (20%) had transudative pleural effusion using fluid LDH/serum LDH ratio while 32 patients (64%) had exudative pleural effusion and 12 patients (24%) had transudative pleural effusion using fluid bilirubin/serum bilirubin ratio. P-value = 0.3 and 0.6 which means there is no significant difference between LDH ratio and bilirubin ratio in distinguishing exudative from transudative effusion of pleura as shown in table 5. This results also found in a study done by Meisel et al in which they found that the bilirubin qualifying measure comes to the well-accepted LDH in addition to protein criteria and may even work as another qualifying measure to differentiate an exudative from transudative pleural effusions(17).

**Conclusion**

For distinguishing exudative in addition to transudative pleural effusion. Computing pleural fluid cholesterol level carries a superior sensitivity, specificity in addition to positive predictive value comparing to Light’s criteria parameters, and it is a more cost effective, easier and more efficient way in differentiating transudates from exudates along with the ratio of Pleural/serum bilirubin has the same advantage of cost effectiveness and the easiness.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

**References**


Determine the Effect of Polymorphisms of and IL23R Genes on in Psoriasis in Babylon Province

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¹Lecturer, ²Assiss. Prof., Faculty of Medicine, Babylon University, Iraq

Abstract

Background: IL23R Polymorphisms appear to be engaged with several different types of autoimmune diseases such as psoriasis.

Aim: We investigated the association of the Arg381Gln (R381Q) polymorphism in the IL23R gene with psoriasis risk in Babylon province.

Methodology: The IL23R-gene variation Arg381Gln (R381Q) was performed using the programmable thermal cycler gradient PCR system. We investigated the association of IL23R gene variants with different clinic pathological features of psoriasis patients.

Results: The allelic frequency of IL-23R Arg381Gln (R381Q) (rs11209026) gene showed that the frequency of AA genotype in patients with Psoriasis was more than in the control group (13 vs 8%) (OR = 2.222, CI 95% (0.476-10.357). In addition, this study suggests there is a statistical difference (P-valu>0.05) between (AG) and (AA) (P-value = 0.033), (AG) and (GG) (P-value = 0.012) genotypes in patients group compared to controls. The results also showed that the frequency of (G) Arg allele was (0.6) (0.62) in patients and control group respectively, and found no significant difference between (A) Gln and (G) Arg alleles in patients and controls (OR= 0.754), CI 95% (0.42-1.22).

Conclusion: Our results showed no significant association of the IL-23R Arg381Gln (R381Q) (rs11209026) polymorphism with psoriasis patients susceptibility in Babylon province. The IL-23R Arg381Gln heterozygote significantly increases the risk and can’t be useful as a predisposing genetic marker.

Keywords: Psoriasis, polymorphism, IL-23R Arg381Gln, Health; skin.

Introduction

Psoriasis is an immune-mediated proliferative skin disorder and chronic inflammatory disease that predominantly involves the skin, nails, and joints that have a prevalence of 3% worldwide(¹). The disease happens in the different age groups with less than 10 years occurrences is rare (incidence 0.3-0.5), and greatly between 15-40 years(²). The main reason is still unknown, historically, psoriasis is considered a primary disorder of keratinocyte(³,⁴). There is hyper-proliferation of keratinocytes and alteration in differentiation Genetic abnormality leads to keratinocytes hyper-proliferation which in turn, produces a defective skin barrier allowing the penetration of antigens which resulting in the immune response to that antigen (Ag)(⁵). Recently the genetic mapping of the MHC Class I show that region indicates that HLA-Cw6 itself is probable to be the functional variable predisposing to psoriasis, rather than sing for some other disease gene neighbor. This finding provides a molecular target for the explanation of the immunologic basis of psoriasis(⁶,⁷). TNF- α (Tumor necrosis factor-alpha), IL-17 (interleukin 17), IL-6 is a group of inflammatory cytokines produced by human

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adipose tissue and plays a significant role in the begin of insulin resistance, dyslipidemia, D.M and finally cardiac disease in psoriatic patients (8). An adipose tissue macrophage is responsible for producing inflammatory cytokines α-TNF, IL-6, 7, 8, 17, 18, 23 in response to adipose tissue inflammation, which leads to increasing the level of this cytokines, and resulting in endothelial cell damage and atherosclerotic plaque additionally to initiation of psoriasis(9). This study aimed to identify the influence of IL23R gene rs11209026 SNPs variant on the susceptibility of developing psoriasis.

**Materials and Method**

**DNA Extraction:** DNA was extracted by the procedure depending on the manufacture protocol and was detected by using the agarose gel electrophoresis technique.

**IL-23RArg381Gln (R381Q) (rs11209026) genotyping:** Amplification IL23R gene was done by polymerase chain reaction (PCR). Amplification was performed in a programmable thermal cycler gradient PCR system that allows amplification of test DNA only when the target allele is contained within the sample. PCR-restriction fragment length polymorphism was used to investigate the polymorphism (rs11209026, Arg381Gln, R381Q) in the IL-23 receptor (IL23R) gene in control and psoriasis patients involved in this study. Optimization of PCR-RFLP conditions was done by using:

The different volumes of primer (1 µl, and 1.5 µl), Gradient annealing temperature and choosing the conditions that gave the best result.

A master premix of Promega® was used as mentioned with PCR conditions. Master premix components Top DNA polymerase 1 U/µl), Each: dNTP(250 mM), Tris-HCl (pH 9.0) 10 mM, KCl(30 mM), MgCl2 (1.5 mM),Stabilizer and tracking dye.

**Amplification conditions of IL-23RArg381Gln (R381Q) genotyping:** The amplification conditions used were at 94 C for 5 minutes followed by 94C for 1 min, 61 C for 1 min, 72 C for 1 min followed by the final extension at 72 C for 5minutes. The amplification products were separated by electrophoresis through 1.5 % agarose gel stained with ethidium bromide and visualized on a UV transilluminator. Primers F and R flank the exon of the IL-23R Arg381Gln (R381Q) gene, resulting in a band of 508bp to act as a control for DNA quality and quantity.

**Results**

The results of the present study showed that the frequency of AA\Arg/Arg genotype/phenotype in patients with Psoriasis was more than in the control group (13 vs 8%)(OR = 2.222, CI 95% (0.476-10.357). In addition, this study suggests there is a statistical difference (P-valu>0.05) between (AG) (Arg/Gln and (AA) Gln/Gln (P-value = 0.033), (AG) Arg/Gln and (GG) Arg/Arg (P-value = 0.012) genotypes/phenotype in patients group compared to controls. The results also showed that the frequency of (G) Arg allele was (0.6) (0.62) in patients and control group respectively, and found no significant difference between (A) Gln and (G) Arg alleles in patients and controls (OR= 0.754), CI 95% (0.42-1.22). The rs11209026 IL23R variant was a protective marker. Recent studies have shown that a functional single nucleotide polymorphism (SNP) (Arg381Gln; R381Q; rs11209026; 1142 G wild-type A reduced function) in the IL-23R gene (in exon 9) led to decreased IL-23- dependent IL-17 production (Guan et al. 2012). The disease-protective R381Q IL-23R may result in a loss of function, in primary human CD4+ and CD8+ T-cells, leading to decreases in IL-23/TH17 pathway cytokine production.

**Study Population:** All demographic characteristics of the subjects are shown as follows a total of 45 psoriasis patients and the same number of gender-matched healthy control wereanalyzed. This research was confirmed by the Research ethics committee, University of Babylon college of medicine. Blood(5ml) samples were collected from participants in EDTA and gel tubes.
Discussion

A survey by Di Meglio and Suggested that IL-23R RQ381 exerted its protective effects by attenuation of IL-23-induced TH17 functions (IL-17A production) without interfering with TH17 differentiation (10). Further, Sarin et al. 2011 showed that CD4 and CD8+ T-cells from healthy R381Q IL-23R carriers had decreased IL-23-dependent IL-17 and IL-22 production relative to WT (wild-type; G allele) cells Several mechanisms might contribute to these observations, including a reduced capacity of IL23RQ381 to activate STAT proteins due to an impaired association of JAK2 proteins with the cytoplasmic tail of the receptor(11). As a result, R381Q CD8+ and TH17 CD4+ T-cells displayed decreased IL-23- and STAT3-dependent expansion, STAT3 phosphorylation, and STAT3 activation compared with WT cells. This SNP was also associated with a lower percentage of circulating TH17 and TC17 cells. Abdollahi et al. 2015 reported that the number and activity of both circulating TH17 cells and in vitro (ex vivo)-differentiated TH17 cells did not differ between G and A allele carriers(12). This finding supported the belief for a major role for IL23 in the generation of TH17 cell effector responses during tissue inflammation (rather than in systemic inflammation) and demonstrated the importance of IL-23 in mediating TH17 effector responses in humans. Those results also provided support for a critical role for the IL-23/IL-23R signaling in generating pathogenic TH17 responses. Further, those studies explained the protective role of R381Q in autoimmune disorders and further supported the hypothesis that blocking the IL-23 pathway could lead to improvements in hosts with autoimmune disorders like psoriasis(13). Raymond et al. 2015 investigated another mechanism of function for this SNP. The results of that study showed the R381Q variant promoted the expression of a soluble IL-23R-encoding mRNA species. The R381Q polymorphism altered the IL-23R alpha-chain mRNA splicing and favored exon 9 skipping by reducing the binding of the splicing enhancer SF2. This enhanced expression of the D9 mRNA consequently diminished IL-23 signaling. Multiple splice forms of the human IL23R transcript exist and one, D9, encodes a soluble form of the receptor. Thus, a presence of an R381Q variant increases the expression of the soluble form of IL23R mRNA (which, in turn, functions as a decoy receptor) and lowers the ability of a host to develop a TH17 phenotype upon IL-23 stimulation (14). This study that we mention it agrees with our present study that patient or control that have (AA)Gln/Gln genotype/phenotype have (OR=2.222) chance possible disease occurrence and (GG)Arg/Arg genotype/phenotype have (2.074) possible chance disease when we compare with the reference group (AG) Gln/Arg that consider a protective. In conclusion, our result showed no significant correlation with IL-23R Arg381Gln (R381Q) gene in over dominant model there are no significant increases in the risk of psoriasis and it’s can’t be useful as a predisposing genetic marker for psoriasis.

Figure (1): Amplification and PCR product (508bp) picture ofPCR products of the interleukin 23 (IL-23R) receptor on 1.5% agarose. M= DNA Marker(ladder)(50 bp), (1 -19),508 bp PCR amplicons of IL-23R gene of patients group.
Figure (2): Amplification and PCR product (508bp) picture of PCR products of the interleukin 23 (IL-23R) receptor on 1.5% agarose. M= DNA Marker(ladder) (50 bp), (1 -12), 508 bp PCR amplicons of IL-23R gene of control group.

Figure (3): Electrophoretic picture (PAGE) represents restriction fragment length polymorphism assay (PCR-RFLP) for rs11209026 IL-23R (G1142A) genotyping, where lane M is 50 bp DNA marker(ladder), lane (1,2,5,6,7,8,9,10) (3 bands) represent of mutant allele, lane (3,4,11) (4 bands) represent of wild-type allele, and lane (12,13,14) (1 band) represent cases have both, normal and mutant allele. (PAGE: Polyacylamide gel electrophoresis 6%).
Table (1): The forward and reverse primers

<table>
<thead>
<tr>
<th>Primers</th>
<th>Sequence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward primer</td>
<td>5’-CTTTTCTGGCAGGGTCATTTC-3’</td>
<td>80</td>
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<tr>
<td>Reverse primer</td>
<td>5’-AAATGTGTTTTCTGGGGTGTTTG-3’</td>
<td></td>
</tr>
</tbody>
</table>

Table (2): Genotyping of IL-23R rs11209026 Arg381Gln (R381Q) polymorphism and allele frequency.

<table>
<thead>
<tr>
<th>Groups</th>
<th>IL-23R Genotype (Arg381Gln)</th>
<th>Total</th>
<th>Allele frequency (p+q=1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AA</td>
<td>AG</td>
<td>GG</td>
</tr>
<tr>
<td>Control N=40</td>
<td>3 (8%)</td>
<td>28 (70%)</td>
<td>9(22%)</td>
</tr>
<tr>
<td>Patien N=40</td>
<td>5 (13%)</td>
<td>21 (52%)</td>
<td>14(35%)</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>49</td>
<td>23</td>
</tr>
<tr>
<td>(chi² Test) p-value</td>
<td>NS</td>
<td>S</td>
<td>S</td>
</tr>
</tbody>
</table>

Table (3): IL-23R rs11209026 Arg381Gln (R381Q) gene polymorphism characterization in patient and control groups

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Patient</th>
<th>Control</th>
<th>Odd ratio</th>
<th>CI 95%</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>5 (13%)</td>
<td>3 (8%)</td>
<td>2.222*</td>
<td>0.476-10.357</td>
<td>0.033</td>
</tr>
<tr>
<td>AG</td>
<td>21 (52%)</td>
<td>28 (70%)</td>
<td>Reference group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GG</td>
<td>14 (35%)</td>
<td>9 (22%)</td>
<td>2.074*</td>
<td>0.754-5.687</td>
<td>0.012</td>
</tr>
<tr>
<td>A</td>
<td>40%</td>
<td>38%</td>
<td>0.754</td>
<td>0.42-1.22</td>
<td>0.771</td>
</tr>
<tr>
<td>G</td>
<td>60%</td>
<td>62%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*: significant (p-value<0.05)

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: None

Funding: Self-funding

References


Interatrial Electromechanical Conduction Delay by ECG P-Wave and Echocardiographic Tissue Doppler Imaging for Diabetics Attending Merjan Teaching Hospital, A Comparison Study

Jabbar Sirhan Hassan¹, Safaa J. Kadhim², Oday J. Al-Salih³

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Abstract

Objectives: The objective was to study the atrial electromechanical P-wave electrocardiography (ECG) gated measurement of conduction times by tissue Doppler echocardiography (TDI) and left atrial mechanical function and volumes, the non-invasive predictors of atrial fibrillation, in diabetics. Methods: The study conducted by analytic case-control study and included 100 adult patients (63 men, 37 women; mean age 50.49 ±8.1 years), diagnosed with diabetes mellitus according to the criteria of the Diabetes Association of America, and 100 adults healthy (50 men; 50 women; average age 49.25 ±9.8 years) as control. Tissue Doppler imaging (TDI) and conventional echocardiography study was done. Assessment of electromechanical delay was done with the onset of the surface ECG P-wave to the systolic ā-wave onset on TDI of the AV valve annulus of the septum, left and right ones. Using the disk method, the left atrial volumes were assessed. The mechanical function and volumes of the left atrium were computed. Results: The E/A and eˉ/aˉ mitral ratio was assessed by the left and septal annuli were the mean difference significantly less in diabetics than in controls (P=0.031) and (P=0.034 correspondingly. The electromechanical inter-atrial and intra-atrial delay were significantly greater within the diabetics, contrasted to controls (P<0.001) and (P=0.003) correspondingly. V olumes of active left atrial emptying (LAAEV) and the ratio of active left atrial ejection (LAAEF) were significantly higher in diabetics in comparison with controls (P =0.002) and (P<0.001) correspondingly. Both were significantly correlated to E/A and eˉ/aˉ. Conclusions: In diabetics, conduction times of the atrium by TDI and the dispersion of the P-wave by surface ECG were longer. Furthermore, the mechanical functions and volumes of the left atrium were affected by altering diastolic function in diabetics.

Keywords: Diastolic function, atrial fibrillation, electromechanical delay, Left atrial mechanical function, diabetic state.

Introduction

The duration time between atrial mechanical peak contraction and the electrical depolarization of the atrium is called atrial electromechanical delays (AEMDs). AEMDs prolongation might be considered as a sign to distinguish arrhythmia (PAF) in patients than in control and prediction of PAF occurrence in observational and case-control studies as Badran and his associates found(1). The clinical suggestion supports the opinion that atrial electromechanical conduction delay prolongation suggest left atrial remodeling electricity, that is fundamental for the AF maintenance(2). It is also an indicator to worse prospects in DM with valvar disease of the heart and HF(3). Oxidation stress is a principal
involving feature to endothelial vascular dysfunction in DM. It is ascribed for its multilayered character by lowering available nitric oxide (NO) and provoking pro-inflammatory reactions which aggravate oxidation stress degree. DM upsurges CVD hazard, yet in healthy persons, signifying an important demand to delineate the mechanism(4). Irregularities of atrial transmission were appraised with noninvasive methods by using TDI and ECG in previous studies(5) and also has been determined to be elongated in many diseases that influence the myocardium(6). Although the atrial conduction time indicates the electrical remodeling estimation of atrium, TDI and 2 simple P-wave maximal duration (P max) and P d markers might give information on extending the time of atrial conduction (7). Remodeling of atria, It might be electrical, operational and physical (8). A larger period of pressure (more than five weeks) can lead to damage (fibrosis and apoptosis) irreversibly. The remodeling however, manifests itself in atria as dilation lately.

Methods
A total of 100 consecutive DM patients were included between the November 2019 and May 2020, all participants were conducted by analytic case-control investigation. All sex and gender adult participants who were in sinus rhythm and diabetes mellitus, diagnosed by DM American Association criteria, taking antidiabetic therapy, in addition to adult age matched healthy volunteers, were included in this study. All contributors with a history of CAD, high BP, LVEDD hypertrophy, LVEF under 50%, primary CMP, valvar cardiac disease, arrhythmia, LBBB ECG, abnormal AV conduction, users for drugs that affect conduction system, thyroid dysfunction, electrolyte disturbance, Anemia, CKD, lung disease (COPD, sleep apnea), and inadequate quality of echo study and images of ECG were eliminated from the research. By 4-chamber outlook of heart apex, the pulsed Doppler sample volume was positioned at the LV mitral lateral annulus level, then successively, septal and tricuspid annuli. The period of time since the start on the surface ECG P-wave toward the start of the delayed diastolic a wave, named PA on TDI, was taken, starting from the lateral mitral annulus (PA lateral), septal mitral annulus (PA septal), the differentiation concerning PA lateral and PA septal (PA lateral- PA septal), was demarcated as intra-left, then septal with tricuspid was demarcated as intra-right atrial, then between mitral and tricuspid as EMD (inter-atrial). All dimensions were documented around a mean of 3 cycles of heart beats (9). Statistics study done by means of SPSS version 23. Categorical variables were given as percentages and rate of recurrence. Continuous variables were given as (mean ± S D). T-test of student has been accustomed toward contrasting averages between diabetic group and control. It was used that Chi-square test find the association between categorical variables. Correlation coefficients (r) were accustomed to assess the association between continuous variables. The significance of means was counted by p-value at ≤ 0.05*.

Results
Basic laboratory and clinical characteristics of 100 diabetics (mean age 50.49 ± 8.1 years) likewise 100 normal followers (average age 49.25 ± 9.8 years). The following parameters were significant in diabetics in comparison with the control in the following: body mass index (P=0.05*) heart rate (p=0.049*), low-density lipoprotein cholesterol (p=0.045*). White blood cell count (p=0.022*) and fasting blood glucose (p<0.001*) were considerably increasing in DM using the t-test for continuous variables. In addition, the diameter and volume index of LA were significant (p = 0.01*) respectively.

Table 1: TDI mean variables differences

<table>
<thead>
<tr>
<th>Variable</th>
<th>Diabetics (n=100)</th>
<th>Control (n=100)</th>
<th>t-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>50.49 ± 8.1</td>
<td>49.25 ± 9.8</td>
<td>0.975</td>
<td>0.331</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>31.97 ± 2.36</td>
<td>30.94 ± 2.37</td>
<td>3.08</td>
<td>0.05*</td>
</tr>
<tr>
<td>BSA (m²)</td>
<td>1.97 ± 0.37</td>
<td>1.96 ± 0.38</td>
<td>0.203</td>
<td>0.839</td>
</tr>
<tr>
<td>SBP (mmHg)</td>
<td>120.63 ± 4.72</td>
<td>119.82 ± 5.39</td>
<td>1.135</td>
<td>0.258</td>
</tr>
<tr>
<td>Variable</td>
<td>Diabetics (n=100)</td>
<td>Control (n=100)</td>
<td>t-test</td>
<td>P-value</td>
</tr>
<tr>
<td>----------</td>
<td>------------------</td>
<td>----------------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>DBP (mmHg)</td>
<td>72.13 ±2.97</td>
<td>71.41 ±3.47</td>
<td>1.574</td>
<td>0.117</td>
</tr>
<tr>
<td>Heart rate (B/min)</td>
<td>76.59 ±7.95</td>
<td>74.6 ±6.12</td>
<td>1.983</td>
<td>0.049*</td>
</tr>
<tr>
<td>Hb(g/d L)</td>
<td>14.21 ±1.06</td>
<td>14 ±0.98</td>
<td>1.455</td>
<td>0.147</td>
</tr>
<tr>
<td>WBC (103/mL)</td>
<td>8.43 ±1.40</td>
<td>7.97 ±1.36</td>
<td>2.306</td>
<td>0.022*</td>
</tr>
<tr>
<td>LDL-C (mg/d L)</td>
<td>132.48 ±16.02</td>
<td>128.25 ±13.48</td>
<td>2.02</td>
<td>0.045*</td>
</tr>
<tr>
<td>FBG (mg/d L)</td>
<td>148.6 (92-361)</td>
<td>91.67 (77-119)</td>
<td>6.385</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Creatinine (mg/dl)</td>
<td>0.8 ±0.101</td>
<td>0.775 ±0.1</td>
<td>1.759</td>
<td>0.08</td>
</tr>
<tr>
<td>LVEDD (mm)</td>
<td>47.59 ±3.18</td>
<td>46.82 ±2.4</td>
<td>1.933</td>
<td>0.055</td>
</tr>
<tr>
<td>LVESD (mm)</td>
<td>29.37 ±1.96</td>
<td>28.87 ±1.84</td>
<td>1.86</td>
<td>0.064</td>
</tr>
<tr>
<td>IVS thickness(mm)</td>
<td>9.32 ±4.09</td>
<td>8.24 ±3.4</td>
<td>2.03</td>
<td>0.044*</td>
</tr>
<tr>
<td>PW thickness(mm)</td>
<td>9.3 ±1.5</td>
<td>8.9 ±1.48</td>
<td>1.898</td>
<td>0.059</td>
</tr>
<tr>
<td>LV mass index (g/m2)</td>
<td>90.26 ±11.81</td>
<td>88.94 ±9.18</td>
<td>0.882</td>
<td>0.377</td>
</tr>
<tr>
<td>Aortic diameter (mm)</td>
<td>28.1 ±12.22</td>
<td>27.85 ±1.37</td>
<td>1.363</td>
<td>0.175</td>
</tr>
<tr>
<td>LA-diameter (mm)</td>
<td>32.8 ±1.98</td>
<td>32.2 ±1.21</td>
<td>2.586</td>
<td>0.01*</td>
</tr>
<tr>
<td>LA-volume-index (mL/m2)</td>
<td>31.45 ±2.8</td>
<td>30.7 ±2.4</td>
<td>2.034</td>
<td>0.043*</td>
</tr>
<tr>
<td>LV EF (%)</td>
<td>67.2 ±2.8</td>
<td>67.37 ±2.1</td>
<td>-0.486</td>
<td>0.63</td>
</tr>
<tr>
<td>PAP systolic (mmHg)</td>
<td>22.16 ±2.19</td>
<td>22.07 ±2.05</td>
<td>0.29</td>
<td>0.765</td>
</tr>
</tbody>
</table>

**1. Conventional-Doppler Parameters**

| Mitral E velocity (cm/s) | 81.79 ±8.30 | 82.43 ±7.6 | -0.569 | 0.57 |
| Mitral A velocity (cm/s) | 79.2 ±9.32 | 76.85 ±8.25 | 1.888 | 0.06 |
| E/A | 1.085 ±0.14 | 1.125 ±0.12 | -2.169 | 0.031* |
| DT (m s) | 182.74 ±8.45 | 180.6 ±7.9 | 0.966 | 0.065 |
| IVRT (m s) | 94.27 ±7.90 | 92.64 ±6.2 | 2.021 | 0.045* |

**2. Tissue Doppler Parameters**

### A. LV lateral annulus

| s (cm/s) | 10.16 ±1.07 | 10.14 ±1.06 | 0.133 | 0.89 |
| a (cm/s) | 11.56 ±1.35 | 11.2 ±1.3 | 1.921 | 0.06 |
| e (cm/s) | 11.02 ±1.21 | 11.32 ±1.09 | -1.842 | 0.067 |
| e/a | 0.98 ±0.158 | 1.025 ±0.140 | -2.132 | 0.034* |
| E/e | 7.35 ±2.4 | 6.7 ±1.96 | 2.098 | 0.038* |
| MPI | 0.61 ±0.08 | 0.592 ±0.07 | 1.693 | 0.092 |

### B. RV lateral annulus

| s (cm/s) | 16.7 ±2.45 | 16.57 ±2.92 | 0.341 | 0.73 |
| a (cm/s) | 18 ±3.4 | 17.6 ±3.2 | 0.857 | 0.393 |
| e (cm/s) | 12.96 ±2.87 | 13.48 ±3.2 | -1.21 | 0.23 |
| e/a | 0.72 ±0.29 | 0.81 ±0.31 | -2.12 | 0.036* |

P-wave indicators and parameters of TDI have been taken in table 3. P max duration (p = 0.019*) and P d (p< 0.001*) were considerably larger in DM respectively. The duration of P min was shorter in patients with DM (p = 0.031*). The duration of conduction delay in tricuspid lateral PA (p <0.001*), septum PA (p <0.001*) and MV PA (p <0.001*) have been significantly elongated in patients with DM in comparison to control respectively.
In addition, the ratio of conduction delay duration for each annulus to LA diameter were significantly more in DM in comparison with controls. In addition, the interatrial (p < 0.001*), right intra-atrial (p = 0.003*) and left intra-atrial (p = 0.004*) EMD were significantly higher in patients with DM than in controls correspondingly. The volume of the active emptying of the left atrium (LAAEV) and the fraction (LAAEF) were significantly greater in diabetics than in controls (p = 0.004*). LAAEF and LAAEV were significantly correlated with septal and lateral, E/A, e⁻/a⁻. Maximum left atrial volume (V max) mean difference (P = 0.019*) was significantly more in diabetics. Presystolic atrial volume (V p) (p = 0.036*) were highly significant in diabetics. The minimum volume (V min), the volume of passive left atrial emptying (LAPEV) means were lower in diabetic than control means. We found that conduit left atrium volume (CV) and left atrial total emptying volume (LATEV) were statistically significant in diabetics than control.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Diabetics (n=100)</th>
<th>Control (n=100)</th>
<th>t-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>P max (m s)</td>
<td>104.7 ±9.5</td>
<td>101.8 ±7.75</td>
<td>2.365</td>
<td>0.019*</td>
</tr>
<tr>
<td>P min (m s)</td>
<td>65.95 ±4.54</td>
<td>67.1 ±4.41</td>
<td>-1.817</td>
<td>0.031*</td>
</tr>
<tr>
<td>P d (m s)</td>
<td>39 ±5.20</td>
<td>34.05 ±3.11</td>
<td>8.252</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>PA- lateral (m s)</td>
<td>63.69 ±4.59</td>
<td>52.87 ±3.33</td>
<td>19.08</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>PA - septum (m s)</td>
<td>55.22 ±4.59</td>
<td>46.66 ±3.84</td>
<td>14.304</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>PA – tricus. (m s)</td>
<td>46.2 ±4.52</td>
<td>40.51 ±2.97</td>
<td>10.521</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>PA-latr/LA-diam (ms/mm)</td>
<td>1.877 ±0.15</td>
<td>1.68 ±0.09</td>
<td>11.262</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>PA-sept/LA-diam (ms/mm)</td>
<td>1.62 ±0.14</td>
<td>1.48 ±0.09</td>
<td>8.412</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>PA-tricus/LA-diam (ms/mm)</td>
<td>1.35 ±0.13</td>
<td>1.3 ±0.10</td>
<td>3.049</td>
<td>0.003</td>
</tr>
<tr>
<td>PA-lat-PA-tricus (m s)</td>
<td>17.48 ±3.90</td>
<td>12.21 ±2.12</td>
<td>11.872</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>PA-sep-PA tricus. (m s)</td>
<td>9.07 ±6.3</td>
<td>6.9 ±3.4</td>
<td>3.031</td>
<td>0.003*</td>
</tr>
<tr>
<td>PA-lat-PA sep (m s)</td>
<td>7.2 ±5.6</td>
<td>5.3 ±3.4</td>
<td>2.9</td>
<td>0.004*</td>
</tr>
<tr>
<td>V max, mL/m²</td>
<td>30.6 ±7.76</td>
<td>28.58 ±6.98</td>
<td>1.935</td>
<td>0.054</td>
</tr>
<tr>
<td>V p, mL/m²</td>
<td>21 ±7.3</td>
<td>19.1 ±5.2</td>
<td>2.12</td>
<td>0.036*</td>
</tr>
<tr>
<td>V min, mL/m²</td>
<td>10.69 ±1.71</td>
<td>12.9 ±6.2</td>
<td>-2.841</td>
<td>0.005*</td>
</tr>
<tr>
<td>LAPEV, mL/m²</td>
<td>9.31 ±5.3</td>
<td>10.39 ±4.1</td>
<td>-1.836</td>
<td>0.068</td>
</tr>
<tr>
<td>LAPEF, %</td>
<td>0.31 ±0.12</td>
<td>0.35 ±0.17</td>
<td>-1.922</td>
<td>0.056</td>
</tr>
<tr>
<td>CV, mL/m²</td>
<td>16.3 ±4.83</td>
<td>15 ±3.76</td>
<td>2.124</td>
<td>0.03*</td>
</tr>
<tr>
<td>LAAEV, mL/m²</td>
<td>10.97 ±4.75</td>
<td>9.17 ±2.89</td>
<td>3.237</td>
<td>0.002</td>
</tr>
<tr>
<td>LAAEF, %</td>
<td>0.508 ±0.153</td>
<td>0.432 ±0.17</td>
<td>3.323</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>LATEV, mL/m²</td>
<td>20.84 ±7.3</td>
<td>18.2 ±5.4</td>
<td>2.907</td>
<td>0.004*</td>
</tr>
</tbody>
</table>

study of the association amongst diastolic function and the considerations representing the mechanical left atrial function and volumes revealed that there had been a significantly negative correlation among LAAEF, LAAEV with mitral E/A fraction (r = -0.295, p < 0.007; r = -0.450, p = 0.000, correspondingly), lateral mitral e⁻/a⁻ (r = -0.280, p = 0.020; r = -0.263, p = 0.018, correspondingly), then tricuspid e⁻/a⁻ (r = -0.342, p = 0.003; r = -0.416, p = 0.006, correspondingly). In the same way, there has been a significant though fragile negative correlation between E/A ratio and interatrial EMCD, LAEMCD (r = -0.295, p = 0.004; r = -0.382, p = 0.000, correspondingly). We presented the investigation of multivariate regression upon intra-atrial EMCD, interatrial EMCD in addition to LAEMCD in isolation. Analysis of Regression showed the chief factors associated with LAEMCD which were mitral E/A fraction, tricuspid e⁻/a⁻, and FBG (β = -0.34, p = 0.06; β
= 0.31, \( p = 0.043 \); \( \beta = 0.36, p = 0.002 \), correspondingly). Alternatively, the principal factors correlated to inter-atrial EMCD have been BMI, FBG, then tricuspid \( \dot{e}/a^- \) \( (\beta = 0.30, p = 0.006; \beta = 0.39, p = 0.001; \beta = 0.37, p = 0.009, \) correspondingly). No connection has been presented among age, sex and atrial EMCD. Correlation relationship analysis displayed a positive relation between inter-atrial EMD and P d \( (r = 0.432, p = 0.001) \) and positive correlation between LA-size \( (r = 0.430, p = 0.001) \) figure (3).

**Discussion**

In this research, the P-wave maximum and P-wave dispersion found to be increased significantly in DM contrasted to control. P-wave minimum was significant in control. The time of EMCD in mitral, septal and tricuspid annuli relative to LA diameter were highly significant in DM. Also, we were very importantly found that the inter-atrial, left intra-atrial and right intra-atrial electro-mechanical conduction delay were significantly prolonged in DM contrasted with control. These our findings were stated by many studies said that the change relating the minimal and maximal P-wave time on surface ECG, is an ECG sign that has been linked with intermittent conduction and tissue inhomogeneity of sinus stimulus reproduction(10). The association between the increment of inter-atrial and intra-atrial delay conduction had a prognostic effect by producing arrhythmia as paroxysmal atrial fibrillation (PAF) has been thoroughly acknowledged(11). Though atrial conduction phase is intensely suggestive of atrial electrical remodeling, TDI and 2 easy ECG markers for P-max. and P-wave dispersion (P d) may give statistics going on for elongation of the atrial conduction interval(12).

In the research PA lateral, PA septum and left atrial EMD have been increased significantly in DM and is directly related to the stage of blood sugar.

Tanaka and associates, 2019 said that left electromechanical atrial conduction time delay has been appreciably greater in DM than in controls (12).

This study was also showed that the following sample mean differences \( (E/A \text{ and } \dot{e}/a^- \text{ were significant in control group, IVRT and } E/\dot{e} \text{ was significant in diabetics}) \) in agreement with Saqar who said that DM is a hazardous autonomous feature that upsetting heart structure and function(13).

In our study, we examined LA diameter and index of LA volume and parameters of LV diastolic function. This research was showed that the interatrial EMCD had an important and significant correlation with the LA volume index. Checking that a decrease in \( \dot{e}/a^- \) of LV-associated DM can provide the prolongation of inter-atrial EMCD in DM than in controls, and was discovered to support our TDI results. The regression analysis in our study showed a frail association among FBG and inter-atrial and LAEMCD. This effect can boost AF sensitivity in this patient grouping and these
results in harmony with Mahfouz who concluded that there is an important correlation between AF and diastolic dysfunction, caused by boosted filling pressure and LA stretching in the nonexistence of structural cardiac disorder. According to Mahfouz (14), we located a bigger LA diameter for the DM than in the control group. The mechanical function of LA is a significant component of LV filling. LA displays as storage during systole, as a passage at the initiation of diastole and as a vigorous contractile chamber at the diastole ending (15). The LA function automatically enables the transition between the flow in the pulmonary circulation and the paroxysmal filling of the LV (15). Through diastole, LA is directly exposed to the LV pressure, that increases when the diastolic function of the LV is compromised (16). LAAEV and LAAEF were also considerably advanced in DM matched to the control for our research. Diastolic function calculated in TDI and conventional echocardiography that have been considerably further compromised in DM than in the control. The significant rise in LAAEV and LAAEF in this study suggests that compensatory LA contraction is important in the diastolic part. The significant relation between LAAEV and LAAEF and the factors that signify diastolic disorders support our suggestion. LAPEV significant mean difference was lower in diabetics in this study. In agreement with the former analyses, Gallen realized that with DM, the LA transmission turn into slow and the LA compliance decreases, signifying the manifestation of DM associated LA wall remodeling (17), also Thomas and associates displayed that DM is a notorious reason of atrial-ventricular conduction delay along with the augmented incidence of AF (18), so this study was showed direct association between atrial EMD and DM.

Conclusions

In diabetics, conduction times of the atrium by TDI and the dispersion of the P-wave by surface ECG were longer. Furthermore, the mechanical functions and volumes of the left atrium were affected by altering diastolic function in diabetics.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: None

Funding: Self-funding

References


Religious Character and Service Innovation toward the Improvement of Sustainable Quality of Primary Health Services in South Sulawesi

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Abstract

The World Health Organization (WHO) stated that accreditation is a method for ensuring quality of health services. The method was developed in Indonesia. Accreditation is a form of method to measure the quality of health center services. Malcolm Baldrige National Quality Award (MBNQA) model and The Model For Understanding Success in Quality (MUSIQ) that are developed in several countries, have not paid attention to the religious and service innovation aspects. This study was aimed to analyze the influence of religious character and service innovation toward the improvement of sustainable quality of primary health services in South Sulawesi. This research was a mixed method research. The qualitative data was obtained from 10 informants that the result was then examined by using content analysis. The samples for quantitative study were chosen through proposive stratified random sampling technique with Lame show formula to get 395 respondents.

From the result of qualitative research, it was found that religious characters have 10 indicators, namely discipline, presenting God in every activity, fair, patient, friendly, committed, tabliqh, fathanah, amanah and shiddiq. In addition, service innovation is composed of 6 indicators namely new activities/modifications, follow-up analysis, resource support, cross-sector collaboration, providing new brands and developing local wisdom.

Furthermore, from the result of quantitative research, it was found that there was a significant influence of religious character and service innovation toward the improvement of sustainable quality of primary health services by using Chi-Square test result which p value = 0.001 (p<0.05). Hence, it is recommended that community health service staff should apply religious character and service innovation to improve sustainable quality of primary health care.

Keywords: Religious character, innovation, service quality.

Introduction

Accreditation is a form of assessment or evaluation of the quality and feasibility of an institution conducted by an accreditation body. The World Health Organization (WHO) uses this system to evaluate the process of health services in improving the quality of services to serve patients. WHO expects all countries to have quality health services.¹

Moreover, accreditation is a process of evaluation and monitoring through measurement of compliance with standards, not an end result of quality. The Institute of Medicine (IOM) reported that the quality improvement approach is more results-based. Therefore, accreditation is considered as the end of quality check so that efforts to improve quality have not been sustainable.²

Malcolm Baldrige National Quality Award (MBNQA) and The Model for Understanding Success
in Quality (MUSIQ) are quality improvement concepts developed in many developed countries. One of the weaknesses is the lack of attention to aspects of religious character and service innovation. The success of the implementation is determined by multiple variables, and each of the variables is interconnected with each other. Community health center is still less than optimal in providing services to the community. This makes them prefer to get health services from clinic, hospital and other health facilities. In addition, the image and appearance of community health center far from government’s attention.

Religious characters that must be owned by community health center staff are discipline, fair, honest, clean, trustworthy, good at communicating, patient, friendly, committed and wise. Thus, the staff should be able to apply those religious characters in the workplace in order to improve the sustainable quality.

However, unsustainable quality of community health center services will result in low satisfaction of patients as well as a lack of trust. Therefore, efforts should be made to enhance the quality of community health center.

**Religious Character:** Religion, which is a particular system of belief, influences choices and behavior patterns of society. In fact, religion is a systematic culture that can create strong beliefs or values for its adherents.

Developing health care employees’ religious character will certainly have a positive impact on the ability to act in providing services to patients. This has been proven through several researches that the quality of Islamic-based service has a positive and significant impact on customer satisfaction. CARTER theory explains that there is a strong relationship between adherence to Islamic law and customer satisfaction. Cultural values, including customary norms, marriage values, loyalty values, and other values, are sacred for Indonesian people.

The application of religious character in giving services is considered to be very important for Indonesian people for they are inseparable from the aspect of religion in acting. Religious principles they hold are always applied in their daily activities.

**Service Innovation:** Innovation means creating changes or introducing new things. Innovating is transforming knowledge to be new products, processes and services, or can be said that it is the act of using something new. Innovation in public sector is more emphasized on the aspect of improvement resulted from innovation activities.

Innovation in giving service is aimed to make public services better and make it in accordance with plan. If innovation is only meant to adjust to the trend, it will not last forever. Thus, innovation must be sustainable so that it will change according to the needs and development of society.

Innovation in health services can lead to changes in better public health services. For institutions, it also will prove that they have a strong will to be better. However, creating service innovation is not easy. An organization that is able to see itself as a public servant would be able to create innovation that are difficult for themselves but are beneficial to society.

**Puskesmas (Community Health Center):** The Regulation of the Minister of Health (PMK) No. 75 Year 2014 regulated that Community Health Center is one of the places to provide first-level health service facilities that have the responsibility to provide health services to the community in the work area that has been designated for either one or several sub-districts.

In carrying out the function, puskesmas has the authority to make plans based on the analysis of existing health problems in community and services needed. Moreover, it also carries out advocacy and dissemination of health policies, communication, information, education and community empowerment in health sector, involves the community to identify and solve problems about health faced at every level of community development in collaboration with other sectors, carries out technical guidance to the network of services and community-based health efforts, enhances the competency of Human Resources (HR), monitors the implementation of development of health knowledge, and records, reports and evaluates on access, quality and coverage of health services as well as provides recommendations regarding public health issues, including support for early alert systems and responses in preventing disease.

**Quality of Health Services:** Quality, in this case, is the level of perfection of health services which on the one hand can satisfy the service users and other parties. The procedure of its implementation is in accordance with the code of ethics and the established standards. The quality
of community health center services is a series of health service activities that meet the needs of both individuals and communities carried out by professionals according to the standards and codes of ethics.4

The quality of health service has a function to provide an assessment that refers to the level of perfection in providing health services in accordance with what is needed and expected by whoever needs health services. The better the fulfillment of people health care needs, the better the quality obtained in health services.

Materials and Method

This study is a mixed method research, which is an approach to investigate an object by combining qualitative and quantitative researches in a study10 to obtain more comprehensive, valid, reliable, and objective data. The qualitative stage was carried out through focus group discussions (FGD) and in-depth interviews. The data were analyzed by means of content analysis, data reduction, and interpretation. The quantitative stage was done through cross sectional analytic of observational study observational study.

The populations of this study are members of the primary health care accreditation commission, accreditation surveyors, accreditation consultants, academics, religious leaders, community health center heads, quality control team, administration and management personnel that are responsible for the public and individual health from each community health center. Furthermore, the qualitative research was done by selecting 10 informants who have met the requirements, while the samples for the quantitative research were selected through proposive stratified random sampling technique based on Lame show formula to get 395 from 2,020 respondents.

Research Results

The qualitative research was done by conducting focus group discussions (FGD) and indepth interviews toward 10 informants. The informant defined religious character as follows.

“... discipline is a part of religious character, a strong discipline based on religious principles will develop a strong sense of awareness in improving sustainable quality ...” (SM, 62 years old)

“...religious character emphasizes more on the nature of prophethood; fatanah, amanah, siddiq, and tabligh. As well as clean, orderly, discipline, punctual, right on target, and appropriate in providing health services...” (MYY, 41 years old)

“...religious character includes prayer on time, present God in all activities, committed, and show equality in giving service to men and women ......” (GM, 48 years old). “...more discipline in doing worship, presenting God in all activities and sincerity are religious characters ...” (SR, 55 years old)

“.......... the most important part of religious character are discipline, honest, trustworthy, intelligent, present God in all activities, and friendly ...” (AB, 40 years old)

“..........religious character can be seen from sustainable service, honest, do not commit corruption, collusion and nepotism, smiles, greets others, and as what showed by the prophet, fatanah, trustworthy, siddiq and tabligh...” (AMS, 52 years old)

“.......... ... discipline, responsible, honest, committed, have strong empathy, friendly, smile, greet others, not gender biased, not differentiate male and female in giving services, not differentiate people based on race and religion, and pray before giving service ...... ..” (SP, 47 years old)

“... ... the characters had by individuals cannot be measured, such as patience, like to complain, not giving up, have high fighting spirit. As officers, they should be hard-working, discipline, istiqomah, concern on punishments and rewards, give services that are safe and do not differentiaite people based on their ethnicities, religions, capacity, being honest and responsible ...... ..” (RA, 52 years old)

Based on the result of the focus group discussion (FGD) on religious characters, the result can be seen in the following graph.
Furthermore, the informants also explained about service innovation as follows.

“... innovation is a follow-up to the results of the analysis of problems, changes in regulations, rules, or changes in technology. Innovation includes modification or new activities that are made by community health center. Innovation activities must also involve community participation …..” (RP, 52 years old)

“…… New activities or modification of activities are aimed at improving services or achievements. As well as people, money, method, materials, and machines (resources), and local wisdom ……… “(MYY, 41 years old)

“…… New activities or modification of activities, including making new terms that are attractive to the community, and also require a cross-sectoral role, and local wisdom of the community ………” (UM, 42 years old)

“…… The most important health service innovation includes brand, even though modification activities or new activities are carried out at the community health center... (AA, 42 years old)

Based on the result of the focus group discussions (FGD) and independent interview on innovation in health services, a scheme is derived and can be seen as follows.
Figure 2. Health Service Innovation Scheme

From the qualitative research using questionnaire containing 140 statements filled by 395 respondents that was then analyzed, the result is presented as follows.

1. The Effect of Religious Characters toward the Improvement of Sustainable Quality of Primary Health Services.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sustainable Quality Improvement</th>
<th>Total</th>
<th>Result of Statistic Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bad</td>
<td>Good</td>
<td>n</td>
</tr>
<tr>
<td>Religious Characters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td>155</td>
<td>80.7</td>
<td>37</td>
</tr>
<tr>
<td>Good</td>
<td>32</td>
<td>15.8</td>
<td>171</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2019
The improvement of the continuous quality of religious characters variable with bad category is held by 37 people (19.3%) and good category is held by 171 people (84.2%). The results of the data analysis by using Chi-square test obtained p value = 0.001 (p <0.05).

2. The Effect of Service Innovation toward the Improvement of Continuing Quality of Primary Health Services.

Table 2: The Analysis Result of Service Innovation toward the Improvement of Sustainable Quality of Primary Health Services in South Sulawesi

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sustainable Quality Improvement</th>
<th>Total</th>
<th>Result of Statistic Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bad</td>
<td>Good</td>
<td>n</td>
</tr>
<tr>
<td>Service Innovation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bad</td>
<td>120</td>
<td>31</td>
<td>151</td>
</tr>
<tr>
<td>Good</td>
<td>67</td>
<td>177</td>
<td>244</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2019

According to the table above, the service innovation variable toward the improvement of sustainable quality that are categorized as bad is held by 120 people (79.5%) and that is categorized as good is held by 67 people (27.5%). In addition, the innovation service toward the improvement of sustainable quality that is categorized as good is held by 31 people (20.5%) while the one categorized as bad is held by 177 people (72.5%). The results data analysis by using Chi-square test obtained p value = 0.001 (p <0.05).

Discussion

According to the content analysis, data reduction, and interpretation of religious characters, there are 10 indicators, namely discipline, presenting God in every activity, fair, patient, friendly, committed, tabligh, fathanah, amanah and shiddiq. Moreover, there are 6 indicators for health service innovation, namely new activities/modifications, follow-up analysis, resource support, cross-sector collaboration, providing new brands and developing local wisdom.

The religious characters built in providing services can improve the sustainable quality of primary health care. Religious characters that must be owned by community health center officers are discipline, involve God in all activities, serve patients well (not gender, religious and racial biased, not distinguish patients’ status), being friendly to anyone, and being fathanah (wise), amanah (trustworthy), siddiq (honest), and tabligh (communicative).

The results of the analysis of the service innovation variable showed that there were 72.5% of the respondents, stated that service innovation has good category toward the improvement of sustainable quality, the Chi Square test result obtained a p value of 0.001 (p<0.05). This means that service innovation significantly influencesthe improvement of sustainable quality of primary health services in South Sulawesi.

The service innovation of community health service from the analysis of problems, changes in regulations, changes in service guidelines or changes in technology will certainly be able to improve services. Service innovation in the form of new activity/modification, follow-up of problem analysis result, or development of local wisdom must get the support from resources and cross-sectional role. Those kinds of service innovations are needed including making new brands to increase community motivation and interest.
Conclusion

Religious characters and service innovation have significant influence toward the improvement of sustainable quality of primary health services in South Sulawesi. Therefore, it is recommended that every officer in the community health center should apply religious characters and innovation in providing services to the community to improve the sustainable quality.

Acknowledgment:

Competing Interests: The researchers declare that they do not have any competing interest.

Financial Support: The funding of this research was carried out independently.

Ethical Clearance: The ethical approval of this research was based on the letter Number: 4326/UN4.14.8/TP.02.02/2019 Faculty of Public Health, Hasanuddin University, Makassar Indonesia.

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Correlation of Glycated Haemoglobin with Netrin-1 and High Sensitive C-Reactive Protein in Type 2 Diabetes Mellitus Patients

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Abstract

Diabetes mellitus is a group of metabolic disease with the characteristic of hyperglycemia that occurs due to abnormal insulin secretion, insulin action or both. Low level inflammation plays a role in the mechanism of type 2 DM. Netrin-1 is a laminin protein group that has anti-inflammatory properties. Netrin-1 is a new potential biomarker for diagnosing type 2 DM and its complications. High sensitive C-reactive protein is an acute phase protein produced by the liver in response to proinflammatory cytokines. Glycated haemoglobin test is a test recommended by the American Diabetes Association as a marker for diagnosis and predictor of the development of DM complications. The purpose of this study was to determine the correlation between glycated haemoglobin with netrin-1 and high sensitive C-reactive protein in patients with type 2 DM.

This cross sectional study used type 2 DM patients as a sample. Fifty two type 2 DM patients participated in this study. The sample consisted of 21 samples of controlled type 2 DM and 31 samples of uncontrolled type 2 DM. The glycated haemoglobin was measured using immunoturbidimetry method, netrin-1 was measured using the ELISA method and hsCRP by immunoturbidimetry method. Data were analyzed statistically with the Mann Whitney and Spearman test.

The results showed that netrin-1 in the uncontrolled type 2 DM group was higher than netrin-1 in the controlled type 2 DM group but there was not statistically significant (p> 0.05). High sensitive C-reactive protein in the uncontrolled type 2 DM group was higher than in the controlled type 2 DM group (p< 0.05). Glycated haemoglobin does not correlate with netrin-1 (p>0.05). Glycated haemoglobin was positively correlated with hsCRP with moderate correlation strength (p < 0.01, r = 0.418). Netrin-1 did not correlate with hsCRP (p > 0.05). It was concluded that netrin-1 and hsCRP were higher in uncontrolled DM. The higher glycated haemoglobin, the higher hsCRP too.

**Keywords:** DM type 2, glycated haemoglobin, netrin-1, hsCRP.

Introduction

Diabetes mellitus (DM) is a heterogeneous metabolic disorder characterized by the presence of hyperglycemia that occurs due to impairment of insulin secretion, insulin action or both.¹,² Chronic hyperglycemia can cause damage to many of the body’s organs, leading to disabling and life threatening health complications such as cardiovascular diseases, neuropathy, nephropathy and retinopathy.³

It was estimated that in 2019 there were 463 milion people have diabetes and this number is projected to reach 578 million by 2030 and 700 million by 2045. Diabetes also estimated to be associated with 11.3% of global deaths from all causes among adult people.³

Glycated haemoglobin or HbA1c defined as haemoglobin which is irreversibly glycated at one or both N-terminal valines of the beta chains.⁴ Glycated haemoglobin formed in a non
enzymatic glycation pathway by hemoglobin exposure to plasma glucose. Once a haemoglobin molecule is glycated, it continues to remain in the red blood cell for the rest of its life span. Glycated haemoglobin has been the mostly used and accepted test for monitoring the glycaemic control in individuals with diabetes. Glycated haemoglobin test is recommended by the American Diabetes Association as a marker for diagnosis and predictor of the development of DM complications. Several studies have shown correlation of HbA1c with microvascular and macrovascular complications.

Low grade inflammation might play a role in the development and complications of type 2 DM. Chronic hyperglycaemia induces oxidative stress and chronic inflammatory state. Chronic hyperglycaemia stimulates the release of various inflammatory cytokines such as IL-6 and TNF α and induces the secretion of acute phase reactants by the liver. C-reactive protein is an acute-phase protein, act as an inflammatory marker produced and released by the liver under the stimulation of cytokines. C-Reactive Protein measured by highly sensitive assays (hsCRP) is a very sensitive marker of inflammatory activity.

Netrin-1 is a laminin group protein encoded by the NTN1 gene which located on 17p13.1 chromosome. Netrin-1 is expressed by the central nervous system, endothelial cells of blood vessels, pancreas, liver, lymph, lungs, intestines and kidneys, which can act as an anti-inflammatory. Netrin-1 can be measured using plasma samples, serum or urine by using enzyme-linked immunosorbent assay (ELISA).

Chronic inflammation plays role in the pathogenesis of type 2 DM. Glycated haemoglobin test is recommended by the American Diabetes Association as a marker for diagnosis and predictor of the development of DM complications. C-Reactive Protein is an inflammatory protein produced by the liver and have correlation with HbA1c in many research. Netrin-1 is a protein that has an anti-inflammatory actions. Different animal model and human subjects that were induced have diabetes alone or along with various microvascular or macrovascular complications showed that the level of netrin is altered in various diseases conditions. The level of netrin in a diabetes model displayed an inconsistent expression in different clinical studies so we make a study to determine the correlation of glycated haemoglobin with netrin-1 and hsCRP in type 2 DM patients.

**Materials and Method**

This cross-sectional study was performed to analyze the correlation between glycated haemoglobin with netrin-1 and hsCRP in type 2 DM patients at Dr. Wahidin Sudirohusodo General Hospital and Rumah Sakit Unhas in Makassar. This research was conducted during June 2020. The samples of this study were all adult type 2 DM patients diagnosed by Internists based on American Diabetes Association or Perkumpulan Endokrinologi Indonesia, having data for fasting blood glucose, HbA1c, total cholesterol, HDL, LDL, triglycerides and creatinine. Patients with infection, anemia, polycythemia, thalassemia, received a whole blood transfusion or packed red cell within the last 3 months and have a history of heart disease and liver disorder were excluded. Informed consent were obtained from all participants.

All samples were examined for hsCRP level using Roche Cobas e 411 automatic chemical analysis at Parahita Laboratory and netrin-1 level by the Enzyme Linked Immunosorbant Assay (ELISA) method in the Laboratory Research Unit of Rumah Sakit Unhas, Makassar.

Data were statistically analyzed using Kolmogorov-Smirnov normalization test. Mann Whitney test was performed to compare netrin-1 and hsCRP level in controlled and uncontrolled type 2 DM patients. Spearman correlation test was performed to assess the correlation between HbA1c and netrin-1, HbA1c and hsCRP and between netrin-1 and hsCRP. The results were significant with a p value at <0.05.
Results

Table 1. Sample characteristics

<table>
<thead>
<tr>
<th>Variables</th>
<th>n (%)</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>36 (69.20)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>16 (30.80)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (Year)</td>
<td></td>
<td>35</td>
<td>84</td>
<td>59.23 ± 9.44</td>
</tr>
<tr>
<td>HbA1c (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 7</td>
<td>21 (40.38)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;7</td>
<td>31 (59.62)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Netrin-1 (pg/dL)</td>
<td></td>
<td>183.6</td>
<td>2241.4</td>
<td>787.30 ± 405.34</td>
</tr>
<tr>
<td>hsCRP (mg/dL)</td>
<td></td>
<td>0.03</td>
<td>2.64</td>
<td>0.38 ± 0.46</td>
</tr>
</tbody>
</table>

The characteristics of this study samples can be seen in table 1. Total of 52 patients participated in this study. The patients age were between 35-84 years with an average of 59.2±9.4 years. The HbA1c levels were between 5.1-12.2% with an average of 7.87%. The sample consisted of 21 (40.38 %) type 2 DM controlled group and 31 (59.6%) uncontrolled type 2 DM group. The lowest and highest netrin-1 level were 183.6 pg/dL and 2241.4 pg/dL, respectively. The hsCRP level was between 0.03-2.64 mg/dL with average of 0.38 mg/dL.

Table 2. Netrin and hsCRP Level Based on Group

<table>
<thead>
<tr>
<th>Variabel</th>
<th>Controlled Type 2 DM (n=21) Mean±SD</th>
<th>Uncontrolled Type 2 DM (n=31) Mean±SD</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netrin-1 (pg/mL)</td>
<td>759,22±387,20</td>
<td>806,32 ± 422,42</td>
<td>0,695</td>
</tr>
<tr>
<td>hsCRP (mg/dL)</td>
<td>0,22 ± 0,28</td>
<td>0,48 ± 0,53</td>
<td>0,010*</td>
</tr>
</tbody>
</table>

*Mann Whitney

Table 2 showed netrin-1 and hsCRP level based on controlled and uncontrolled DM groups. Netrin-1 was higher in patients with uncontrolled DM (806.32±422.42) than patients in controlled DM (759.22±387.20) but not statistically significant (p>0.05). hsCRP level was found significantly higher in uncontrolled DM group than in controlled DM group, which was 0.48 compared to 0.22 (p <0.05).

Table 3. Correlation HbA1c with Netrin-1

<table>
<thead>
<tr>
<th>Netrin-1 (pg/mL)</th>
<th>n</th>
<th>r</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1C (%)</td>
<td>52</td>
<td>0.136</td>
<td>&gt;0.05</td>
</tr>
</tbody>
</table>

*Source: Primary data
*Spearman Test

Table 3 shows that HbA1c does not have a significant statistically correlation with netrin-1.

Table 4. Correlation HbA1c With hsCRP

<table>
<thead>
<tr>
<th>hsCRP (mg/dL)</th>
<th>n</th>
<th>r</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1C (%)</td>
<td>52</td>
<td>0.418</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

*Source: Primary data, *Spearman Test

Table 4 showed a significant correlation between HbA1c and hsCRP with moderate correlation strengths. This shows that the higher the HbA1c, the higher the hsCRP.

Table 5. Correlation Netrin-1 with hsCRP

<table>
<thead>
<tr>
<th>hsCRP (mg/dL)</th>
<th>n</th>
<th>r</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netrin-1 (pg/mL)</td>
<td>52</td>
<td>0.083</td>
<td>&gt;0.05</td>
</tr>
</tbody>
</table>

*Source: Primary data, *Spearman Test
Table 5 showed correlation between netrin-1 levels and hsCRP in type 2 DM patients. Spearman test showed there were no significant correlation between netrin-1 and HbA1c.

Discussion

This study was conducted on 52 type 2 DM patients aged between 38-84 years old with mean of 59.2 ± 9.4 years. This result is in line with Indonesia Riskesdas 2018, which gets the proportion of DM increases with age and the highest is found in the 55-64 years age group.11 The sample consist of 35 male patients (66.7%) and 17 female patients (33.7%). International Diabetes Federation report that estimated prevalence of diabetes in women is slightly lower than in men.3

Netrin-1 level in uncontrolled type 2 DM group was higher than in controlled type 2 DM group although this results were not statistically significant. This research is in line with research conducted by Yim who found that netrin-1 in DM group was higher than IFG group and healthy group.12 Netrin has anti inflammatory action.12 Elevated serum netrin-1 is probably attributable to a compensatory response of uncontrolled DM.12

There was no significant correlation found between HbA1c and netrin-1 in this study. This result in line with research conducted by Liu in 2018 but contrass to research conducted by Ay, 2016 and Liu, 2016.9,13,14 Ay get a positive correlation between netrin-1 and HbA1c while Liu get a negative correlation.9,13,14 A reason that distinguish various results of these study might be the differences of patient characteristics. Yim and Liu recruited newly diagnosed type 2 DM patients who had never received anti-diabetic drug therapy.9,12 The sample of this research were newly diagnosed type 2 DM patients and those who are already taking anti diabetic drugs.

Moderate positive correlation strength was observed between HbA1c and hsCRP levels in this study. This result in line with the previous study before. In hyperglycemia state, concentration of advanced glycation end products is elevated and has been shown to activate macrophages, increased oxidative stress and upregulated synthesis of interleukin-1 (IL-1), IL-6 and tumour necrosis factor (TNF-α) resulting in production of CRP.15 These pro-inflammatory cytokines are engaged with different metabolic pathways applicable to insulin resistance, including insulin direction, receptive oxygen species, lipoprotein lipase activity and adipocyte function.16

Netrin-1 did not correlate with hsCRP in this study. The results of this study are in line with research conducted by Yim et al. Yim stated that netrin-1 and CRP were higher in type 2 DM group and IFG group compared to normal group but netrin-1 did not correlate with CRP.12 Netrin is a protein secreted by the endothelium which has anti-inflammatory effects while hsCRP is a protein produced by the liver in response to pro-inflammatory cytokine. Netrin will increase or decrease to suppress inflammation. Liu et al reported that higher levels of albumin trigger production of netrin-1 from proximal tubular epithelial cells via extracellular signal regulated kinase (ERK) and Akt kinase pathways.13 Patientsnephropathy diabetic with increasing albuminuria had higher systolic blood pressure, duration of diabetes, blood urea nitrogen and serum creatinin.13 We suggested that despite of pro-inflammatory cytokines, there were many factors could affect correlation between hsCRP and netrin-1 suchas albumin, duration of DM and it’s therapy.

This study has several limitations. We used heterogeneous samples, did not take healthy controls and did not analyze IL-1, IL-6 and TNF-α as pro-inflammatory cytokines.

Conclusion and Suggestion

There were no statistically significant correlation found between glycated haemoglobin and netrin-1 and between netrin-1 and hsCRP in type 2 DM patients. Glycated haemoglobin was positively correlated with hsCRP with moderate correlation strength. Further randomized prospective studies with homogeneous larger samples and classify samples into control group (healthy people), controlled and uncontrolled diabetic patients are required to support our findings.

Ethical Clearance: Obtained from Medical faculty ethical committee

Source of Funding: Self

Conflict of Interest: None

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Awareness Mental Health During Pregnancy in Practice Midwife of Bogor, Jawa Barat

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¹Program Doktoral, Medicine Faculty, Universitas Andalas; ²Health Science Faculty, Universitas Nasional

Abstract

Mental health problems in pregnancy still lack the attention of midwives, which is identified in the low mental health checks of pregnant women during antenatal care. A subsequent research was conducted by Idaiani in Jakarta and Bogor regions 2018 regarding the incidence of Perinatal Depression that reached 18.6% in Bogor region.

This research was a qualitative research and was conducted January 2019 in Independent Midwifery Practice in Bogor. The subjects of this research were The interview was conducted with 15 informants, they were one person from the ministry of health, coordinating midwives, chairmen of Indonesian midwives’ branch associations in Bogor with total of 5 midwives who provided services in independent midwifery practice and as a key is 3 woman pregnant and three families of pregnant women, data were analyzed by using triangulation analysis.

Based on result of the research, The Construction Model Mental Health on Mothers during pregnancy in Independent Midwifery Practice is very important and needs attention. Pregnancy is still considered as a physical change that needs to be intervened because it is easier to be handled and detected. Maternal examination during pregnancy is carried out by Midwives in the implementation of mental health checks during pregnancy for pregnant women and this role has not been carried out optimally.

This research suggests conducting socialization with midwives as well as across related sectors to get political support in carrying out activities in health facilities and independent practice midwives.

Keywords: Pregnancy, Mental Health, Nurul’s Model.

Introduction

Mental health problems in pregnancy still lack the attention of midwives, which is identified in the low mental health checks of pregnant women during antenatal care. Mental illness during pregnancy is a public health problem that should be focused on seriously. 10-20% women in the world experienced mental health problem during the first stage of labor. The common mental illness experienced by women include antenatal and postnatal depression, obsessive-compulsive, post-trauma stress, and post-partum psychosis. The prevalence of mental illness or mental health problem during pregnancy in low-income countries reached 15.6%. One of five women experienced mental health issues during pregnancy such as depression, acute anxiety and fear towards labor, and mild to moderate emotional disorders. Depression and anxiety are common during pregnancy. The prevalence rates of 6% and 17% have been reported for major and minor depression, respectively. Meanwhile, the prevalence rate of anxiety symptom is reported for 23% due to change in appearance which affects the self-efficacy, and 15% for anxiety during antenatal period due to the feeling of unworthiness caused by pregnancy.
According to World Health Organization (WHO), around 10% of pregnant women and 15% of post-partum women experienced mental illness, especially depression. The prevalence rate is even higher in developing countries that reach 15.6% during the pregnancy and 19.8% towards the labor.

Some studies focused on decreasing the effect of pregnancy to mental health – psychology, stress and depression, knowledge, empowerment, and self-efficacy by improving the quality of pregnancy examination with antenatal care. Health workers are responsible to provide education on psychosocial condition of pregnancy to pregnant women. Besides, additional care during pregnancy should also be provided by health workers (obstetric, midwife, and nurse). This attempt is needed to foster empathy among the health workers and encourage pregnant women to check their condition; which in the long term will decrease the adverse psychological condition during the pregnancy, after pregnancy, and child care.

Mental health problem and other issues during pregnancy can be dangerous for the pregnant women and their children. The children might experience premature birth, low birth weight, and others. In addition, social stigma, low self-efficacy, and negative perception will encourage pregnant women to visit the health facilities.

The prevalence rate of depression during pregnancy in Indonesia has reached 22.4% that may increase the morbidity and mortality rates of mother and children during the pregnancy and postpartum periods. Mental health problems caused adverse effects to the pregnancy and the baby.

**Material and Method**

This research was a qualitative research with explorative primary data approach. The interview was conducted with 15 informants, they were one person from the ministry of health, coordinating midwives, chairmen of Indonesian midwives’ branch associations in Bogor with total of 5 midwives who provided services in independent midwifery practice and as a key is 3 womant pregnant and three families of pregnant women, informant with under review theme and was an understanding of mental health in pregnant women and the members of Indonesian midwives’ branch associations to reveal the cause-effect finding. The research time was around January in 2019.

The data analysis was carried out by triangulation approach: source analysis and thematic analysis.

**Results**

**Perception on Mental Health during Pregnancy**

The definition of Information on Mental Health of Pregnant Women

Mental health during pregnancy regarding mental health of midwife informants is a state of mental disorders/illness in pregnant women such as depression, stress, anxiety “Mental health of pregnant women is a mental condition of pregnant women who are disturbed, mental illness usually because pregnant does not have a husband, pregnant because of rape victims so that his soul is disturbed” (Inf 1)

“Mental Health Pregnant women are the ones who know mental health. There are pregnant women who are stressed because they could be left by their husbands, or they could be due to unintended pregnancy. If there is only a general program, if there is no examination tool at the midwifery independent practice, they words are not understandable and they like to laugh, just take them to the general practitioner. For the examination of pregnant women, I used the standard, which was 10 T, as far as I know, there is no psychiatric check for pregnant women. Obstacles do not exist if there is a new expression and we have to consult a general practitioner ”(Inf 2)

“Mental health is a healthy condition not just a body but it must also be healthy inside but it is unclear whether it has become a standard in pregnancy examinations and there is no program as far as I know” (Informant 3).

“Mental health is the definition in the law of pregnant women undergoing physical, mental and social changes, to get healthy children the mother must be physically, mentally and socially healthy, then midwives need to oversee the health of these women, they are in professional standards, midwives only check the stomach, then help the childbirth. Modules do not exist yet, but there were many references, so when preparing the health of women to become mothers, it must be include the physical, mental and social health. Many factors influence among others, like, social, cultural, political, economic, policy factors. There are no obstacles, one of which is due to the limited understanding and ability of midwives in carrying out
their role of being a reliable and competent midwife, due to the lack of formation in the education process, so that graduates become midwives don’t know what to do. The lack of public awareness, about the importance of preparing to give birth to a future generation of quality, there is no pregnancy planning. Therefore midwifery care must be comprehensive and sustainable, respecting the uniqueness of women.

**Table 1. In-depth Interviews about the Definition of Mental health on Pregnant Women**

<table>
<thead>
<tr>
<th>Thematic Answers</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disruptive mental illness during pregnancy (inf 1).</td>
<td>The mental health of pregnant women is a state of being prosperous and productive during pregnancy.</td>
</tr>
<tr>
<td>pregnant women who received their pregnancy (inf 3).</td>
<td></td>
</tr>
<tr>
<td>To have a healthy child, the mother must be physically, mentally and socially healthy, so midwives need to monitor women’s health (inf 4).</td>
<td></td>
</tr>
</tbody>
</table>

Based on the document review, the definition of mental health is a condition of well-being in which a person realizes his own potential, she can deal with stress normally in her life, work productively and profitably, and is able to contribute to herself or his community.14

The results of in-depth interviews and document review of the definition of Mental Health for Pregnant Women can be seen in the following table:

**Table 2. Triangulation of Informants on the Definition of Maternal Mental Health**

<table>
<thead>
<tr>
<th>Thematic</th>
<th>Interview</th>
<th>Document Review</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition of Mental Health on Pregnant Women</td>
<td>Mental Health for Pregnant Women is based on a document review, the definition of Mental health is a condition of well-being in which a person realizes her own potential, can deal with stress normally in her life, work productively and profitably, and is able to contribute to herself or her community.</td>
<td>Mental health problems have not been recorded in the documentation of midwifery care for all pregnant women</td>
<td>Based on the results of interviews and document review, midwives have not been able to explain the definition of Mental Health for Pregnant Women</td>
</tr>
</tbody>
</table>

**Factors Affecting Mental Health**

The factors that affect mental health of pregnant women according to several informants are as follows:

“.......... Mental health will be caused by many things, especially if a pregnant woman knows about her pregnancy, preparation and support from her husband, from her family as well as her surroundings. Feeling supported by husband greatly improves the mental health of pregnant women, however, the formation of a sense of comfort and peace in pregnant women will be formed from the people and the environment closest to the pregnant mother. However, the condition of pregnant women, such as being irritable, disrespected and feeling unsure, can also affect the mental health of pregnant women, for this thing, it is necessary to support and strengthen health workers, such as midwife, whose place are often used by pregnant women to check their pregnancy ... (Informant 1)

“.......... The mental health of pregnant women, on average, is caused by their husband or spouse. Many pregnant women are stressed because of the lack of support from their husbands, but now it cannot be denied that the economic situation is rather difficult so pregnant women are needed to be strengthened so that they are not spoiled, they must be given education by midwives so that they are strong and can respect their life cycle, their nature and confidence with their abilities. (inf 12).

“........ Mental health in pregnant women sometimes becomes stressful because they already have many children, the difficult in economic problems, husbands rarely stay home, disturbances or illnesses during pregnancy, lack of information from midwives about pregnancy, unplanned pregnancy, unintended pregnancy, .... (inf 6)
Table 3. In-depth Interview Factors affecting mental health

<table>
<thead>
<tr>
<th>Thematic</th>
<th>Answers</th>
<th>Conclusion</th>
</tr>
</thead>
</table>
| Factors affecting mental health of pregnant women | – Knowledge about pregnancy, social support from both husband and family, the role of health workers, especially midwives, the ability of pregnant women ... (inf 1)  
– Self-readiness of pregnant women, comorbidity, husband’s support, the role of a midwife ... (inf. 16) | Mental health factors for pregnant women are social support, especially midwives support such as Self Esteem and Self Efficacy. |

Based on a document review, the factors that influence mental health are social support, self-esteem, and self-efficacy in pregnant women related to mental health.

Table 4. Informants of Triangulation about factors that affect the mental health on pregnant women

<table>
<thead>
<tr>
<th>Thematic</th>
<th>Interview</th>
<th>Document Review</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factors affecting Mental Health of Pregnant Women</td>
<td>Factors affecting mental health of pregnant women are support from husbands</td>
<td>Factors affecting the Mental Health of Pregnant Women have not been documented</td>
<td>Based on the results of interviews and document review, factors affecting the mental health of pregnant women, social support, Self Esteem and Self-efficacy</td>
</tr>
</tbody>
</table>

Programs and Barriers to Maternal Mental Health:

Maternal Mental Health Program: Mental Health Program for pregnant women according to several informants; 1 Midwife, 1 midwifery coordinator, 1 Head of IBI, Head of Health Promotion of the Health Service and the Ministry of Health’s Directorate of Mental Health, are programs for handling cases of mental disorders or mental disorders in pregnant women. The following is an excerpt from the informant’s statement:

“...... The mental health program for pregnant women is a program that has been around since 2018 with MITO, this means that midwives already have a legal law so they must detect the extent of the mental health of pregnant women. This activity is currently being implemented in East Jakarta, and has not been socialized to the Regional Level Implementers. This program has not been evaluated even though this program has been launched since 2018 ......, (Informant (1 Directorate of Mental Health, Ministry of Health)

“...... A mental health program for pregnant women in particular does not yet exist, but in general, a general mental health program for anyone has been conducted in every Public Health Centre, mental health is important for pregnant women so that pregnant women are relax in facing their pregnancy and It should have been included in the service when a pregnancy check was carried out. Midwives as the first person and staff that pregnant women always meet must be able to carry out this mental health check, but they doubt pregnant women can go to a doctor ... (Informant (2. Head of Health Promotion, Bogor District)

“...... Mental health programs have been carried out by midwives such as Post Partum Blues. And if for pregnant women with mental disorders Schizophrenic or mental illness does not yet exist, it will only begin to be planned at the Ministry of Health and there has not been any implementation but competent midwives have to be able to identify for example the Post Partum Blues. The Ministry of Health will certainly work together with psychiatry (associations) to be able to discuss this mental health so that it does not become a danger to both mother and the fetus, also for all health workers associated with pregnant women service providers. And this will be comprehensive so that midwives and health workers must be able to communicate with pregnant women and their families including husbands ......... (Informant (3. Head of IBI) “

“...... Mental Health Program has not provided the program yet, even during the pregnancy checkup was 10 T and had not started yet for the mental health check. There are only those for Baby Blues, Post Partum Depression but there were not much that have been detected which are only checked in the Kf 1 Kf 2 Kf3 standard, usually in physical conditions such as dizziness due to low HB, breast milk production, complaints of Trobophlebitis, indeed mental health is sometimes neglected so midwives do not pay attention to this. For
mental health programs, it does not have to be specific but must be included in the examination of midwives for pregnant, childbirth and postpartum mothers ... Informants (4. BIKOR)

............ The mental health program for pregnant women does not exist, in pregnancy examinations there is also no mental health, it is usual to check for pregnancy according to the standard 10 T and must be carried out by midwives in pregnancy examinations that have become standard. If I get information about mental health, of course I will ask the head of IBI and the closest midwife, but I have never heard information about mental health ...

(Informant (7. Practical Midwife).

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<tr>
<th>Thematic</th>
<th>Answers</th>
<th>Conclusion</th>
</tr>
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</table>
| Mental Health Program on Pregnant Woman | – There has been a mental health program but it has not been socialized (inf 1)  
– There has not been any mental health programs which has a specialty in antenatal care for Bogor Regency (inf 2)  
– Here has not been a mental health program but it was already included in a comprehensive midwifery examination in midwifery care (inf 3) “  
– There has not been any special mental health program for pregnant women but if someone is stressed, the way she talks in not understandable, we just take her to a general practitioner and still use 10 T (Inf 4)  
– There has not been any specific program on mental health, as a reference for examinations for pregnant women, we are still using the ANC 10 T standard (inf 5) | The mental health program for pregnant women has already existed but has not been socialized to primary facilities. |

Based on a document review, mental health programs are special activities that must be carried out for pregnant women related to mental health.

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<tbody>
<tr>
<td>Mental Health Program on Pregnant Women</td>
<td>The mental health program for pregnant women has already existed but has not been socialized to the primary facilities.</td>
<td>The Maternal Mental Health Program has not been provided for all pregnant women.</td>
<td>Based on the results of interviews and document review, the Mental Health Program for pregnant women has already existed but has not been socialized to the Primary facilities.</td>
</tr>
</tbody>
</table>

**Barriers to Mental Health Screening:** Obstacles in the implementation of mental health examinations and management are all attributes that do not support health examinations and promotion, such as the absence of operating procedures standard, there is no law so that the authority of midwives as examiners and mental health implementers is not implemented properly. The following data are the results of in-depth interviews with informants.

“................. there should be no obstacles because there is already a module for midwives on how to train pregnant women to become Tough and Optimistic Mothers, equipped with videos and props in pregnant women class. However, there is still no operating procedure standard for the competence of midwives in mental health examinations. However, midwives should still be able to invite and train mothers to make MITO. It is hoped that the knowledge of midwives related to mental health needs to be improved, because it must be comprehensive, so it is necessary to increase the knowledge of midwives to know about maternal mental health during pregnancy ..... “Inf 1

“...................... There are already SOP on the implementation of classes for pregnant women, but specifically regarding the mental health of pregnant women in independent midwife practices, there is no formulated about mental health so that there is an emphasis in the examination of pregnant women the importance of mental health and we will immediately formulate it with the Ministry of Health. There is no module book yet and it could be an obstacle but in fact the funds have not arrived to reproduce ... ”inf 2
“........................ Standard Operating Procedure for Mental Health Examination is not yet in the standard of examination for pregnant women, but it is only in the class of pregnant women, it sometimes mentioned about how pregnant women are still can have sexual with her husband, have jokes and look harmonious ....... inf 4

Midwives’ knowledge about mental health

Difficult in Detecting Risk factors for KSPR, PASS, EDPS on pregnant women: Pregnancy needs to be managed properly, pregnancy as a physiological process can become pathological if it is not managed properly. The difficulty of careful management of pregnant women by health workers can reduce the delay in recognizing cases as a factor of delay.

Based on the document review, the difficulty of detection of risk factors for KSPR, PASS, EDPS is an important tool but they are difficult to apply during pregnancy examinations.

Discussion

Results of this study shows that public perception on mental health is still limited to mental disturbances, meanwhile it is defined as the state of well-being and productive. KIA BOOK has contained the pictures that illustrate the symptoms of mental problems. However, it is not yet perceived the concept of mental health as the state of well-being and productive during pregnancy.

Pregnant women around the world according to the Word Health Organization say that around 10% of pregnant women and 15% of women who have just given birth experience mental problems, especially depression. In developing countries this is even higher, namely 15.6% during pregnancy and 19.8% after childbirth.

this shows the need for knowledge both from pregnant women and from midwives as a place to pit pregnant women.

Besides increasing the knowledge of pregnant women by parents there is also the need for additional care in pregnancy by health workers (obstetricians, midwives, doctors and nurses). This effort is expected to be more empathetic so that young pregnant women want to come to health workers and can reduce the adverse effects psychologically during pregnancy both the acceptance of pregnancy and parenting at the time after giving birth to a baby.

Pregnancy is accompanied by mental problems and other problems that can endanger themselves and the child they are born with. Dangers for children born such as premature birth, low birth weight, etc. Besides that, the stigma is not good in the community, feeling themselves unable, low self-efficacy, and negative perceptions will affect the mother to come to a health facility.

A program to handle maternal and child health problems already exists, but the handling is prioritized (emphasized) on physical health, compared to mental health aspects that are often ignored in low and middle income countries including Indonesia (Atif, Lovell and Rahman, 2015). This is in line with the results of research which states that the mental health of mothers during pregnancy is a public health problem that tends to be ignored. Yet when referring to the World Health Organization (WHO) the definition of health is stated to be a complete state of physical, mental and social well-being and not just the absence of disease or weakness.

The definition of health combines a spiritual dimension, which in turn, ensures a holistic approach in providing mental health care. Comprehensive care is to meet not only the physical needs of patients but also their mental, social and emotional needs. Explained further, despite adopting/using the philosophy of holistic care, perinatal mental health problems often remain unnoticed/diagnosis is ignored, mothers with mental health problems often do not communicate with health workers and no further action is taken in midwifery authority.

One of the main obstacles in improving mental health services in first-level of health facilities is the low number of trained health workers in providing mental health care (for mothers) (Saraceno et al., 2007). The assessment of mental health training needs for midwives, showed a lack of training on mental health issues related to pregnancy and childbirth (Simkhada et al., 2016). The results of this study indicated that only about 30% of midwives took adequate action.

The integrative review conducted by Bayrampour et al. (2018) stated that the low management/actions taken by midwives related to mental health are influenced by two main aspects, they are; obstacles from health workers and obstacles from the system. Internal obstacles from health workers include lack of training,
lack of clarity on the scope of practice and limited time for examinations (ANC). Whereas barriers in the aspect of system consisting of unclear pathways, services that are not connected to each other, lack of local guidelines/policies, unclear continuity of services, procedures, clinical support, supervision and accessible educational resources, lack of availability of referral resources, complex bureaucracy and challenges in expanding the scope of practice.

In order to improve mental health services for pregnant women, it is important to develop community mental health services, including appropriate training and supervision (Saraceno et al., 2007). Training, hiring and supporting midwives are essential to help the improvement of mental health service skills (Ghebrehiwet and Barrett, 2007).

This training focused on promoting mental health as a part of everyone’s life and building skills to recognize mental health problems in pregnant women and new mothers (Hodgkinson et al., 2017). The problems related to the skills of midwives which are the subject of training include the following; (1) problems related to mental health training; (2) public attitudes; and (3) support for women. Training covers the benefits and limitations of training interventions; community attitudes lead to stigma and gender differences associated with mental health problems.

Conclusion

Based on the document review, the definition of mental health is a condition of well-being in which a person realizes his own potential, can deal with stress normally in his life, work productively, and is able to contribute to himself or his community.¹

The standard for pregnancy health care should be comprehensive. Therefore, deep understanding on pregnant women mental health is needed to construct high-quality health care for pregnant women to allow optimal preparation.

Ethical Clearance: Taken from University ethical committee.

Source of Funding: Self

Conflict of Interest: Nil

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Decentralization Implementation of HIV/AIDS Programs in the Province of South Sulawesi

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Abstract

In Indonesia, South Sulawesi Province is among the top 10 highest cases nationally and is among the third highest in Eastern Indonesia after Papua and Bali. This study aims to examine the decentralization of HIV/AIDS prevention programs in the Southern Province. This research uses qualitative research method with a case study design. Data collection was carried out in South Sulawesi Province, including: Makassar City and Sidrap Regency. The location selection was based on the focus of HIV/AIDS prevention and control in South Sulawesi Province, the category of the core area. The informants in this study were the Chairperson of the Provincial AIDS Commission (KPAP) of South Sulawesi Province, the Chairperson of the Regional AIDS Commission (KPAD), the holder of the Puskesmas HIV-AIDS program and the Chair of the NGO organization concerned with HIV-AIDS in each region. The selection of informants in this study used the snowball technique. The results showed that the financing of the HIV/AIDS program in South Sulawesi Province came from the local government, the central government and assistance from abroad. Human resources for the HIV/AIDS program in South Sulawesi Province, the core focus of Makassar City and Sidrap Regency have been fulfilled and are in accordance with the qualifications consisting of doctors, nurses, laboratories, pharmacists and community health workers. HIV/AIDS logistics are provided by the central government Provincial health offices, with a one-stop system. Community empowerment in HIV/AIDS prevention has been running so that cadres are formed; cadres in the field but this empowerment has not been maximally implemented. In order for the decentralization of the HIV/AIDS prevention program to run optimally, stakeholder cooperation is needed in its implementation so that the number of HIV/AIDS cases in the province of South Sulawesi, especially in core areas such as Makassar City and Sidrap Regency, can decrease.

Keywords: Decentralization, Prevention Programs, HIV/AIDS, South Sulawesi Province.

Introduction

Asia Pacific is the second largest region with HIV/AIDS cases in the world, where 78% of new cases are in the Asia Pacific region. It is estimated that 5.9 million people are living with HIV in the Asia Pacific Region in 2018. While the three countries with the most cases in Asia Pacific are India, China and Indonesia.¹ In 2018, new cases of HIV infection in Indonesia were the highest compared to other Southeast Asian countries. There are 46,000 new HIV infections and only 51% of people living with HIV know their status².

In Indonesia, South Sulawesi Province is among the top 10 highest cases nationally and is among the third highest in Eastern Indonesia after Papua and Bali³.
Based on data from the South Sulawesi Provincial Health Office, the trend of HIV-AIDS cases has tended to increase in the last three years (South Sulawesi Provincial Health Office, 2019). Based on a report from the South Sulawesi Provincial Health Office in 2018, an estimated 16,676 people living with HIV and those found to be HIV+ were around 8,821 and 10,879 who entered care, started ART 5,965 and those who are still doing ART 3,254. As for testing in the risk group in 2018, it seems that it is still far from the expected target, especially in the MSM, FSW, Risti partner, and TB group (The number of testing in the Risti partner was 2,994 while the target was 57,839; for TB patients the number of testing was 9,108, the target was 68,054; MSM testing number 4,499 and target 16,594).

In the distribution of the number of HIV-AIDS cases in districts/cities in South Sulawesi, data were obtained from 8 districts/cities with the highest number of HIV/AIDS cases, namely Makassar City (10,819 cases), Pare - Pare (561 cases), Jeneponto Regency (369 cases), City Palopo (298 cases), Wajo District (203 cases), Sidrap Regency (198 cases) and Bulukumba Regency (178 cases). The high number of HIV/AIDS cases in South Sulawesi is a commitment of all parties in order to reduce the spread of these cases. This study aims to examine the decentralization of HIV/AIDS prevention programs in the Southern Province.

**Materials and Method**

This research uses qualitative research method with a case study design. Data collection was carried out in South Sulawesi Province, including: Makassar City and Sidrap Regency. The location selection was based on the focus of HIV/AIDS prevention and control in South Sulawesi Province, the category of the core area. The informants in this study were the Chairperson of the Provincial AIDS Commission (KPAP) of South Sulawesi Province, the Chair of the Regional AIDS Commission (KPAD), the holder of the HIV/AIDS program at Puskesmas and the Chair of the NGO organization concerned with HIV/AIDS in each region. The selection of informants in this study used the snowball technique. The data analysis technique in this study used qualitative data analysis.

**Results**

The implementation of HIV/AIDS prevention programs in South Sulawesi Province was assessed based on research variables, namely financing, human resources, logistics and community empowerment.

The source of funding for the HIV/AIDS Program in South Sulawesi Province consists of APBD funds and funds from foreign NGOs in the form of activities to support local government program activities in the HIV/AIDS prevention program. Based on the results of interviews related to funding with informants, the following information was obtained:

“The source of funding comes from the local government, from the previous year we got it from the Global fund, there is also the HIV Coorperate Intervention Program from the Australian government, the funds are for institutional strengthening support for KPA administrators in South Sulawesi Province” (KP, 50 years)

“The funds we have obtained are grants from a global fund” (N 28 years)

“... sourced from the APBD sir” (K, 30 years)

From the informant’s statement regarding funding related to HIV prevention in the South Sulawesi province, it comes from the Regional Budget (APBD) and comes from assistance from abroad such as a global fund.

Human resources in the HIV/AIDS prevention program in South Sulawesi Province include availability/adequacy, distribution and capacity building of HIV/AIDS personnel. The HIV/AIDS prevention program requires sufficient personnel both in terms of numbers and qualifications, both those who work in the health office and HIV/AIDS personnel at the Puskesmas. The health workers needed at the Puskesmas in the HIV/AIDS prevention program are doctors, laboratory staff, nurses, pharmacists and public health workers. This is as conveyed by the following informants:

“In terms of resources, Alhamdulillah it is sufficient” (KD, 45 years)

“The qualifications for the HIV/AIDS prevention program are already due to the fact that there are doctors, laboratory assistants, nurses, pharmacists and public health workers involved in the HIV/AIDS program” (KP, 50 Years)

“We here consist of doctors, laboratory assistants, nurses like me, pharmacists and community health workers” (TS, 30 years)
The distribution of HIV workers is still a concern in the utilization of human resources in the HIV/AIDS prevention program in South Sulawesi Province with a focus on Makassar City and Sdrap District. The distribution of Puskesmas personnel determines the availability of HIV/AIDS personnel at the Puskesmas. Puskesmas located in urban areas are the main choice for health workers. Meanwhile, health centers that are far from urban areas are still minimal and have not yet fulfilled service needs, due to problems in access (affordability), safety factors, availability of needs, and housing.

“The distribution of HIV/AIDS program personnel in the city of Makassar already exists in every puskesmas, but sometimes there are prevention programs that have not run optimally” (K, 45 years)

“. .. if our distribution here is good ...” (R, 40 years)

Capacity building is carried out in the form of providing training to HIV/AIDS personnel to improve skills in services and recording and reporting

“There is always capacity building, what’s more with the assistance from a global fund which then organizes training activities for us” (K, 45 years old)

“. .. So there are already training activities for fellow HIV/AIDS program holders, ... (N, 28 years old)

The logistics of the HIV/AIDS program is a supporter of the HIV/AIDS response program services in South Sulawesi Province. In general, the logistics procurement for the HIV/AIDS program in the Province of South Sulawesi comes from procurement from the Province and the APBN. Based on the results of interviews related to logistics with informants, the following information was obtained.

“Through the mechanism of the Ministry of Health then to the Provincial Health Office then the Pharmacy Warehouse then the NGO/Partner Officer” (DS, 40 years)

“For logistics at our puskesmas it is sufficient, but during this pandemic there is a lack of logistics but there is no vacancy in our puskesmas” (K, 45 years).

Community empowerment has been stipulated in various government policies, both central and local, as a form of community participation mechanism from the grassroots level in supporting access to health and social services for those infected. Community empowerment is an important strategy to eliminate discrimination against people infected with HIV/AIDS. Community participation in the context of non-governmental organizations (NGOs), at the operational level is the role of KPAD. KPAD conducts guidance and empowerment in local non-governmental organizations.

Currently, there are several NGOs engaged in HIV/AIDS prevention programs in South Sulawesi Province, namely the Gaya Celebes NGO, YMH, YPKDS, a fraternal organization for drug victims. The empowerment activities carried out by NGOs are training, assistance in taking medication, distribution of condoms, counseling about HIV, reproductive health and others. The Health Office in this case took part in providing material on training activities conducted by NGOs.

“. .. providing support for activities in the form of funds that they must be accountable for every year, each NGO is given a number of millions of assistance, for which they are accountable every year. Then there may also be empowerment activities such as training training, then there are also empowerments at the level of NGOs like them and this is the health office also providing material during activities at these local NGOs ... (AF, 42 years).

The budget for NGO activities for HIV/AIDS prevention and control programs comes from grant funding from abroad such as USAID, AUSAID and the Global Fund. However, currently the assistance from USAID and AUSAID has closed.

“. .. our funding runs with funding assistance from grants from abroad, namely the global fund. .. (N, 28 Years)

Discussion

The South Sulawesi Provincial Government funds the HIV/AIDS program from the APBD. Funding from APBD in 2010 to 2014-2020. This funding is coordinated by KPAD and the Health Office and distributed to SKPDs or agencies that work on HIV/AIDS prevention programs in districts/cities. Funds for HIV/AIDS programs in the Health Office also increase every year. However, the absorption rate of the budget only reaches 20-30%.
Apart from the budget originating from the APBD, funding for the HIV/AIDS program in South Sulawesi Province is also greatly helped by the funding that comes from foreign aid. International institutions are institutions that have high resources, financial resources and technical capabilities, whose role in the HIV/AIDS prevention program in South Sulawesi Province is not to create new programs but to provide support to local governments in implementing HIV/AIDS programs in South Sulawesi Province.

So far, the budget needs sourced from abroad for HIV/AIDS prevention have been met by the Global Fund, the Australian Department of Foreign Affairs, the United States Support Fund (USAID), agencies originating from the United Nations and International Non-Governmental Organizations (NGOI). However, the sustainability of funding from abroad cannot be ascertained, because every NGO has a certain contract period.

The decentralization of the HIV/AIDS prevention program urgently needs strengthening of human resources in terms of numbers, qualifications, distribution and capacity building of HIV/AIDS personnel at all levels, including the Health Office, health centers, hospitals, NGOs and cadres. Human resources engaged in HIV/AIDS programs include field personnel (peer educators, outreach workers, field program supervisors, field level program managers), service levels (counselors, specialists, general practitioners, laboratory staff, nurses, administrative officers, nutritionists, midwives, case managers) and coordination/KPA levels in districts/cities (program managers, monitoring and evaluation officers, and administrative managers). Human resources as input in the health system will greatly affect the operation of the health system itself. The availability of human resources greatly affects the running of the HIV/AIDS program.

Logistical management of HIV/AIDS prevention programs includes planning, procurement, storage, distribution, use and control of drugs and medical equipment for prevention, diagnostics and therapy. Logistics management in the health system is carried out by the ministry of health at the central level and health offices at the sub-national level. The logistics management system is expected to guarantee that the program implementation must arrive at the beneficiaries in a timely manner, fulfilling their needs with guaranteed quality. Procurement of drugs and medical equipment for HIV/AIDS prevention and therapy is currently still dependent, especially from foreign assistance, except for ARVs and some reagents which are fully prepared by the Ministry of Health. In general, policies related to pharmaceutical preparations are regulated in Government Regulation No. 72/1998 on Safeguarding Pharmaceutical Preparations and Medical Devices, which mandates the procurement of methadone and ARVs prepared by the central government. Apart from procurement by the central government, logistics for HIV/AIDS are also provided by the South Sulawesi Provincial Health Office.

Provincial health office decentralization policy. Distribution to districts/cities uses a one-door system. Currently, the logistics supply chain from the Provincial Health Office to service units such as puskesmas and hospitals is running well, except for areas with difficult geographic conditions. The Regency/City Office submits logistical requests every month to the Provincial Pharmacy Installation according to the number of cases in each Health Office. This is to ensure the availability of logistical supplies at the Health Office and service units.

Empowerment of MARPs and PLWHA communities is the key to independently providing sustainable HIV/AIDS services based on the community’s need to live healthily, both to protect themselves from HIV infection and to maintain the quality of life of PLWHA.

In carrying out their duties, NGOs receive budget assistance from KPADs with assistance from international donors. However, the activities of NGOs operating in districts/cities in South Sulawesi province are not well coordinated so that there are still many overlapping activities between NGOs. Even some activities overlap with activities carried out by the Puskesmas. So that the issue of coordination between NGOs and the government is still something that must be considered in the context of the success of the HIV/AIDS program in South Sulawesi Province. The current community empowerment is related to the implementation of HIV/AIDS prevention programs at the District/City Health Office. The cultural approach is one of the factors that must be considered in the HIV/AIDS prevention program.

The issue of communication between stakeholders was also found by Fritantus and Rukminingsi (2013) in their research in Surabaya, that communication between stakeholders is highly expected in the HIV/
AIDS prevention program. Communication between stakeholders will affect other needs such as financing, provision of human resources, and others. The sectoral ego is still an obstacle in HIV/AIDS prevention programs11.

Conclusions and Recommendations

This study concludes that the financing of the HIV/AIDS program in South Sulawesi Province comes from the local government, the central government and foreign assistance. Human resources for the HIV/AIDS program in South Sulawesi Province, the core focus of Makassar City and Sidrap Regency has been fulfilled and is in accordance with qualifications consisting of doctors, nurses, laboratory staff, pharmaceutical workers and public health workers. HIV/AIDS logistics are provided by the central government Provincial health offices, with a one-stop system. Community empowerment in HIV/AIDS prevention has been running so that cadres are formed in the field but this empowerment has not been maximized in its implementation.

Ethical Clearance: Obtained from Hasanuddin University ethical committee

Source of Funding: Self

Conflict of Interest: Nil

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Nalysis of the Use of Bags and Bottle Plastic Containers and Drug Compliance Based on Drug Swallowing Supervisor (DSS) in Reducing the Risk of Pulmonary Tuberculosis Transmission

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Abstract

Tuberculosis (TB) is still prevalent in Indonesia. In 2016, TB’s incidence rate is estimated 129 per 100,000 population. In order to reduce the incidence, reducing the risk of transmission through the patient sputum drug compliance is essential.

This is quasi-experimental study design. There are 3 groups, which are the intervention group that receives bag waterproof plastic container, bottle waterproof plastic container that both contains a 4-chloroalpha-phenyl-o-cresol (klorofenol) desinfectant with concentration of 5% as a killer of TB bacilli accompanied by promotional messages and control group (without intervention). The population is all patients with pulmonary TB Acid Fast Bacilli positive (AFB+) aged > 12 years old who come for treatment to all community health centers that have Microscopic Reference Center (MRC) facility and use Directly Observed Treatment Short-course (DOTS) strategy in Medan. The sample is selected by consecutive sampling.

There is a significant difference (p<0.05) of the risk of pulmonary TB transmission according to the role of the DSS between the treatment groups using plastic bags containers and plastic bottles with control group. There is a significant difference (p<0.05) the risk of pulmonary tuberculosis transmission based on drug compliance between the treatment groups using plastic bag containers and plastic bottles with control group. The use of containers containing

the killer disinfectant of TB bacilli in sputum accompanied by promotional messages on the walls of the container is effective in reducing the risk of TB transmission from patients with Acid Fast Bacilli positive (AFB+) pulmonary TB.

Keywords: Pulmonary TB, plastic containers, DSS, Clorofenol.

Introduction

TB is a contagious infectious disease caused by the Mycobacterium Tuberculosis, which can attack various organs, especially the lungs. If not treated or the treatment is incomplete, can cause dangerous complications, even death\textsuperscript{1-3}.

Globally, in 2016 there were 10.4 million of TB cases (CI: 8.8 million - 12 million) equivalent to 120 cases per 100,000 population. Five countries with the highest number of cases are India, Indonesia, China, Philippines, and Pakistan. Most of the TB incidence in 2016 occurred in the Southeast Asia Region (45%), where Indonesia is one of them\textsuperscript{4,5}.
According to the World Health Organization (WHO), in 2016 Korea was one of the countries with the highest number of TB incidence among other high-income countries, it is estimated at 77 cases per 100,000 population.6

Based on the Integrated TB Information System report in 2016, TB incidence rate in Indonesia estimated to be at 129 per 100,000 population, it still lower than the reality and almost 2 times higher than Korea.1

According to the Indonesia Health Ministry the number of tuberculosis was 330,910 cases, this number increased compared to 2014, which amounted to 324,539 cases.

The WHO defines the high burden countries (HBC) for tuberculosis according to 3 indicators: TB, Human Immuno Virus TB (HIV-TB), and Multi Drugs Resistance TB (MDR-TB). A country can be included in one of these lists, or both, and can even be included in all three. Indonesia along with 13 other countries are included in the HBC list for all 3 indicators. It means that Indonesia has major problems in dealing with TB.

Cough is the main mechanism of Mycobacterium TB transmission by Esmail et al., and is transmitted through aerosol which spread in the air with very small range of 1–5 μm. Various respiratory activities which produce aerosols, in addition to coughing, can also be through sneezing, singing, and talking. The cough frequency is associated with infectivity but not necessarily the cause of TB transmission. Pulmonary TB patients who often cough do not necessarily transmit, in this case the ethics when coughing plays an important role in preventing transmission of pulmonary tuberculosis.11

This research is carried out for the patients with pulmonary TB AFB+ to dispose sputum and material contacted with sputum into container containing klorofenol compound with 5% concentration. The container serves as a disposal place of tissues, disposable masks, and sputum from patients with pulmonary TB- AFB+ as a killer of Mycobacterium TB after being deposited within 24 hours.

Klorofenol is a derivative disinfectant of phenol (carbolic acid), Giacomelli, et al. report that 5% of phenol was effective in decontamination of Mycobacterium TB smear slides for 10 minutes. A study by Sarumpaet and Syarifah states that the DSS role in assisting drug swallowing and sputum examination is very lacking. Drug compliance must be done to cure pulmonary TB and the role or the activeness of DSS is expected to support the patient recovery.

Based on this, research needs to be carried out on the role of DSS in reducing the risk of TB transmission and the adherence of patients with pulmonary TB-AFB+ in swallowing drugs supplemented by the intervention of containers and waterproof plastic bottles containing 5% of klorofenol solution.

The aim and benefit of the study is to analyze the differences in the transmission risk and drug compliance for patients with pulmonary TB-AFB+ based on the DSS role in the group with plastic bags and waterproof plastic bottles compared to the control group.

Materials and Method

The research type is a quantitative study with quasi-experimental design divided into 3 groups, namely groups that receives bag waterproof plastic container, bottle waterproof plastic container that both contains klorofenol disinfectant with a 5% concentration accompanied by promotional messages and control group. The container contains a klorofenol 5% which functions as a disposal place of tissues, disposable masks, and sputum as a killer of Mycobacterium TB after being deposited for 24 hours.

Promotional messages are attached to the walls of the containers in order for the patients not to forget to take medicine, the effects if they forget to take medicine, always use mask and tissues to cover mouth when coughing, and how to prepare 5% klorofenol compound into the containers.

The population and sample are all patients with pulmonary TB-AFB+ is aged > 12 years old who come for treatment with DOTS strategy to all community health centers that have MRC facility in Medan. The sample is followed for 2 months and in the last evaluation obtained 125 patient from all MRC. The duration of the intervention for 2 months is based on the evaluation of sputum examination conducted at the MRC to assess the conversion of AFB smear positive sputum to smear negative. During the observation in this study, all patients experienced sputum conversion from smear positive to smear negative.

The effectiveness of the use of bag and bottle plastic containers as a model to reduce the transmission risk of pulmonary TB-AFB+ compared to control is performed through a 2 proportions z-test.
Results

The samples are taken purposively, that all pulmonary TB-AFB+ patients who come for treatment at 10 health centers with the highest number of pulmonary TB patients visit, obtained from the health center report data in Medan. The study is amounting to 125 patients, with 34 people getting bottles waterproof plastic (Helvetia and Sentosa Baru Health Center), 40 people getting bags waterproof plastic (Amplas, Desa Binjai, Medan Johor, and Teladan Health Center), and 51 people for control (Kampung Baru, Medan Deli, Belawan, and Mandala Health Center).

In accordance with the results of the study, the proportion distribution of the patients obtained based on the intervention is in the following Table 1.

Table 1. The Proportion Distribution Of Pulmonary Tb-Afb+ Patients Based On Intervention In Medan Health Center

<table>
<thead>
<tr>
<th>Intervention Type in Health Center</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottle Waterproof Plastic Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helvetia</td>
<td>21</td>
<td>16.8</td>
</tr>
<tr>
<td>Sentosa Baru</td>
<td>13</td>
<td>10.4</td>
</tr>
<tr>
<td>Bag Waterproof Plastic Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amplas</td>
<td>21</td>
<td>16.8</td>
</tr>
<tr>
<td>Desa Binjai</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Medan Johor</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Teladan</td>
<td>4</td>
<td>3.2</td>
</tr>
<tr>
<td>Control Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kampung Baru</td>
<td>16</td>
<td>12.8</td>
</tr>
<tr>
<td>Medan Deli</td>
<td>8</td>
<td>6.4</td>
</tr>
<tr>
<td>Belawan</td>
<td>21</td>
<td>16.8</td>
</tr>
<tr>
<td>Mandala</td>
<td>6</td>
<td>4.8</td>
</tr>
<tr>
<td>Total</td>
<td>125</td>
<td>100.0</td>
</tr>
</tbody>
</table>

With the Kruskal-Wallis test, obtained the value of p<0.05, therefore concluded that there is a difference in the risk of pulmonary TB-AFB+ transmission based on the role of DSS between the three intervention groups.

In order to discover the differences in the transmission risk of pulmonary TB between each intervention and control group, a Post-Hoc analysis using the Mann-Whitney test can be seen in Table 3 below.

Table 3. The Difference In Transmission Risk Of Pulmonary Tb Based On The Role Of Dss Between Each Intervention and Control Group

<table>
<thead>
<tr>
<th>Intervention</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottle and Bag</td>
<td>0.404</td>
</tr>
<tr>
<td>Bottle and Control</td>
<td>0.000</td>
</tr>
<tr>
<td>Bag and Control</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Based on table 3, concluded that there is no difference in the transmission risk of pulmonary TB-AFB+ based on the role of DSS between intervention groups that use bottles and bags. However, there is a significant difference (p <0.05) of the transmission risk of pulmonary TB-AFB+ based on the role of DSS between the intervention groups using bottles and control group as well as between the intervention groups using bags and control group.

To find out the differences between each intervention group, Post Hoc analysis is performed with the Mann-Whitney test which can be seen in table 5 below.
Based on table 5, it is assumed that there is no difference in the risk of transmission of pulmonary TB-AFB+ based on drugs compliance between intervention groups using bottles and bags (p>0.05). Although, there is a significant difference in the risk of pulmonary TB-AFB+ transmission based on drugs compliance between intervention groups using bottles and control group (p<0.05). Subsequently, there is a significant difference in the risk of transmission of pulmonary tuberculosis AFB+ based on drugs compliance between intervention groups using the bag and control group (p<0.05).

Table 5. The Difference In The Transmission Risk Of Pulmonary Tb-Afb+ Based On Drugs Compliance

<table>
<thead>
<tr>
<th>Intervention</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottle and Bag</td>
<td>0.762</td>
</tr>
<tr>
<td>Bottle and Control group</td>
<td>0.000</td>
</tr>
<tr>
<td>Bag and Control group</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Figure 1. Container Image

Figure 2. Bottle Image
Discussion

The result exhibits a significant difference in the risk of transmission of pulmonary TB-AFB+ based on the role of DSS between intervention groups using bag and bottle containers with control group group.

The DSS role as supervisors to remind patients to take the medication, accompanying in fetching the drugs, knowing the side effects of TB drugs, and how to dispose sputum is conveyed by the researchers when taking the samples of pulmonary TB-AFB+ patients who came to the health center at the time of the study.

With the container and the message printed on the sides of the container given to the TB patients, the promotional message can be read at any time therefore the DSS message is more easily remembered by the patients in terms of disposing sputum, as well as the regularity and compliance with the drug. Similarly, the message also will be able to increase the patients knowledge in dealing with their illnesses as the lack of the patients knowledge will make it more difficult to achieve recovery. The patients’ knowledge about symptoms, signs, causes, transmission, and treatment are also the key in preventing pulmonary TB transmission. Under these conditions, assumed that the transmission risk is smaller in patients who are given the containers than those without the containers.

The DSS role is a strategy to ensure the patients recovery with pulmonary TB (National Strategy for TB 2010-2014). A study by Firdaus KMZ in Baki Sukoharjo Health Center shows that there is an influence on the role of DSS with the success of the treatment of patients with pulmonary TB-AFB+ (p = 0.002).

Researchers Suprajitno, et al conclude that when there are mild side effects in patients with pulmonary TB, DSS can provide information to patients that it is natural and take appropriate action to overcome the side effects. Thus the patient is expected not to stop the drug and the transmission risk becomes smaller.

This research is also revealed that there is a significant difference in the transmission risk of pulmonary TB based on the drugs compliance between the intervention using bottle containers and plastic bag containers with control group. The study results of Latifatul and Umdatus also displays that there is a significant influence between family support on drugs compliance (OR = 21.99, p = 0.028). According to research conducted by Wiwit and Amila in 2018, the role of DSS for pulmonary TB patients is as a motivator, reminding sputum re-examination, supervising treatment as well as the role of educator. Furthermore, according to Rohmana, et al in 2014 that one of the factors that determine the regularity of drugs compliance of pulmonary TB patients is DSS.

Hartini T stated that the highest DSS proportion of the patients with pulmonary TB-AFB+ in Deli Serdang Regional Hospital in 2011-2012is family (81.5%). Drugs compliance is the key to the patient recovery with pulmonary TB. Since 1995 the Indonesian government has launched a program to eradicate pulmonary TB by using the DOTS strategy, which is a direct supervision of short-term treatment.

In accordance with the results of research conducted by Pameswari et al at Mayjen H.A Thalib Hospital in Kerinci Regency, it is discovered that the number of respondents who adhered to the treatment of pulmonary TBis higher than the number of patients who are semi-adherent or non-adherent patients. Out of the 27, the adherent respondents is 15 respondents (55.56%), semi-adherent is 9 respondents (33.33%), and non-adherent is 3 respondents (11.11%).

A study in India explains most of the disobedience and low motivation to seek treatment are due to lack of knowledge and awareness about the disease. The same thing is concluded from a research in Nepal, the adherence of the patients with pulmonary tuberculosis is related to the compliance, perceptions about TB, and its treatment.

Conclusion

The use of bags and bottle plastic containers containing the killer disinfectant for TB bacilli in sputum accompanied by promotional messages on the sides of the container is effective in reducing the risk of TB transmission from patients with pulmonary TB AFB+.

Conflict of Interest: None

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Ethical Clearance: From the university committee.
References


The Analysis Quality of Inpatient Room Service to Patient Satisfaction (Case Study of Saparua General Hospital)

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Abstract

A hospital is good generally considered if in providing services it pays more attention to the needs of patients and other people visiting the hospital. The purpose of this study was to analyze the service quality of inpatient room staff on patient satisfaction at the Saparua Regional General Hospital. This type of research used in this research is quantitative research with a cross sectional design. The population in this study were all inpatients at Saparua General Hospital. The samples were determined by means of incidental sampling, namely the technique of determining the sample based on chance, that is, anyone who incidentally was admitted to an inpatient at Saparua General Hospital. The results showed that there was an effect of doctor’s service on the satisfaction level of inpatients at Saparua Hospital (p value = 0.016). There was no significant effect of nursing care on the satisfaction level of inpatients at Saparua Hospital (p value = 0.134). the better the level of patient satisfaction. In order to improve the quality of human resources, especially in terms of increasing the quantity and quality of services, hospital staff need to provide training for doctors and nurses so that the services provided to patients can be better so that patients feel satisfied.

Keywords: Quality, Service officer, hospitalization, satisfaction, patient.

Introduction

Hospitals are a comprehensive form of health care organization covering aspects of health promotion, prevention, healing, and recovery for all communities that often face problems concerning patient dissatisfaction with the quality of service. Therefore, hospitals as facilitators of health services, in addition to comprehensive are also expected to provide quality health services that refer to the level of perfection of the health service1. Quality should be viewed more widely, where not only aspects are determined but also include processes, environment and humans, quality is a dynamic condition related to products, services, people, processes and environments that meet or exceed expectations.2

In the face of patient satisfaction, inevitably the provision of hospital services must maintain the quality of service continuously. Services have been patient-oriented but not in the view of healthcare providers. The size of the quality of the service provider can be seen from the service received by the patient whether it is in accordance with what has been expected.3]The quality of service has a positive and significant relationship with patient satisfaction levels, thus indicating that high levels of patient satisfaction are influenced by the high quality of service provided. The quality of service should start from the needs of the patient and end in the patient’s expectations.4]

In this study, researchers prefer patients who were hospitalized because inpatients were more likely to
experience hospital services because they received more services. Inpatient health services are one of the main concerns of hospitals around the world. This is because hospitalization is a service to patients entering the hospital who occupy a bed for observation, diagnosis, therapy, medical rehab or other medical services with daily supervision of a doctor. In addition, quality inpatient services are an important expectation because the perception of the quality of service aspect of a hospital is formed when the patient is treated.\(^5\)

A hospital is good generally considered if in providing services it pays more attention to the needs of patients and other people visiting the hospital. The quality of the service as a measure of how good the level of service provided is able to match the expectations of the customer (patient).\(^6\) Based on this definition, the quality of services can be realized through the fulfillment of the needs and desires of the patient and the accuracy of his delivery to keep up with the patient’s expectations. With Saparua hospital motto is “Patient Satisfaction is our Pride”. The purpose of this study is to analyze the quality of inpatient service to patient satisfaction at Saparua Regional General Hospital.

**Materials and Method**

The type of research used in this study is quantitative research with cross-sectional design. The population in this study was all inpatients at Saparua General Hospital. The samples in this study were some patients who were hospitalized during the study. The determination of the sample is done by way of incidental samples, namely the technique of determining samples based on coincidence, namely anyone who is incidentally admitted to an inpatient at Saparua General Hospital. Data collection techniques are primary data obtained through live interviews to respondents during the study using questionnaires, and secondary data is obtained from the medical records section of Saparua General Hospital.

**Result**

Based on table 1. The results of the study above the doctor service variable, showed that out of 42 respondents based on the doctor’s services, the most were respondents who gave a sufficient assessment of the doctor’s services as many as 24 people (57.1%) and the few who gave a poor doctor service rating of 18 people (42.9%). The nursing service showed that of the 42 respondents based on nursing services, the most were those who gave a sufficient assessment of nursing services which was 23 people (54.3%) and the fewest who rated nursing services poorly as many as 19 people (45.2%). Patient satisfaction, showed that of the 42 respondents based on patient satisfaction levels, the most were respondents who gave a satisfied rating of 23 people (54.8%) and the few who gave a disgruntled rating of 19 people (45.2%).

**Table 1. Distribution of Respondents Based on Research Variables at the Saparua Regional General Hospital in 2020**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Amount (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enough</td>
<td>24</td>
<td>57.1</td>
</tr>
<tr>
<td>Not good</td>
<td>18</td>
<td>42.9</td>
</tr>
<tr>
<td>Nursing Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enough</td>
<td>23</td>
<td>54.3</td>
</tr>
<tr>
<td>Not good</td>
<td>19</td>
<td>45.2</td>
</tr>
<tr>
<td>Patient Satisfaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfied</td>
<td>23</td>
<td>54.8</td>
</tr>
<tr>
<td>Less satisfied</td>
<td>19</td>
<td>45.2</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data 2020

**Table 2. The Influence of Research Variables on Patient Satisfaction at the Saparua Regional General Hospital in 2020**

<table>
<thead>
<tr>
<th>Research variable</th>
<th>Patient Satisfaction</th>
<th>Total</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Satisfied</td>
<td>Less satisfied</td>
<td>N</td>
</tr>
<tr>
<td>Doctor Services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enough</td>
<td>17</td>
<td>70.8</td>
<td>7</td>
</tr>
<tr>
<td>Not good</td>
<td>6</td>
<td>33.3</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>54.8</td>
<td>19</td>
</tr>
</tbody>
</table>

Source: Primary Data 2020
<table>
<thead>
<tr>
<th>Research variable</th>
<th>Patient Satisfaction</th>
<th>Total</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Satisfied</td>
<td>Less satisfied</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Nursing Services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enough</td>
<td>15</td>
<td>65.2</td>
<td>8</td>
</tr>
<tr>
<td>Not good</td>
<td>8</td>
<td>42.1</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>54.8</td>
<td>19</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2020

Based on Table 2 of the doctor service variables shows 24 respondents with sufficient assessment of the services of doctors who are satisfied with the quality of service as many as 17 respondents (70.8%) and as many as 7 respondents (29.2) who were dissatisfied. Meanwhile, of the 18 respondents with poor assessment of the service of doctors who were satisfied with the quality of service as much as 6 respondents (33.3%) and 12 respondents (66.7%) who feel less satisfied. Statistical test results obtained p value = 0.016, because the value p < α = 0.016 > 0.05 then Ho was rejected, this means that there is a statistically meaningful influence of variable doctor services on patient satisfaction in Saparua regional general hospital.

Based on the nurse service variables, 23 respondents with sufficient assessment of the care of nurses who were satisfied with the quality of service were 15 respondents (65.2%) and 8 respondents (34.8) who were dissatisfied. Statistical test results obtained p value = 0.134, because the value p > α = 0.134 > 0.05 then Ho received, this means that there is no statistically meaningful influence of nurse service variables on patient satisfaction in Saparua regional general hospital.

Discussion

The quality of medical services is consistent and sustainable with the aim of meeting the expectations of patients in Saparua regional general hospital. The effect of the quality of medical services is very influential on patient satisfaction because with the good quality of medical services make a positive contribution to the embodiment of patient satisfaction.[7] The results showed that the service of doctors with sufficient patient satisfaction, where some patients stated that satisfied with the doctor’s service. Doctors at Saparua regional general hospital strive to always prioritize patients, understand the needs and desires of patients.

The doctor’s service felt by patients visiting saparua area general hospital can be described that in providing the service the doctor explains well and details about the cause and effect of the patient’s illness, every action in the service is always followed by a good explanation and easy to understand the patient. It’s just that there are still complaints of delays in doctors conducting examinations of patients. Another study conducted by Torry et al., (2016) to determine the factors that affect health care waiting times related to patient satisfaction shows that patient satisfaction is influenced by the actual waiting time felt by the patient, and the speed of service received by the patient, whose conclusion is the main factor that prolongs the waiting time of the service and decreases patient satisfaction is the lack of optimal schedule of the doctor in charge. [8]

There are several types of services in hospitals whose quality is always assessed by patients and one of them is nursing services. Nurses as professionals have the most opportunity to provide health care, especially comprehensive nursing care by helping patients meet holistic basic needs. To perform her role properly, nurses need to have skills in clarifying grades, counseling and communication.[9] The results showed that the quality of service provided by nurses at Saparua regional general hospital was assessed by either patients or respondents. Respondents stated that officers are deft in replacing fluids, always give smiles to patients who come and officers are not picky or indiscriminate in serving and assisting patients. Respondents who were dissatisfied with the nursing services at Saparua regional general hospital were concerned with the delay in nursing services. This research is not in line with Layuk et al showing the knowledge, attitude, and skills of nurses affect the satisfaction of patients in Labuang Baji Makassar Hospital, research conducted by Nahlah et al shows that there is a human relationship to inpatient satisfaction in Pelamonia Makassar Hospital[10-15].
Conclusion

The study concluded that there is an influence of physician services on the satisfaction level of inpatients in Saparua regional general hospital (p value = 0.016). There is no significant effect of Nurse services on the satisfaction level of inpatients in Saparua regional general hospital (p value = 0.134). The better the level of patient satisfaction, in order to improve the quality of human resources, especially in terms of improving the quantity and quality of service officers the hospital needs to provide training for doctors and nurses so that the services provided to patients can be better so that patients feel satisfied.

Ethical Clearance: Taken from University ethical committee.

Source of Funding: Self

Conflict of Interest: Nil

References

Ultraviolet Light Application Model in Lowering Germs on Food Snacks Atelementary School in Makassar

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Abstract

Food is a basic need for human life. Food is very likely to be contaminated so it can cause a disease called foodborne illness. One alternative for food preservation is with irradiation. Irradiation is commonly used in food preservation with ultraviolet light.

This study aims to determine the effect of exposure for 30 minutes and 60 minutes with the application of UV light in reducing the number of germs in food snacks in the elementary school environment of Makassar. The type of research is experimental research. Sampling used in the elementary school environment of Makassar. The populations in this study are all sellers in elementary school in Makassar City. The sample in this research is 5 samples of snack food for each observation. Data obtained from examination results is tested with statistical tests which are Wilcoxon method and calculated manually. The data is presented in the form of tables, diagrams, and narration.

The results showed by UV light irradiation method on food snack samples for UV exposure for 30 minutes, according to the results of statistical tests with Wilcoxon method of 0.13 > 0.05 means that there is no effect of UV lamp used. Exposure to UV light for 60 minutes results 0.04 < 0.05 means use of UV lamps gave effect to the number of germ, the best results were obtained at UV exposure for 60 minutes, in addition to the effect of reducing the number of germs visible difference in terms of physical endurance.

The conclusion of the study is that there is no influence of UV light exposure model implementation for 30 Minutes in decreasing the number of germs in food or snack, and there is influence of exposure model of UV light application For 60 Minute in decreasing the amount of germ in snack food and snack food have durability with exposure UV rays. Suggestions for future researchers to use longer exposure time comparison. Traders can apply food preservation snacks with UV light models in lowering the number of germs.

Keywords: UV Light, Number of Germ, Preservation, Food Snack.

Introduction

In Indonesia the use of food radiation has been determined in the legislation contained in the Minister of Health Decree No. 152/Menkes/SK/II/1995 on the Amendment of Attachment of Health Minister Number 826/Menkes/PER/XII/1987 on Irradiation Food. Chintya, DR et al¹ showed the effect of UV lamp and duration of UV irradiation on physical, chemical, and microbiological properties of mulberry juice with best treatment is mulberry juice of 30 Watt UV lamp and 60 minutes irradiation time and in Suharyono’s research, et.al². The best irradiation, which took 50 seconds, in this process total microbes 1.3 x 107 CFU/ml, vitamin C content 24.64 mg/100g, and lycopene content 0.36. Irradiation with ultraviolet light does not affect the content of vitamin C and lycopene content of tomato juice. Storage for 4 days resulted in decreased vitamin C and lycopene content. 50 seconds of irradiation does not affect the color, flavor and taste of tomatoes, and is acceptable to the consumer.

One alternative food preservation is by irradiation. Irradiation commonly used in food preservation today is with ultraviolet light. This process aims to reduce deterioration due to decay and damage, and to
kill microbes. Heating is a conventional processing technology to reduce microbial contamination in foods, especially those that are pathogenic. The process of food processing with heating can cause a less favorable effect on the quality of food products in the form of decreased levels of nutrition and sensory quality. Therefore, the food processing industry continues to develop alternative preservation technologies to minimize the damage caused by excessive heat.\(^3\)\(^4\).

Long radiation is an important factor in UV irradiation. In addition to long irradiation, the rate of inactivation of microorganisms is also a factor affecting UV irradiation. Thus, the non-thermal pasteurization process needs to be developed so that the product does not experience much decrease in nutritional value but the number of microbes remain decreased so that it has a long shelf life, so I as a researcher interested to do this research titled “UV Rays Application Model In Lowering the Number of Germs In Food Snacks In Makassar City Elementary School

**Materials and Research Method**

1. **Type of Research:** The research type is experimental research that is model of application of UV rays with exposure time 30 minutes and 60 minutes in reducing the amount of germs in food snack in Makassar City and also Control to see the difference specifics.

2. **Research Sites:**
   a. **Location Inspection and sample observation:** The location of the examination and observation of samples was carried out at the Laboratory of the Health Department of the Health Polytechnic of Makassar.
   b. **Sampling Locations and Sampling:** The collection of sample is done randomly in elementary school environment in Makassar City.

3. **Time of research**
   a. The preparatory phase, including observations to prepare research proposals and data collection in January - May 2017.
   b. Implementation phase, including sampling, laboratory examination and data processing and analysis conducted in June - October 2017.

4. **Research Variables**
   a. The independent variable is the variable that influences the dependent variable ie UV light and food snack.
   b. The dependent variable is the variable that is influenced by the independent variable that is decreasing the number of germs
   c. Disturbing variables are the variables that are expected to influence the dependent variable are time, temperature and humidity.

**Objective Criteria:**

1. There is an effect of long exposure by using model of application of UV rays for 30 minutes and 60 minutes in lowering the amount of germs in food snacks.
2. No effect of long exposure by using model of UV rays There is a long effect of exposure by using model of UV light application for 30 minutes and 60 minutes in reducing the amount of germs in food snacks.
3. Physical food snacks in this study is the quality of food that includes odor, taste, and texture.
4. Time in this study is the long exposure to food that is preserved by using irradiation technique.

5. **Population and Sample**
   a. Population The population referred to in this study are all sellers in elementary school in Makassar.
   b. Sample in this research is 5 sample of snack food that is for snack food each each observation.

7. **Data Analysis:** Data obtained from the examination results in statistical tests with Wilcoxon method and done manually and presented in the form of tables, graphs, and narration.

**Results**

Based on the research that has been done and analyzed in the Laboratory of Environmental Health Department, with examination as much as 5 times repetition for the parameters of the number of germs, the results obtained examination as follows:
1. UV Exposure 30 Minutes

Table 1. Results of Checking Number of Germs Food Snack Sample with UV Light Exposure 30 Minutes.

<table>
<thead>
<tr>
<th>No</th>
<th>Sample</th>
<th>Result (colony/g)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Beginning 30' 120' 240' 360'</td>
</tr>
<tr>
<td>1</td>
<td>30'</td>
<td>4.156.666 1.066.666 4.136.666 3.403.332 2.679.999</td>
</tr>
<tr>
<td>2</td>
<td>Control</td>
<td>4.156.666 2.033.333 3.209.866 1.970.000 1.399.999</td>
</tr>
</tbody>
</table>

Based on table 1 can be seen that the results of examination of the number of germs in food snacks samples for UV exposure for 30 minutes obtained an average of the initial sample of 4.156.666 colonies/g, sample observations to 30 minutes of 1.066.666 colonies/g, observation to 120 minutes 4,136,666 colonies/g, sample observation to 240 minutes 3,403,332 colonies/g, and 360 minutes observation samples of 2,679,999 colonies/g.

Table 2. Results of statistical tests with wilcoxon method

<table>
<thead>
<tr>
<th>Test Statistics(^a)</th>
<th>UV30 30 Menit - Kontrol 30 Menit</th>
<th>UV30 120 Menit - Kontrol 120 Menit</th>
<th>UV30 240 Menit - Kontrol 240 Menit</th>
<th>UV30 360 Menit - Kontrol 360 Menit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>-1.483(^b)</td>
<td>-1.214(^c)</td>
<td>-1.483(^c)</td>
<td>-1.214(^c)</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.138</td>
<td>.225</td>
<td>.138</td>
<td>.225</td>
</tr>
</tbody>
</table>

a. Wilcoxon Signed Ranks Test, b. Based on positive ranks., c. Based on negative ranks.

From the results of statistical tests with wilcoxon method obtained for UV with time 30 Minutes result 0.13> 0.05 means there is no effect of UV lamp use. For observation after 120 minutes result 0.22> 0.05 means there is no effect of UV lamp use. For observation after 240 minutes the result of 0.13> 0.05 means there is no effect of UV lamp use. For observation after 360 minutes result 0.22> 0.05 meaning there is no effect of usage of UV lamp.

The results of the average examination of the decrease in the number of germs on the treatment can be seen more clearly on the graph as follows:

![Figure 1. Graph of examination on average decrease amount of exposure 30 minutes](image-url)
2. 60 Minute UV Exposure

Table 3. Results of Checking the Number of Food Sample Germs with 60 Minute UV Light Exposure

<table>
<thead>
<tr>
<th>No</th>
<th>Sample</th>
<th>Result (colony/g)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Beginning</td>
</tr>
<tr>
<td>1</td>
<td>60’</td>
<td>4.156.666</td>
</tr>
<tr>
<td>2</td>
<td>Control</td>
<td>4.156.666</td>
</tr>
</tbody>
</table>

Based on table 3 can be seen that the results of examination of the number of germs in food snack samples for UV exposure for 60 minutes obtained an average of the initial sample of 4.156.666 colonies/g, sample observations to 60 minutes of 1,289,999 colonies/g, observation to 120 minutes for 2,471,999 colonies/g, sample observation to 240 minutes for 3,413,333 colonies/g, and 360 min observation samples of 3,228,666 colonies/g.

Table 4. Results of statistical tests with wilcoxon method

<table>
<thead>
<tr>
<th>Test Statistics&lt;sup&gt;a&lt;/sup&gt;</th>
<th>UV60 60 Menit - Kontrol 60 Menit</th>
<th>UV60 120 Menit - Kontrol 120 Menit</th>
<th>UV60 240 Menit - Kontrol 240 Menit</th>
<th>UV60 360 Menit - Kontrol 360 Menit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>-2.023&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-948&lt;sup&gt;bc&lt;/sup&gt;</td>
<td>-1.214&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.043</td>
<td>.345</td>
<td>.225</td>
<td></td>
</tr>
</tbody>
</table>

a. Wilcoxon Signed Ranks Test, b. Based on positive ranks., c. Based on negative ranks.

From the results of statistical tests with wilcoxon method obtained for UV with time 60 Minutes result 0.04 <0.05 meaning there is influence of usage of UV lamp. For observation after 120 minutes result 0.34> 0.05 meaning there is no effect of usage of UV lamp. For observation after 240 minutes the result of 0.34> 0.05 means no effect of UV lamp use. For observation after 360 minutes result 0.22> 0.05 meaning there is no effect of usage of UV lamp. The results of the average examination of the decrease in the number of germs on the treatment can be seen more clearly on the graph as follows:

Figure 2: Graph of examination of the average decrease in the number of germs 60 minute exposure
### 3. Physical Observation UV 30 Minutes

**Table 5. Physical Observation Results of Food Samples with UV Exposure 30 Minutes**

<table>
<thead>
<tr>
<th>No</th>
<th>Samples</th>
<th>Physical Observation Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Taste</td>
</tr>
<tr>
<td>1</td>
<td>30'</td>
<td>Good</td>
</tr>
<tr>
<td>2</td>
<td>Control</td>
<td>Not good</td>
</tr>
</tbody>
</table>

Based on Table 5, it can be seen that the physical observation of food samples with 30 minute UV exposure shows an average that is having good taste quality, and odorless, but its texture is not good, whereas on physical observation result for control generally have taste, and texture is not good but no smell.

### 4. Physical Observation UV 60 Minutes

**Table 6. Physical Observation Results of Food Samples with 60 Minute UV Exposure**

<table>
<thead>
<tr>
<th>No</th>
<th>Samples</th>
<th>Physical Observation Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Taste</td>
</tr>
<tr>
<td>1</td>
<td>60'</td>
<td>Good</td>
</tr>
<tr>
<td>2</td>
<td>Control</td>
<td>Not good</td>
</tr>
</tbody>
</table>

Based on Table 6, it can be seen that the average result of physical observation of food samples with 60 minute UV exposure that has the quality of taste and texture is still good and odorless, while the average result of control observations generally have a bad taste and texture, but no smell.

### Discussion

1. **UV Exposure 30 Minutes:** Foods consumed should not only meet the nutrients and have an attractive shape, but also safe in the sense that does not contain microorganisms and chemicals that can cause illness and safe for consumption. Safe foods are non-contaminated, containing no microorganisms or bacteria and harmful chemicals.

   Irradiation commonly used in food preservation today is with ultraviolet light. This process aims to reduce deterioration due to decay and damage, and to kill microbes. Radiation can inhibit the growth of bacteria, molds, and yeasts.

   Based on the results of examination of the number of germs on food snacks samples for UV exposure for 30 minutes obtained an average of 4.156.666 colonies/g, initial sample after 30 minutes exposure experienced a decrease in the number of germs of 1,066,666 colonies/g, sample observation to 120 minutes the number of germs increased to 4,136,666 colonies/g, sample observation to 240 minutes the number of germs decreased to 3,403,332 colonies/g, and decrease in germs still occurred in the observation sample to 360 minutes of 2,679,999 colony/g.

   Based on the result of statistical test with Wilcoxon method obtained for UV after exposure of 30 minutes result 0.13 > 0.05 meaning there is no influence of UV lamp usage. For observation after 120 minutes result 0.22 > 0.05 means there is no effect of UV lamp use. For observation after 240 minutes the result of 0.13 > 0.05 means there is no effect of UV lamp use. For observation after 360 minutes result 0.22 > 0.05 meaning there is no effect of usage of UV lamp. So when compared between laboratory results with statistical tests used it is appropriate that no effect of 30 minute UV light exposure, which is significant, but there is a decrease in the number of germs.
The physical observations on food samples with 30 minute UV exposure showed the average of good taste quality, and odorless, but the texture is not good. This is obtained from UV irradiation for samples I, II and III each having a taste and texture quality that is still good and odorless, in contrast to the IV sample where the taste with good quality on the top surface but the texture on the bottom is not good or watery as well as smelling and sample V physical qualities with an already bad taste, or watery and smelly. The difference in yield is likely due to the selection of samples or samples used on each experiment varies.

Compared with control samples the average physical observation showed flavor, and the texture was not good but odorless. This is because the control sample is not treated with UV light. So the use of UV light to see the physical quality of the food has an effect because the observed food samples are still able to survive until the second day. In this study when compared with previous studies have different objectives and different method but in essence have similarities in terms of function that with UV light irradiation can affect the quality of microorganisms that can reduce the number of germs.

In addition microorganisms can grow on food because it is influenced by several factors one of which ultraviolet light radiation with a certain wavelength and ionization radiation such as X rays and gamma rays can be easily absorbed by the cells of microorganisms. Such rays can disrupt cell metabolism and can generally be rapidly deadly. Based on the theory that ultraviolet rays have the ability to influence the function of living cells by altering the material of the intisel, or DNA, so that the creature dies. This effect is used as a basis for inhibiting the growth of microorganisms in foodstuffs. Therefore exposure to UV light for 30 minutes in general does not give a significant effect on the amount of germs so it is advisable that the duration of exposure added.

2. 60 Minute UV Exposure: Based on the research, the result of examination of the number of germs on food snack samples for UV light exposure for 60 minutes obtained the average of the initial sample of 4,156,666 colonies/g, the observation sample to 60 minutes of 1,289,999 colonies/g, 120 observation samples minutes of 2,471,999 colonies/g, a sample of 240 minutes observation of 3,413,333 colonies/g, and a 360-minute observation sample of 3,228,666 colonies/g.

Based on statistical test results with wilcoxon method obtained for UV with 60 Minutes exposure result 0,04<0,05 meaning there is influence of usage of UV lamp. For observation after 120 minutes result 0,34>0,05 meaning there is no effect of usage of UV lamp. For observation after 240 minutes the result of 0,34>0,05 means no effect of UV lamp use. For observation after 360 minutes result 0,22>0,05 meaning there is no effect of usage of UV lamp. So it can be concluded that 60 minutes of UV exposure had an effect on the first 60 minutes of observation, but observations after 120 minutes, 240 minutes, and 360 minutes had no effect, but there was a decrease in the number of germs.

Therefore, the duration of exposure has an effect on the decreasing amount of bacteria in food samples. As it is known that the decrease in the number of germs is greater when UV exposure is done longer because UV light is known to be one of the rays with radiation power that can be lethal to the organism. UV light has a wavelength of 4 nm to 400 nm with the highest efficiency for microorganism control is 365 nm. UV has a lethal effect on the cells of microorganisms, UV radiation is often used in places that require aseptic conditions such as laboratories, hospital operating rooms, and food and beverage and pharmaceutical production rooms.

On the physical observation with 60 minute UV exposure shows the average of taste and texture quality is still good and odorless. Where food samples with 60 minute UV exposure showed a better durability effect in comparison with 30-minute UV exposure because samples I, II, III and IV each had good quality flavor and texture and odorless, and the sample V was not good, the texture is not good or watery and smelly. This is because the sample used for the examination has less endurance. In addition, physically the texture of the food is easily damaged

When compared with the result of examination the number of germs on food snack samples for the control obtained average of the initial sample of 4,156,666 colonies/g, on the observation sample to 30 minutes decreased the number of bacteria amounted to 2,033,333 colonies/g, sample observation to 60 min of 3,863,333 colonies/g, observation sample to 120 mins 3,209,866 colonies/g, sample observation to 240 mins 1,970,000 colonies/g, and 360 min observational samples of 1,399,999 colonies/g, so there was a difference between 60 minutes of UV exposure and a control sample not treated with UV light.
Ultraviolet light is an energy that has the ability to penetrate into the cell wall of microorganisms and is able to change its nucleic acid composition. Ultraviolet absorption by DNA (or) RNA. The advantage of using ultraviolet light rather than chemical disinfection is very effective in killing most pathogenic bacteria such as E. coli, Giardia, Lamblia, and Cristoporidium, without chemicals, non-toxic, significant non-hazardous, non-hazardous overdose, eliminating some organic contaminants, having no volatile organic compound emissions or toxic air emissions, no odorless and odorless changes in the finished product, enough with less contact time (seconds or minutes) to chemical disinfection, and does not require storage of hazardous materials\textsuperscript{7,8}.

The results of previous research conducted by Srigede\textsuperscript{9}, is the effect of long time sterilization of ultraviolet light on the growth of Bacillus sp bacteria, the results obtained that the longer sterilization time decreases the number of bacteria Bacillus sp. Based on research data showed that there was a decrease in the number of bacteria Bacillus sp in each treatment. After sterilization of 30 minutes 60 minutes, 90 minutes, and 120 minutes using ultraviolet light seen that there is a decrease in the number of bacteria is greatest after sterilization of ultraviolet light for 120 minutes.

When compared to the two previous studies the longer the diminished irradiation of the number of different bacteria with the purpose of this study is to determine the effect of UV light irradiation method on food snacks but have similarities in terms of influence of UV rays are able to reduce the amount of germs.

So the use of UV light irradiation method in this study has an effect although the decrease is not significant is due to less exposure time and suggested to increase the exposure time\textsuperscript{10-13}.

**Conclusion**

1. There is no effect of UV model for 30 minutes in reducing the amount of germs in food snacks.
2. There is influence of UV light implementation model for 60 Minutes in decreasing the amount of germs in food snack.
3. Food snacks have long endurance with the presence of UV exposure

**Ethical Clearance:** Taken from University ethical committee

**Source of Funding:** Self  
**Conflict of Interest:** Nil

**References**

9. Srigede, L. et al., exposure to ultraviolet (UV) rays by observing sterilization time against bacterial growth of bacillus sp.jurnal. Department of Health Analyst Poltekkes Kemenkes Mataram,


Evaluation of Drug Planning and Procurement at the Pharmacy Installation of Regional General Hospital
Dr. M. Haulussy Ambon

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Abstract
Pharmacy Installation is part of the hospital responsible for implementing drug management which includes selection, procurement, distribution and use of the drug. This research aims to evaluate the planning and procurement of medicines in Dr. M. Haulussy Ambon Hospital Pharmacy Installation. Research uses descriptive design with retrospective and concurrent data retrieval. Retrospective data is data obtained by tracing the previous year’s documents (secondary data) in 2018 including financial statements, drug planning and use reports, drug procurement reports, and invoices. Retrospective data retrieval is carried out on, the percentage of conformity between drug planning and the reality of use for each drug. Concurrent data is data obtained at the time of research or is primary data with in-depth interviews with IFRS officers as well as discussions with officers/employees related to drug management. The results showed the Procurement stage of the procurement of funds for each drug item already met the standards. The suitability of planning with the wear reality for each item is not in accordance with the standard (less than 100%). It is expected to cooperate well with related parties, especially pharmaceutical installations in drug planning and management so that the use of existing funds can be more efficient and effective.

Keywords: Planning, Procurement, Medicine, Pharmaceutical Installation, Hospital.

Introduction
The hospital is a health care institution for the community with its own characteristic1-5. Hospitals are heavily influenced by the development of health sciences, technological advances, and socioeconomic lives of people who must still be able to improve quality and affordable services by the community in order to realize the highest degree of health. One of the activities in the hospital to support quality health services is pharmaceutical services. Pharmacy services in hospitals are organized by the installation of hospital pharmacies that have two main functions, namely, managerial functions and professional functions.6-7

Annual drug planning with purchases, fluctuations in drug use and government policies are changing. Inefficient management of the drug causes the level of availability of drugs to be reduced, the emptiness of the drug, the number of drugs that accumulate due to inefficiencies of drug planning, as well as the number of expired/damaged drugs due to poor distribution system so as to impact the inefficiency of budget/cost use8,9.

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he development of the pharmaceutical world as well as the demands of patients and the public on the quality of pharmaceutical services require a change from product oriented to patient oriented\textsuperscript{10}. So that services to patients must be considered ranging from basic elements or supporting elements so that patient satisfaction can be fulfilled well in order to achieve the goal of improving quality of life. In addition, in order for the agency to get a good outcome as a result of maximum service\textsuperscript{11}.

The importance of drug management in pharmaceutical installations in achieving optimal health services in hospitals If the hospital is unable to plan and implement drug management properly then the hospital is not able to reach the point of success. The failure of logistics management will decrease the quality of hospital services so that patient satisfaction will also decrease\textsuperscript{12}. The non-smooth management of the drug can have a negative impact on the hospital\textsuperscript{13}.

Dr. M. Haulussy Ambon Hospital is a type B hospital with type Of Non-Educational Hospital in accordance with the Decree of the Minister of Health No. 1069/Menkes/SK/XI/1992 which in PERDA No.06 of 1994 dated December 22, is the most complete hospital in Maluku so that it becomes the only referral hospital in Maluku Province. Therefore, services at Dr. M. Haulussy Hospital should be very considered including services provided by inpatient and outpatient pharmacy installations, including services to patients of BPJS (Social Security Regulatory Agency) Health who have cooperated with the government, especially Dr. M. Haulussy Ambon Hospital. With the smelting of ASKES and JAMKESMAS into BPJS on January 1, 2014, coupled with the expansion of BPJS program services to the general public who want to have health insurance, more and more BPJS participants must be served in pharmaceutical installations\textsuperscript{14}.

One of the important components of supporting the achievement of the hospital’s goal in providing quality health services\textsuperscript{15-17}. The quality of drug management, where the management of medicine in the hospital is the task and responsibility of the installation of hospital pharmacy with the aim of organizing professional drug management activities based on pharmaceutical procedures and professional ethics. Drug management based on applicable rules and standards, evaluating and providing quality services, conducting supervision based on applicable rules, conducting research and development in the field of pharmacy and method improvement, and facilitating and encouraging the formulation of hospital treatment and formulary\textsuperscript{18}.

According to Quicket al (2012) the drug management cycle covers four stages, namely: selection, procurement, distribution and use. Drug management at each stage in this cycle of drug management is interconnected which must be managed properly and organized in order for activities to run properly and support each other so that the availability of medicines can be guaranteed to support health services and become a potential source of hospital revenue\textsuperscript{19}.

Related to the above, in general there are some problems related to drug management in The Pharmacy installation of Dr. Regional General Hospital. M. Haulussy Ambon year 2016, among others the percentage of drug availability has not reached the indicator of availability of drugs set for hospital accreditation standards namely 80%, found expired/damaged drugs, high demand for fickle types of drugs from prescription authors, delay sending drugs from suppliers, high copy of prescriptions, not to the maximum function of pharmaceutical committee and therapy in developing policy and evaluation of drug management thus affecting the process of planning and procurement of drugs in Hospital Dr. M. Haulussy Ambon. The purpose of this research is to evaluate the process of planning and procurement of drugs at Dr. M. Haulussy Ambon Hospital.

**Materials and Method**

The study used a descriptive design with retrospective and concurrent data retrieval. Retrospective data is data obtained by tracing the previous year’s documents (secondary data) namely 2018 including financial statements, planning and drug use reports, drug procurement reports, and invoices. Retrospective data retrieval is carried out on, the percentage of conformity between drug planning and the reality of use for each drug. Concurrent data is data obtained at the time of research or is primary data with in-depth interviews with IFRS officers as well as discussions with officers/employees related to drug management.

**Result**

In-depth interviews conducted by researchers to informants at Dr. M. Haulussy Ambon Hospital as the main data retrieval technique supported by interview guidelines. What is curious in this study is
how the management of the drug in the Pharmaceutical Installation of Dr. M. Haulussy Ambon Hospital has been implemented which includes the stages of planning and procurement.

At the planning stage of pharmacy installation the hospital uses consumption method for the drug planning process, while for the procurement of drugs is carried out by procurement directly according to the needs ordered directly to the supplier. In this case the supplier already has cooperation with the hospital and that provides a lower price than other suppliers. The efficiency of drug management at this stage is measured using several indicators, among others: Percentage of capital/funds available with the overall funds needed for drug procurement.

In this indicator can be seen whether the allocation of available funds is sufficient or not to meet the needs of the purchase needs of hospital patients’ drug needs, by limiting the total allocation of funds provided with the real need for funds needed for the purchase of medicines. Data is obtained retrospectively. The percentage of funds available with the required is presented in table 1.

### Table 1. Percentage of available capital/funds with total funds required for drug procurement

| Description                  | Total Value (IDR) | Fund (%) | Score  
|------------------------------|-------------------|----------|--------
| The amount of funds required | 22,506,097,800.00 | 85       | 100    
| Available funds              | 19,149,270,000.00 | 15       |        
| Amount of Funds Required     | 3,356,827,800.00  | 100      |        

Source: Secondary data RSUD Dr. HM Haulussy Ambon

Table 1 shows the percentage of hospital funding provided to IFRSUD Dr. H. M. Haulussy is 85%. Based on the results of interviews with informants about the planning and procurement stage about the percentage of capital/funds available with all the funds needed for drug procurement. Here’s an excerpt from the interview:

“The procurement of medicines and BHP handled directly by the Hospital” (RT, 58 Years)

“The first fund. If a special method does not exist, it is ordered as needed and the hospital procurement is adjusted to the hospital planning made by the hospital planning department”. (RT, 58 Years)

“Obviously not enough because the funds are lacking, so it’s right that the drug order is tailored to my needs and has to go through i can just order medicine” (RT, 58 Years)

“The drug procurement budget has so far been adjusted to the proposal of the planning department. Of course not enough to meet the drug purchase budget” (DR, 47 Years)

“Yes, because it is often cut during budget discussions” (SA 49 Years)

Percentage of planning suitability with the wear reality for each drug item. The purpose of the indicator of planning conformity with the reality of use is to know the suitability between the procurement of drugs done in the hospital and the reality of the existing drug can be known with certainty. Observations are made by taking data on the number of drug items in The Pharmaceutical Installation of Dr. H. M. Haulussy Ambon Hospital in 2018 compared to the number of drug items that are in accordance with the planning. The percentage of suitability of drug items with planning can be seen in table 2.
Table 2: Percentage of planning suitability with actual use for each drug item

<table>
<thead>
<tr>
<th>Information</th>
<th>Score</th>
<th>Score Standard (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of drug items in planning 2018</td>
<td>358</td>
<td></td>
</tr>
<tr>
<td>Number of medicinal items according to actual use</td>
<td>340</td>
<td></td>
</tr>
<tr>
<td>% Compatibility of available medicinal items with actual use</td>
<td>94.7</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Processed secondary data, 2020

Table 2 shows that the number of drug items in IFRS RsUD Dr. H. M. Haulussy Ambon listed is 358 items, while the number of drug items contained in the reality of use is 340 items, and the number of drug items not included in the procurement of 18 items. From the observations made the percentage of conformity between the procurement of drugs carried out by IFRS Hospital Dr. H. M. Haulussy Ambon with the reality of use is 94.7%. The percentage result obtained is good enough, but it is still said not to be in accordance with the standard stipulated in Pudjaningsih (1996) which is 100%, so it is necessary to strengthen the use of hospital formulary and implementation priorities by the hospital management. Because the accuracy of drug planning based on formulary greatly affects the function of the budget.

Based on the results of interviews with informants about the planning and procurement stages about the percentage of planning suitability with the reality of use for each drug item. Here’s an excerpt from the interview:

“The data on the needs of the first drug from the pharmacy first that I checked, if it was appropriate i just submitted to the planning to be processed and matched with financial condition. so can’t order drugs haphazardly without my consent” (RT, 58 years old)

“First of all, the proposed planning of medicines and consumables from pharmaceuticals is put into our section and then processed.” (SA, 49 Th)

“The one who devised the drug needs plan was my staff in the warehouse because he knew in and out of medicine. Which drugs are widely used and underused. Selection is conducted by the Therapeutic Pharmacy Committee but is not involved in planning and procurement” (PB, 38 Years)

Discussion

Researchers found that the funds allocated for the purchase of drugs were not all used for the purchase of drug needs but also for non-medicinal, e.g. the purchase of laboratory reagents, radiological materials, as well as consumables that turned out to spend nearly 70% of the total funds on existing drug purchases. This causes the allocation of drug purchase funds to decrease. This problem may not occur if the allocation of existing funds is all only for the purchase of the drug and is not divided by purchases other than the drug. Thus, it is hoped that the need for a planned drug purchase fund can be sufficient for patient services. Other research results in accordance with similar research conducted by Costa (2016) at Ungaran Hospital obtained a percentage of the provision of funds by the hospital to Ungaran hospital pharmacy installation for drug procurement is 100%.

The installation of pharmacy is a revenue center in the hospital, therefore the function of the budget is one of the important basic data to be known in the planning of the supply of drugs both of type and quantity so that the drug manager must be involved to the maximum in the discussion of the budget and allocation of drug procurement funds. When viewed from the results of this study, the funds provided are standardized at 36.69% but still insufficient because the value of the needs is higher than the value of the allocated funds and this fund is also included for the purchase of reagents from laboratories, rontgen materials, and consumables. So it’s not purely just for the purchase of drugs.

Percentage of capital/funds available with the overall funds needed for drug procurement. The results obtained in this study are 85%. This is not in accordance with the Standard in Pudjaningsih which is 100%. In accordance with information from the Director of Dr. M. Haulussy Hospital that the amount of funds obtained so far is not sufficient to meet all the needs of medicines in the hospital, so many medicines that have been planned cannot be purchased or medicines forced to be reduced in number from those already planned to meet all needs other than medicines.
The increase in the efficiency of the percentage of capital/drug procurement funds in Dr. H. M. Haulussy Ambon hospital can be done by selectively planning the needs of the drug with correction referring to ven method i.e. classifying drugs based on (vital, essential and non-essential), ABC analysis method, adjustment of consumption method with epidemiological method based on disease pattern, data on number of visits as well as frequency of disease.

Other research results are in accordance with similar research conducted by Costa (2016) in the hospital. Ungaran obtained the percentage of the provision of funds by the hospital to the pharmaceutical installation of Ungaran hospital for the procurement of drugs is 100 %\(^2\), while Mompewa (2019) in Poso Pharmacy Installation of Central Sulawesi Province is 89.31%\(^2\), Mahdiyani et al (2018) that the percentage of the allocation of drug procurement funds in Muntilan Hospital Pharmacy Installation, in 2015 amounted to 26.13% and in 2016 amounted to 27.57%\(^2\).

From observations made by researchers at Dr. M Haulussy Ambon Hospital, researchers found that the funds allocated for the purchase of medicines were not all used for the purchase of drug needs but also for non-medicinal, e.g. the purchase of laboratory reagents, radiology materials, as well as consumables that apparently spent almost 70% of the total funds purchasing existing drugs. This causes the allocation of drug purchase funds to decrease. This problem may not occur if the allocation of existing funds is all only for the purchase of the drug and is not divided by purchases other than the drug. Thus, it is hoped that the need for a planned drug purchase fund can be sufficient for patient services.

Percentage of planning suitability with the wear reality for each drug item. In this study, the results were obtained by 94.7%. This indicates that the percentage of planning conformity with the reality of use for each drug item in the Pharmaceutical Installation of Dr. M. Haulussy Ambon Hospital has not been in accordance with the standard of 100%. The results of this study do not correspond to some similar studies namely by Endarti that the comparison between the number of drug items in the planning and the number of drug items in the reality of use obtained results for 2015 by 104.08% and in 2016 there was a decrease with a result of 80.80%. Research conducted by Mompewa amounted to 96.28% at Poso Central Sulawesi Hospital Pharmaceutical Installation\(^2\).

This is influenced by the allocation of funds provided by hospitals that do not meet the needs or are still lacking. Due to the lack of funds, it has an impact on cutting the number and items of the drug held. Another factor that affects the ineffectiveness of planning with the reality of using the drug is the addition of certain drug items outside of the drug items that have been planned in the middle of the budget year to answer the needs of medical services not to the maximum application of the drug needs plan system is also affected by the absence of planning system based on information management system technology, the system used is still a manual method. prescribing patterns by doctors have not been consistent because of the lack of clinical pathways.

Another thing that quite affects the design of drug planning with the reality of use is if there are new cases of disease that have not been prepared for drugs and are not included in the hospital formulary. Cases like this cause prescribing to change and additional funds are needed to meet treatment needs. In addition, clinical pathway is also not fully run so the prescribing of the drug has not been as expected. This should be of concern to the hospital management to implement clinical pathways in order for the prescribing of the drug to be controlled\(^2\).

**Conclusion**

Based on the results of research conducted at Dr. H. M. Haulussy Ambon Hospital Pharmacy Installation on drug planning and management can be concluded that the procurement stage of procurement fund allocation of each drug item already meets the standards. The suitability of planning with the wear reality for each item is not in accordance with the standard (less than 100%). It is expected to cooperate well with related parties, especially pharmaceutical installations in drug planning and management so that the use of existing funds can be more efficient and effective.

**Ethical Clearance:** Taken from University ethical committee

**Source of Funding:** Self

**Conflict of Interest:** Nil

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Analysis of the Effect of Access Dimensions and Waiting Times on Satisfaction of Hospital Inpatients Prof. Dr. J.A. Latumen Ambon Level III Hospital

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Abstract

Hospitals are as one of the health facilities to provide health services to the public and have a very important role in accelerating the improvement of the degree of public health. The purpose in this study is to analyze the Influence of Access Dimensions and waiting times on the satisfaction of inpatients at Level III Hospitals Prof. Dr. J.A. Latumen Ambon. The type of research used is quantitative research with cross sectional study design. The population in this study was 37,167 patients in the Inpatient installation in January-October 2019. The data analysis technique used is univariate and bivariate analysis, performed to look for the influence of each free variable with variables bound by using chi-square test. The results showed No accessibility affects the satisfaction of patients in Prof. Dr. J.A. Latumen Ambon Hospital. There is an effect of waiting time on patient satisfaction at Prof. Dr. J.A. Latumen Ambon Level III Hospital. It is very important for Prof. Dr. J.A. Latumen Ambon Level III Hospital to evaluate and improve the patient’s complaints that trigger patients to feel dissatisfied with the hospital service.

Keywords: Access, Waiting Time, Satisfaction, Hospitalization, Hospital.

Introduction

In Indonesia, the health world is experiencing very significant development and has a pretty good prospect. These conditions make the competition more competitive. Therefore, every company engaged in the healthcare industry must be able to use various ways to attract customers through the quality of service¹-². The higher the level of public education causes the public to become more aware of the importance of quality³. People tend to demand better and faster health care. This has led to increasingly intense competition not only between fellow hospitals but also with health centers and health clinics in cities and in increasingly numerous areas⁴. Many healthcare providers are aware of this, so inevitably they have to realize the satisfaction of those customers in various strategies in order to be able to maintain customers⁵.

The quality of service and customer satisfaction were chosen as variables in this study because research on customer satisfaction is very important to research because customer satisfaction is the most often discussed issue in all Hospital patients⁶. Services provided by medical personnel or doctors are an integral part of the
health service in the hospital, which has a very strategic position in an effort to improve the quality of service and satisfaction of consumers or patients coming to the hospital, which results in the satisfaction of the patient, organization or hospital. Hospital Service Satisfaction depends heavily on the customer. If the customer no longer believes in the Hospital because of the poor results, then the Hospital will lose customer trust due to the poor response that was formed.

Hospitals are as one of the health facilities to provide health services to the public and have a very important role in accelerating the improvement of the degree of public health. This requires health care providers, namely hospitals to improve the quality of better services, not only services that are disease-healing but also include preventive services. Therefore, hospitals are required to provide services that are in accordance with established standards and can reach all walks of life.

The quality of hospital services has two components, namely the fulfillment of the quality standards that have been set and the fulfillment of customer satisfaction. Hospitals should provide services that focus on customer satisfaction. Improvement in the quality of health care services can be started by evaluating every element that plays a role in shaping patient satisfaction. The health care system can be improved through clinical pathways, services, including patient perspectives such as how well health care services they need.

Prof.dr. Level III Hospital J.A. Latumen is one of the Basic Health Governing Bodies of the XVI/Pattimura military which has the main task of providing Health services to Indonesian National Army Personnel and Civil Servants of the Indonesian National Army and their families in the ranks of Regional Military Command XVI/Pattimura. Prof. dr. J.A. Latumen Level III Hospital is the highest referral hospital in the Regional Military Command XVI/Pattimura range of lower-level army Health Units. The number of visits of Prof. Dr. J.A. Latumen Ambon Level III Hospital in 2016 was 43,706, in 2017 43,305, in 2018 59,032 and the number of visits in October 2019 was 47,372 visits. from the data, inpatient visits experienced ups and downs. Patient perception of the quality of service with the level of patient satisfaction, especially for patients hospitalized level III Prof. Dr. J.A. Latumen Ambon is very important to improve better service.

The hospital needs to provide services in accordance with the patient’s expectations. Patient satisfaction depends on the quality of service with the appropriate service then the patient’s expectations for the service of a service can be met or even exceeded its expectations, thus causing satisfaction in the patient, the patient’s disappointment will arise if the performance of the health service obtained is not in accordance with the expectations. In achieving patient satisfaction-oriented service objectives, it is important to note that it is important to determine the perception of patient quality, including facilities, the role of doctors, medical personnel and nurses. The purpose in this study is to analyze the influence of access and waiting times dimensions on the satisfaction of inpatients in hospitals level III Prof. Dr. J.A. Latumen Ambon.

**Materials and Method**

The type of research used is quantitative research with cross sectional study design. The population in this study was 37,167 patients in the Inpatient installation in January-October 2019. The samples in his study were calculated using a large sample calculation according to Lameshow so that a large sample of 100 respondents was obtained. Technique of taking a sample using purposive sampling method. Data collection is obtained through interviews using computerized data processing questionnaires using the SPSS program. The data analysis technique used is univariate and bivariate analysis, performed to look for the influence of each free variable with variables bound by using chi-square test.

**Result**

Based on table 1 it is known that the characteristics of respondents based on the most age are the age group of 45 – 54 years and 55 years and above which is 39 people (39.0%). The characteristics of respondents based on the most gender are those with a male gender of 56 people (56.0%). The characteristics of respondents based on the most recent education were those with higher education of 50 people (50.0%)
Table 1: Distribution of Respondents Based on Characteristics of Inpatient Respondents In Prof. Dr. J.A. Latumen Ambon Level III Hospital in 2020

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Amount (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Age Group (yrs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-24</td>
<td>3</td>
<td>3.0</td>
</tr>
<tr>
<td>25-34</td>
<td>6</td>
<td>60.0</td>
</tr>
<tr>
<td>35-44</td>
<td>13</td>
<td>13.0</td>
</tr>
<tr>
<td>45-54</td>
<td>39</td>
<td>39.0</td>
</tr>
<tr>
<td>55+</td>
<td>39</td>
<td>39.0</td>
</tr>
<tr>
<td>b. TypexSex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>56</td>
<td>56.0</td>
</tr>
<tr>
<td>Women</td>
<td>44</td>
<td>44.0</td>
</tr>
<tr>
<td>c. Education.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD/equivalent</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Junior High School/equivalent</td>
<td>11</td>
<td>11.0</td>
</tr>
<tr>
<td>SMA/equivalent</td>
<td>38</td>
<td>38.0</td>
</tr>
<tr>
<td>College</td>
<td>50</td>
<td>50.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2020

Table 2: Frequency Distribution of Research Variables Inpatients at the Hospital In Prof. Dr. J.A. Latumen Ambon Level III Hospital in 2020

<table>
<thead>
<tr>
<th>Research variable</th>
<th>Amount (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affordable</td>
<td>56</td>
<td>56</td>
</tr>
<tr>
<td>Unreachable</td>
<td>44</td>
<td>44</td>
</tr>
<tr>
<td>Waiting time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well</td>
<td>84</td>
<td>84</td>
</tr>
<tr>
<td>Not good</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Satisfaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfied</td>
<td>57</td>
<td>57</td>
</tr>
<tr>
<td>Not satisfied</td>
<td>43</td>
<td>43</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2020

Based on Table 2 shows that of the 100 respondents in Prof. Dr. J.A. Latumen Ambon Hospital, 56 respondents (56.0) with affordable access and as many as 44 respondents (44.0%) with unreachable access. Based on the waiting time variable shows that out of 100 respondents in Prof. Dr. J.A. Latumen Ambon Level III Hospital, 84 respondents (84.0%) provide a good waiting time assessment and as many as 16 respondents (16.0%) the waiting time assessment is not good. Based on satisfaction variables showed that out of 100 respondents at Prof. Dr. J.A. Latumen Ambon Level III Hospital, 57 respondents (57.0%) assessment and 43 respondents (43.0%) who give dissatisfied judgment

Table 3 shows that of the 56 respondents with affordable access, 36 respondents (64.3%) satisfied and as many as 20 respondents (35.7%) expressed dissatisfaction. Meanwhile, of the 44 respondents with unaffordable access, 21 respondents (47.7%) satisfied and as many as 23 respondents (52.3%) expressed dissatisfaction. Statistical test results obtained a value of p = 0.097, since the value p > α = 0.097 > 0.05 then Ho is accepted, this means that there is no statistically meaningful influence of accessibility variables on patient satisfaction in Prof. Dr. J.A. Latumen Ambon Level III Hospital.

Based on waiting time variables shows that of the 84 respondents with a good assessment of waiting time as many as 56 respondents (64.3%) satisfied and as many as 30 respondents (35.7%) expressed dissatisfaction. Meanwhile, of the 16 respondents with poor rating on waiting times, 3 respondents (18.8%) satisfied and as many as 13 respondents (81.2%) expressed dissatisfaction. Statistical test results obtained a value of p = 0.001, because the value p < α = 0.001 < 0.05 then H0 is rejected, this means that there is a statistically meaningful influence of waiting time variables on patient satisfaction in Prof. Dr. J.A. Latumen Ambon Level III Hospital.
Table 3: Results of the Chi Square Test for Research Variables on Inpatient Satisfaction at In Prof. Dr. J.A. Latumen Ambon Level III Hospital in 2020

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patient Satisfaction</th>
<th>Total</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Satisfied</td>
<td>Not satisfied</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Access</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affordable</td>
<td>36</td>
<td>64.3</td>
<td>20</td>
</tr>
<tr>
<td>Unreachable</td>
<td>21</td>
<td>47.7</td>
<td>23</td>
</tr>
<tr>
<td>Waiting time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well</td>
<td>54</td>
<td>64.3</td>
<td>30</td>
</tr>
<tr>
<td>Not good</td>
<td>3</td>
<td>18.8</td>
<td>13</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2020

Discussion

Good access is that health care should be achievable to the community, not hindered by geographical, social, economic, organizational and language circumstances. Geographic access is measured by distance, length of travel, cost of travel, type of transportation, and other physical barriers that can deter a person from getting health care. The access dimension can measure the quality of service about how patients reach the desired health service, whether the access is good or not so from here that will later cause satisfaction in patients.

The location of the hospital where they are undergoing treatment is difficult to access because it feels the distance traveled by far and most respondents already do not have a private vehicle and the language used by health workers is not easy to understand. Meanwhile, respondents who felt good access or service were easily accessible because their location of residence was close to the hospital and already owned a private vehicle.

This research is in line with herman et al research which shows that there is no relationship of quality of service access (affordability) with patient satisfaction ($\rho = 0.057$). Another in line study was conducted balqis et al where the results of the chi square test analysis obtained a value of $p = 0.525$, because the value of $p \geq 0.05$ means it can be concluded that there is no relationship between affordability or access to the quality of service. This research is not in line with this research in line with rivai et al research which highlights the Dimensions of affordability/access to services ($p = 0.177$).

The waiting times in this study include the time that patients use to get health care from enrollment to admission to a doctor or nurse. As the theory of waiting time is the time that patients use to get health care starting from the place of registration to get doctor’s care. The results showed that patients were satisfied with waiting times related to fast file or file preparation skills, user satisfaction that used SIMRS in managing data and providing health care, both in terms of efficiency, effectiveness, satisfaction, but still patients who were dissatisfied with the discipline of doctors who came in was not on time.

Satisfaction of users who use SIMRS in managing data and providing health care, both in terms of efficiency, effectiveness, satisfaction.

His research is in line with research conducted by Laeliyah et al which showed a link between the waiting times for patients in the outpatients and the satisfaction of patients in the hospital’s hospital services, with a score of 0.042. His proves that with long waiting times for outpatient services there will be increasing dissatisfaction with patients’ dissatisfaction with outpatient services, and vice versa.

Conclusion

This study concluded that There is no accessibility effect on patient satisfaction in Prof. Dr. J.A. Latumen Ambon Hospital. There is an influence of waiting time on patient satisfaction at Prof. Dr. J.A. Latumen Ambon Level III Hospital. It is very important for Prof. Dr. J.A. Latumen Ambon Level III Hospital to evaluate and improve the patient’s complaints that trigger patients to feel dissatisfied with hospital services.
Ethical Clearance: Taken from University ethical clearance committee.

Source of Funding: Self

Conflict of Interest: Nil.

References


Evaluation of the Ability Family Planning Center Officers in the Youth Counseling Information Center Program in South Buru Regency

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Abstract

Adolescent problems are very complex problems ranging from large numbers to health risk problems. The purpose of this study to evaluate the ability of Family Planning Center officers in the Youth Counseling Information Center Program in South Buru Regency. This type of research is qualitative analysis. The data collection techniques in this study are indepth interviews and document studies. The informants in this study were divided into 2 sources, namely the key informants in this study as many as 2 people, namely 1 Head of Population control and Family Planning, 1 head of the Program Section of the Youth Counseling Center of South Buru Regency and the usual informant in this study as many as 7 people namely 6 Heads of Family Planning Hall in each sub-district in South Buru Regency, 1 person chairman of youth counseling information center at SMAN 1 Namrole as ambassador representative of Youth Counseling Information Center. The results showed that the ability of youth counseling information center officers in carrying out the Youth Counseling Information Center program in South Buru District is sufficient. To improve the skills and skills of youth counseling information center officers, there is regular training every year at both the district and provincial level. Not every sub-district can participate in training because there is never another invitation to attend training in the district or in the province, thus requiring to seek literature and study self-taught. The government is expected to realize the consistency of training (refreshing) for each district hall officer, centered in the district or in BKKBN Province with professional coaches by inviting all district hall officers so that each officer has the same ability and knowledge.

Keywords: Officer capability, Program, Counseling Information, adolescents, Buru South.

Introduction

Adolescence is one of the fastest phases of human development, according to the World Health Organization, adolescents are those aged 10-19. Adolescent problems are very complex problems ranging from large numbers to problems around adolescent reproductive health. The number of teenagers in the world as of January 2018 is about 1.2 billion people¹. Globally the leading causes of death among adolescents are road injuries, HIV, suicide, lower respiratory tract infections, and interpersonal violence²-³. The problem of adolescents is also a fairly complex problem especially in urban areas. Adolescents face specific health risks, especially those related to reproduction and sexuality. 11% of all births and 14% of maternal deaths worldwide occur in women aged 15 to 19, of which 95% of teen births occur in developing...
Poor, marginalized, and life-losing youth suffer the highest burden of disease, for example, homeless teenagers face a higher risk of HIV infection. Adolescents with disabilities are particularly vulnerable to sexual harassment and the result is unplanned pregnancies and HIV and other sexually transmitted.9-10

Based on Data on Indonesia Population Projection 2000-2025, the proportion of the population of adolescents aged 10-19 years in 2010 was about 18.3% of the total population or about 43 million people.11 The condition of teenagers in Indonesia is currently very concerning. In 2017, the percentage of women and men who smoked before the age of 13 was higher in the 15-19 age group compared to 20-24 years of age, where 27% of women aged 15-19 had started smoking before the age of 13 and 22% in women aged 20-24. 70% of men and 58% of women started drinking alcohol in the 15-19 age group.

However, it found 2% of men and 6% of women started drinking alcohol under the age of 10. Most women (80%) and men (84%) 45% of women and 44% of men start dating between the ages of 15-17. Teenage courtship behavior showed that as many as 8% of men and 2% of women reported having sexual intercourse, arguing that 47% loved each other, 30% were curious/curious, 16% just happened and 3% were forced and influenced by friends. Among women and men who had had sexual intercourse before pre-marriage, 59% of women and 74% of men reported starting to have sexual intercourse first at the age of 15-19 where the highest percentage occurred at the age of 17 both male and female.12

The way to know the performance of the officer in dealing with the problem of the implementation of a program can be done by evaluating the performance of the officer, in the application process or at the end of the application. Performance evaluation is an activity that management does to assess the performance of employees in an organization or company by comparing job descriptions that have been set before.13-14 The purpose of this research is to evaluate the ability of family planning center officers in the youth counseling information center program in South Buru Regency

Materials and Method

The type of research used is a qualitative research method. The data collection techniques in this study are indepth interviews and document studies. The informants in this study were divided into 2 sources, namely the key informants in this study as many as 2 people, namely 1 Head of Population control and Family Planning, 1 head of the Program Section of the Youth Counseling Center of South Buru Regency and the usual informant in this study as many as 7 people namely 6 Heads of Family Planning Hall in each district in Kab. Buru Selatan, 1 person chairman of youth counseling information center at SMAN 1 Namrole as ambassador representative of Youth Counseling Information Center.

Results

The evaluation of the capabilities of the officers referred to in this study is an explanation of the Youth Counseling Information Center program, activities that are already underway in the Family Planning Center related to the Youth Counseling Information Center program, views on the ability of youth counseling information center officers in the Family Planning Center, things that have been taken in improving the ability and skills of youth counseling information center officers in the Family Planning Center.

Based on the results of interviews with informants, it is known that some informants said that the ability of youth counseling center officers is in line with expectations because officers have work experience in the Central Embassy beforehand so have a good understanding of the Youth Counseling Information Center program as well as the access to training. While some informants said it was not as expected because it had never previously socialized to the community so in the beginning it was constrained in communication. Here’s an excerpt from the interview:

“... Family Planning Hall, I must know there is only one family planning doctor Outag Planning Center who is in charge in Leksula Sub-District (IbuLamatokang), the other personnel comes from contractual midwives, civil servants are only a few who come in, so speaking residency (Youth Counseling information center), it’s all empty, only Lamatokang’s mother understands the concept of BKKBN. In terms of a lot of energy, but hr skills are dilemma, I claim to be weak as a pioneer, so from the bottom all look weak.” (KW, 55, Head of Population Control and South Buru)

“... Not fully formed Ambassadors have the ability because there must be maximum training before they counsel personally to their friends or classmates. Honestly gendre action district has never katong
ambassador involved, since I have two years working because it has no transportation cost to the expensive district. Giving certificates to ambassadors, beta submit with their teachers, for the purposes of documentation per monthly report, although the ambassadors I form have not been quite active but they are slowly not as expected.” (AW, 31, Head of Family Planning Center of Kepala Madan Sub-District)

“... Of all family planning field counseling personnel in Namrole sub-district two workers consist of Midwives and Nurses, Wesama Sub-District one midwife, Leksula sub-district one midwife, FenaFafan sub-midwife, One nurse in Madan Head Sub-district, and Ambalau sub-midwife. And only one pure BKKBN power one person from Leksula. Namrole’s best evaluation results, only Namrole has Gendre Ambassadors, for the future plan to be planned to select Gendre Ambassadors in each sub-district.” (NP, 36, Head of Program Section of South Buru District Youth Counseling Information Center)

Other informants said that some youth counseling information center officers were in line with expectations because the ambassador chosen was an accomplished student and often participated in activities in the field. Here’s an interview excerpt:

“... officer’s ability has been slightly in line with expected because all the Youth Counseling Information Center groups that we have shaped all of our achievement categories are not inecuated, so every activity that will be carried out is all involved in the management of their respective work areas until cooperation with cross-sector even they are involved.” (RM, 25, Head of Namrole District Family Planning Hall)

“... Midwives are used to going down in the community if called to get involved, as last month involved the inauguration of Family Village planning on the beach of the village wali.” (AN, 15, Chairman of SMAN 1 Namrole Youth Counseling Information Center)

Based on the results of an in-depth interview between the head of population control and Family Planning, The head of the Youth Counseling Information Center program and head of the Family Planning Center, Chief Madan, said that the ability of youth counseling information center officers in general is still not as expected because some districts are still constrained by access and funding to improve the capabilities of officers, thus requiring 5 Heads of Family Counseling center planning to slowly spur their ability to achieve the expected output, despite equipping themselves with limited literature, but they can form a group of Youth Counseling Information Centers, consisting of high-achieving teenagers, despite only running in 3 subdistricts.

Based on the results of interviews with informants, it is known that in improving the ability and skills of youth counseling information center officers, there is training of Youth Counseling information center or action genre district and provincial level. Training is usually filled by speakers from BKKBN District/Provincial Training Hall through lecture method, q&A and games. The targets in this study were youth counseling information center officers to increase knowledge and awareness through the Adolescent Counseling information center on adolescent reproductive health. Here’s an excerpt from the interview:

“... Training for all staff of the Family Planning Center or Clinic is very rare, so learn more self-taught.” (KW, 55, Head of Population control and family planning of South Buru Regency)

“... Human Resources Counseling field family planning should understand the program so it should love a lot of training from the previous year because this (Youth Counseling information center), must understand this program tiered, advocacy, counseling, and know the truth of the Youth Counseling information center.” (NP, 36, Head of Program Section of South Buru District Youth Counseling Information Center)

“... During 2019 there has never been beta training, except 2018 followed 3 trainings in the province, whereas many additional programs require self-study for additional programs related to youth counseling and kb information centers.” (AW, 31, Head of Family Planning Center of KepalaMadan Sub-District)

“... Skill improvement training so far only in 2018, but sometimes I go to BKKBN Province to participate in training because for the district level has not been penah done, as the only staff in the family planning hall
lekula sub-district completed the program well because it was assisted by the midwife coordinator of lekula health center.” (VL, 55, Head of Family Planning Center Leksula Sub-District)

“... The challenge of the beginning is just, because it is still learning from the field and many helped to see updates from youtube or google. The usual material is prepared about reproductive health, namely knowing the characteristics of puberty, knowing the risk of pregnancy with one sex, and knowledge of Sexually Transmitted Diseases (STDs).” (AN, 15, Chairman of SMAN 1 Namrole Youth Counseling Information Center)

Overall, the ability of youth counseling information center officers in South Buru Regency is sufficient. All eight informants already have a common understanding of the Youth Counseling Information Center program. Youth Counseling Information Center activities have been conducted in each school and village and each already has a group of Youth Counseling information centers although some informants say that they are unable to reach each village to conduct youth counseling information centers because access to locations is quite difficult (sea). To improve the skills and skills of youth counseling information center officers, it should be organized in the planning of district activities but not done. Similarly, the province does not invite participants from all halls in South Buru Regency because there is no proposal from the district. The lack of planning and supervision from province to district and district to each of its halls led to various training programs not running as they should.

Discussion

There are three groups of variables that affect performance and behavior, one of which is individual variables, which include abilities and skills where ability and skill are the main factors that affect individual performance15-21. The ability of officers is seen to assess the extent to which carrying out various tasks in a job is possible and one can get the job well done20. In order to improve their skills and skills, Youth Counseling Information Center officers are given training/action genre districts and provinces every year.although only lekula sub-district family planning center officers have been training in the province since 2019. While other hall officers never participated in youth counseling information center training, because there was never any more invitation to attend training in the district or in the province, thus requiring to seek literature and study self-taught.

This is certainly an evaluation for the officers of the Provincial or District Family Planning Center so that in the future each officer of the District Family Planning Hall gets an invitation to participate in training in the District and Province so that all officers of the District Family Planning Hall get the same opportunity to improve the skills and skills regarding the Youth Counseling Information Center program.

Research conducted by Salla et al shows the ability of officers not to be able and skilled in running the program and some officers do not yet have a registration certificate as a guarantee of the quality of health workers22-23. Human resource quality improvement activities have also been carried out by BPPKB Banyuwangi Regency by holding training for educators or peer counselors, but the training is still not optimal karen not implemented regularly 24-25.

Inadequate resources will create a barrier to policy implementation26-30.outh life is a very decisive life for their next future life. The activities that have been carried out by youth counseling information center officers in South Buru District are (1) establish a counseling information center in the school environment to provide information services and counseling about 8 Family Functions, Marriage Age Maturity, TRIAD KRR, Life Skills, Gender, Advocacy and Communication information and education. (2) Promote and socialize the Youth Counseling Information Center in the community to introduce the existence of youth counseling information center to all relevant parties in order to expand access and development of support and network of youth counseling information centers. (3) Prepare and empower human resources managers of youth counseling information centers to prepare and empower human resources both for the newly grown youth counseling information center and to replace the no longer active human resources with various causes (regeneration) for the continuity of youth counseling information centers. (4) Conduct administration, recording and reporting to improve administrative order and document activities in the management and service provided by the youth counseling information center, including human resources, facilities, infrastructure and method.
Conclusion

This study concluded that the ability of youth counseling information center officers in carrying out the Program of Youth Counseling Information Center in South Buru District is sufficient. To improve the skills and skills of youth counseling information center officers, there is regular training every year at both the district and provincial level. Not every sub-district can participate in training because there is never another invitation to attend training in the district or in the province, thus requiring to seek literature and study self-taught. The government is expected to realize the consistency of training (refreshing) for each district hall officer, centered in the district or in BKKBN Province with professional trainers by inviting all district hall officers so that each officer has the same skills and knowledge.

Ethical Clearance: Taken from University ethical clearance committee

Source of Funding: Self

Conflict of Interest: Nil.

References


Analysis Risk Factors of Stunting Incidence on Toddlers in the Working Area of Porto Haria Public Health Center

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Abstract

The prevalence of stunting events in Central Maluku Regency is still high, with 26 toddlers experiencing stunting in 2018 and 27 in 2019 at Porto Haria Public Health Center. This study aims to analyze the risk factors of stunting events in toddlers in the working area of Porto Haria Public Health Center. This research is a type of analytical observational research with the design of case control study. The case population in this study was a toddler who was diagnosed stunting in the working area of Porto Haria Public Health Center as many as 37 toddlers and the control population in this study was an not diagnosed toddler stunting in the working area of Porto Hariapublic Health Center as many as 814 toddlers. The sampling used purposive sampling and found 72 toddlers were divided into 36 cases and 36 controls. Data analysis using univariate and bivariate statistical analysis using Odds Ratio. The results showed that the immunization of toddlers scored OR=0.680, health care rating OR=0.727, parental education (family head, OR=1.400, Mother’s value OR=0.769). Parental education is a risk factor, while toddler immunization and utilization of health services are protective factors. Parents (Mothers) are advised to pay attention to nutritional intake both during pregnancy and afterwards, in order to monitor the growth and development of children in terms of food and drink. For health care institutions, especially in nutrition health workers are expected to provide more intensive information and education about the dangers and causes of stunting.

Keywords: Stunting, breast milk history, immunization of toddlers, birth weight, Public health center.

Introduction

Stunting is defined as a height index by age less than minus two standard deviations (-2 SD) or below the existing standard average. Stunting in children is a long-term result of chronic consumption of low-quality diets combined with morbidity, infectious diseases, and environmental problems¹-². The high prevalence of stunting in children aged 24-59 months indicates that stunting is unlikely to be reversible³-⁴ so it is necessary to commit from state and local leaders to pay attention to stunting handling in order to lower the prevalence of stunting⁵. Health and stunting are related to politics and culture ⁴-⁹. Health care and stunting actually refer to a setting or regional approach to cover various health problems ¹⁰-¹³.

In Maluku Province, the prevalence of stunting is still volatile from 2016-2018. There was an increase in the prevalence of stunting in 2016 by 29.0% to 30.0% in 2017, however, there was a decrease in the prevalence of stunting toddlers from 30.0% (2017) to 22.9% (2018), although there was still a decrease but there were still 7 districts/cities that experienced an increase in the prevalence of toddler stunting from 2016 to 2017 namely...
West Southeast Maluku regency 25.1% (2016) increased by 31.7% (2017), Southeast Maluku regency 27.8% (2016) increased by 30.0% (2017), Central Maluku Regency 23.2% (2016) 31.4% (2017), Seram West district 23.6% (2016) increased 28.9% (2017), East Seram district 27.4% (2016) mangalami increase 40.6% % (2017), Buru South regency 23.7% (2016) increased by 31.0% (2017), and Tual City 27.4% (2016) increased to 40.6% (2017). There was an increase in the prevalence of toddler stunting in 2 districts/cities from 2017 to 2018, namely Southeast Maluku regency 30.0% increased to 31.4% (2018), and Ambon City 21.9% (2017) increased to 22.0% (2018)14.

The Government of Indonesia is committed to reducing the number of stunting by up to 5% in 2015. Internationally, Indonesia joined the Nutrition Improvement Movement, a global movement with the aim of giving everyone the right to healthy and nutritious food. In September 2012, Indonesia launched a program called “The First 1000 Days of Life Movement” or the First 1000 Days of Life. This movement aims to encourage improved nutrition for a better future for Indonesian children15,16. Public knowledge of the golden age of life or the First 1000 Days of Life needs to be established early, especially for early childhood to improve their understanding in order to become a more qualified generation15.

In order to realize the optimal level of health for everyone, there must be constant attention to the implementation of health-minded national development, the guarantee of health care, improved professionalism and decentralization of the field of health5,17. The main targets of public health services are the community and certain groups. Meanwhile, for public health services, the workers who serve are public health experts. The focus is to prevent disease and the main goal is certainly society as a whole18.

But what happens in the field is still high number of stunting incidents, especially in Central Maluku Regency, Maluku Province. Central Maluku Regency is one of the districts of 3 districts designated by the Ministry of Health as locus stunting. Saparua sub-district is one of 17 sub-districts in Central Maluku district with the number of public health centers as many as 3 public health centers namely Porto Haria public health center, Saparua public health center and BooiPaperu public health center. Porto Haria public health center has 2 working areas namely Porto State and HariaState.

Based on the report of stunting coverage according to the Central Maluku District Health Office in 2018 shows that as many as 26 toddlers experienced stunting in Porto Haria public health center. While the number of stunting incidents in Haria State in 2018 was 23 people out of a total of 157 toddlers, and in 2019 a total of 27 people out of a total of 685 toddlers with details namely babies 0-11 months with a male gender of 58 men and women as many as 47 people, while 1-5 years with male sex as many as 295 men and women as many as 285 people14.

The problem of nutritional status in toddlers in Indonesia has a disparity between regions/provinces. Based on the size of the stunting problem, a region is considered to have mild stunting problems when the prevalence of stunting is between 20-29%, moderate when 30-39% and weight when ≥ 40%19,20. The problem of stunting is one of the problems faced by the world, especially in poor and developing countries. Stunting becomes a health problem because it is related to the risk of pain and death, suboptimal brain development, so that motor development becomes late and inhibits mental growth. This poses a serious threat to the existence of children as the next generation of a nation. Stunting is a poor predictor of the widely accepted quality of human resources, which then degrades a nation’s productive capabilities in the future21.

There are various factors that are the cause of stunting in toddlers. According to Rachmi et al research (2016), some of the risk factors for stunting events stem from child factors such as gender, anthropometry at birth, lactation history and age of complementary food recognition, from parental factors such as parental age, marital status, parental anthropometry such as weight and height, antenatal care history, parental education, and family wealth, as well as from soy factors such as residence, type of residence, caste class, ecological environment, and geographical location22.

The utilization of health services has an influence on stunting events due to the incidence of disease infection (morbidity) closely related to access and utilization of health services. In addition, the health and sanitation services of the environment are also closely related to morbidity and ultimately affect nutritional status23.

Based on the data of toddlers in the working area of Haria public health center there are 62 toddlers from 2 countries in the working area of Porto Haria public health center is a stunting person. This kind of
thing the community needs to get mentoring because the community has not been able to be empowered independently. Problems like this need special treatment and prevention should be carried out early on. Because stunting cannot be cured directly. However, early prevention can lower the risk of stunting in future generations.

Basically there are already programs held by the Public Health Center such as the administration of blood-added tablets in the working area of portoharia public health center. The administration of blood-added tablets is carried out every week precisely on fridays. However, these programs have not had a significant effect in solving stunting problems in the working area of portoharia public health center. This is because the programs are caricature and temporary. The purpose in this study was to analyze the risk factors of stunting events in toddlers in the working area of portoharia public health center

**Materials and Method**

The type of research used in this study is analytical observational research with the design of the Case Control Study. The case population in the study was a toddler diagnosed stunting in the working area of portoharia public health center as many as 37 toddlers and the control population in this study was an undiagnosed toddler stunting in the working area of Porto Haria public health center as many as 814 toddlers. The sampling used purposive sampling and found 72 toddlers were divided into 36 cases and 36 controls. Data analysis using univariate and bivariate statistical analysis using Odds Ratio.

**Results**

Table 1. Distribution of the Characteristics of Research Variables and Stunting Management in the Case and Control Group in the Work Area of the Porto Hariapublic Health Center in 2020

<table>
<thead>
<tr>
<th>Variable Characteristics</th>
<th>Group</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Case</td>
<td>Control</td>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>A. Toddler Immunization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High risk</td>
<td>10</td>
<td>27.8</td>
<td>13</td>
<td>36.1</td>
<td>23</td>
</tr>
<tr>
<td>Low Risk</td>
<td>26</td>
<td>72.2</td>
<td>23</td>
<td>63.9</td>
<td>49</td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>100.0</td>
<td>36</td>
<td>100.0</td>
<td>72</td>
</tr>
<tr>
<td>B. Utilization of Health Services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High risk</td>
<td>3</td>
<td>8.3</td>
<td>4</td>
<td>11.1</td>
<td>7</td>
</tr>
<tr>
<td>Low Risk</td>
<td>33</td>
<td>91.7</td>
<td>32</td>
<td>88.9</td>
<td>65</td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>100.0</td>
<td>36</td>
<td>100.0</td>
<td>72</td>
</tr>
<tr>
<td>C. Parents Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Family Head Parents Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High risk</td>
<td>21</td>
<td>58.3</td>
<td>18</td>
<td>50.0</td>
<td>39</td>
</tr>
<tr>
<td>Low Risk</td>
<td>15</td>
<td>41.7</td>
<td>18</td>
<td>50.0</td>
<td>33</td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>100.0</td>
<td>36</td>
<td>100.0</td>
<td>72</td>
</tr>
<tr>
<td>2. Parenting Education of the child’s mother</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High risk</td>
<td>24</td>
<td>66.7</td>
<td>26</td>
<td>72.2</td>
<td>50</td>
</tr>
<tr>
<td>Low Risk</td>
<td>12</td>
<td>33.3</td>
<td>10</td>
<td>27.8</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>100.0</td>
<td>36</td>
<td>100.0</td>
<td>79</td>
</tr>
</tbody>
</table>

**Source:** Primary Data 2020
Table 1 shows the distribution of respondents based on research variables. Based on the variable immunizations of toddlers in the case and control groups each showed a lower risk of 26 people (72.2%) and 23 (63.9%). Based on the variable utilization of posyandu in the case and control groups each showed more low risk of 33 people (91.7%) and 32 (88.9%). Based on the educational variables parents show for the education of the head of the family in the case group more high risk as much as 21 people (58.3%) and the control group at both low and high risk showed as many as 18 people (50.0%). While the education of parents (Mothers) in the case group and control group each showed a high risk of 24 people (66.7%) and 26 (72.2%).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Case</th>
<th>Control</th>
<th>OR (95% CI, LL-UL)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toddler Immunization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High risk</td>
<td>10</td>
<td>13</td>
<td>0.680</td>
<td>0.449</td>
</tr>
<tr>
<td>Low Risk</td>
<td>26</td>
<td>23</td>
<td>(0.251-1,845)</td>
<td></td>
</tr>
<tr>
<td>Utilization of Health Services</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High risk</td>
<td>3</td>
<td>4</td>
<td>0.727</td>
<td>0.692</td>
</tr>
<tr>
<td>Low Risk</td>
<td>33</td>
<td>32</td>
<td>(0.151-3,510)</td>
<td></td>
</tr>
<tr>
<td>Parents Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Head Parents Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High risk</td>
<td>21</td>
<td>18</td>
<td>1,400</td>
<td>0.478</td>
</tr>
<tr>
<td>Low Risk</td>
<td>15</td>
<td>18</td>
<td>(0.552-3,550)</td>
<td></td>
</tr>
<tr>
<td>Parenting Education of the child’s mother</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High risk</td>
<td>24</td>
<td>26</td>
<td>0.769</td>
<td>0.609</td>
</tr>
<tr>
<td>Low Risk</td>
<td>12</td>
<td>10</td>
<td>(0.281-2,104)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary Data, 2020

Based on Table 2 of health service utilization variables the results of statistical test analysis show that the value of OR=0.727 (CI 95%: 0.151-3,510) means that this variable can only act as a protective factor rather than as a risk factor for stunting events. Similarly, the parental education variables of statistical test analysis show that in the education of parents (head of family) the value of OR=1,400 (CI 95%: 0.552-3550) means that parental education is a risk factor for stunting events. While in parent education (Mother) value OR=0.769 (CI 95%: 0.281-2.104)which means that this variable is a protective factor against stunting events.

**Discussion**

Immunization is the process of inducing artificial immunity both by vaccination (active immunization) and by administering antibodies (passive immunization) (Peter, 2003). Immunization in children has an important goal which is to reduce the risk of morbidity (pain) and mortality (death) of children due to diseases that can be prevented by immunization. The OR scores obtained show that this is in line with research conducted by Swathma, Lestari & Ardiansyah (2016) showing that most toddlers have received complete basic immunizations in both the case group and the control group.

Toddler immunization can play a protective role in stunting. It also means that toddlers with good or complete immunizations can reduce the risk of stunting. The OR scores obtained show that this is in line with research conducted by Swathma et al (2016) showing that most toddlers have received complete basic immunizations in both the case group and the control group. Similarly, research conducted by Azrizul et al (2018) shows that...
toddlers who do not get fully immunized are more at risk of stunting because immunization is one way of preventing infectious diseases, especially PD3I given to both infants and adults. However, complete immunization does not guarantee a person not to experience the disease as it can be affected by the benefits and effectiveness of immunizations such as the quality of the given vaccine. Therefore, either a fully immunized or incomplete child has the same opportunity to experience stunting.

The cause of the onset of nutritional problems is multifactor consisting of direct and indirect factors. Therefore, basic health service efforts are directed towards improving the health and nutritional status of children so as to avoid early death and low physical quality in the utilization of health services is not separated from the efforts of health officials to encourage the public in order to socialize the activities that exist in the health service both health promotion efforts, disease prevention, treatment and recovery of health.

Conclusion
The study concluded that the immunization of toddlers is a protective factor against stunting events in the working area of Portoharia public health center. Toddlers with the utilization of health services are protective factors of stunting events in the working area of Porto Haria community health center. Variable parental education (parental education-head family is a risk factor, while parent-mother education is a protective factor in the occurrence of stunting events in the working area of Porto HariaPublic health center. Parents (Mothers) are advised to pay attention to nutritional intake both during pregnancy and afterwards, in order to monitor the growth and development of children in terms of food and drink. For health care institutions, especially in nutrition health workers are expected to provide more intensive information and education about the dangers and causes of stunting.

Ethical Clearance: Taken from University ethical clearance committee.

Source of Funding: Self

Conflict of Interest: Nil.

References


Study of Covid 19 Occurrence in Relation to Masks and Hand Sanitizers Use

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Abstract

Covid-19 is an infectious disease that has the potential to cause a public health emergency. Therefore, preventive measures against these types of infectious diseases must be carried out as soon as possible. Indonesia as a rule of law, therefore the prevention of these types of infectious diseases must be established in a rule or regulation. The purpose of this literature review is to describe an intervention regarding the use of masks and hand sanitizers against the incidence of Covid 19. The database searches used include ProQuest, SciVerse Science Direct, Scopus, Pubmed, Cochrane library, Springer and Sci-hub. Keywords used in the search for articles were mask, hand sanitizer, preventive, COVID-19. There are 18 journal articles obtained through objective analysis, topic suitability, research method used, sample size, research ethics, the results of each article, and the limitations that occur. There have been effective results in implementing the distribution of covid 19 events related to the use of masks and hand sanitizers. There have been effective results in using masks and hand sanitizers against the incidence of covid-19

Keywords: Covid 19, masks, hand sanitizer.

Introduction

The Indonesian government has declared a disaster emergency status related to this virus pandemic. The government made a policy to implement physical distancing to decide the spread of covid 19. People are advised not to make direct contact with other people, avoid mass gatherings. Work, study and worship activities are carried out at home¹. Current information indicates that the two main modes of transmission of the COVID-19 virus are respiratory droplets and contact. Respiratory sprays are generated when a person coughs or sneezes. Anyone who is in close contact (within a radius of 1 m) with a person who shows symptoms of respiratory distress (coughing, sneezing) is at risk of exposure to respiratory tract splashes that could possibly cause infection (infectious). Splashes can also fall onto surfaces on which the virus remains active; therefore, the immediate environment of an infected person can be a source of transmission (contact transmission).²,³

The mechanism that occurs is by capturing particles or aerosols from the air with a filtering or absorption method, so that the air that passes through the mask is clean from particulates⁴. Prevention of transmission of Covid19 to the community is carried out with various efforts. Based on the health protocol issued by the WHO, the government instructs the public to always wash their hands with soap in running water, and always wear a mask when outside the home. Why wear a mask? A recent study by the Standing Commission for Infectious Diseases and 21st Century Threats in the United States
said that COVID-19 can be transmitted through normal conversation and breathing with an exposed person. Based on the research, the Ministry of Health (2020: 2) explained that this disease can be spread through small droplets from the nose or mouth when coughing or sneezing. The droplet then falls on the surrounding object.

Masks are necessary for everyone so that they do not spread the virus to each other because this virus is transmitted between humans and humans and spreads very quickly. A high chance of transmission can occur when exposed people interact with healthy people and healthy people interact with other people and so on. Seeing the current tense situation, namely the Covid-19 pandemic that has occurred throughout the world, it is necessary to make efforts to prevent the spread of the corona virus. Thus the Community Service team felt the need to carry out activities to break the distribution chain of Covid-19 by distributing free masks and hand sanitizers to the Manggarai community in the Puni Ruteng market, Manggarai Regency.

Hand-saitizer is a product in the form of a gel that contains an antiseptic as a hand sanitizer which, if used, does not need to be rinsed with water. Using it is very effective at killing transient and resident flora compared to using water, using ordinary soap or antiseptic soap. FDA) that hand-sanitizers can kill germs in less than 30 seconds\(^5\). The purpose of this activity is to make the public aware of the importance of health in this pandemic situation, always wash their hands with soap, use a hand sanitizer and wear a mask to stop transmission of the virus to others.

Materials and Method

The method used in this review literature uses a comprehensive strategy, such as searching for articles in research journal databases, searching through the internet, reviewing articles. The database searches used included ProQuest, SciVerse ScienceDirect, Scopus, Pubmed, Cochrane library, Springer and Sci-hub. The keywords used in the search for the article were the study of covid 19, health promotion, use of masks, use of handsanitizers and Covid 19. There were 18 journal articles and were analyzed through objective analysis, topic suitability, research method used, sample size, research ethics, results. of each article, as well as the limitations that occur.

**Results**

**Table 1. Distribution of Covid 19 occurrence base on the reviewed articles**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Title</th>
<th>Sample</th>
<th>Method</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Chi-Chung, 2020)(^6)</td>
<td>The role of community-wide wearing of face mask for control of coronavirus disease 2019 (COVID-19) epidemic due to SARS-CoV-2</td>
<td>100</td>
<td>Epidemiology Analysis</td>
<td>In the first 100 days (31 December 2019 to 8 April 2020), 961 COVID-19 patients were diagnosed, nosed in HKSAR. The incidence of COVID-19 in HKSAR (129.0 per million population) was significantly lower (p &lt;0.001) than Spain (2983.2), Italy (2250.8), Germany (1241.5), France (1151.6)), USA (1102.8), UK (831.5), Singapore (259.8), and South Korea (200.5).</td>
</tr>
<tr>
<td>(E, et al., 2020)</td>
<td>To mask or not to mask: Modeling the potential for face mask use by the general public to curtail the COVID-19 pandemic</td>
<td>Eksperimental study</td>
<td>Our results suggest the use of face masks by the general public is potential of high value in limiting community transmission and the burden of the pandemic.</td>
<td></td>
</tr>
<tr>
<td>(Wang, Pan, Tang, &amp; Shi, 2020)(^7)</td>
<td>Mask use during COVID-19: A risk adjusted strategy</td>
<td>Efektivity Study</td>
<td>This study 1) describes the transmission route of Coronavirus 2 Severe Acute Respiratory Syndrome (SARS-CoV-2); 2) addresses the controversy surrounding masks from the perspective of attitudes, effectiveness, and the necessity of wearing masks with evidence that the use of masks will effectively stop transmission of infectious diseases both in the hospital setting and in the setting community; and 3) recommends that people wear masks during the COVID-pandemic according to the local context.</td>
<td></td>
</tr>
</tbody>
</table>
Based on the results of articles and journals that were collected and the author’s analysis, it was found that there was a relationship between the use of masks and hand sanitizers to the Covid 19 incident. The behavior of wearing a mask and hand sanitizer when doing activities is an effort in the form of preventing the occurrence of covid transmission 19.

**Table 2. The occurrence of Covid-19 base on the literature review**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Title</th>
<th>Sample</th>
<th>Method</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Lyu &amp; Wehby, 2020)&lt;sup&gt;8&lt;/sup&gt;</td>
<td>Community Use Of Face Masks And COVID-19: Evidence From A Natural Experiment Of State Mandates In The US</td>
<td>Experience difference design</td>
<td>There was a significant decrease in daily COVID-19 growth rates after mandating face coverings in public, with the effect increasing over time after the order sign. Specifically, daily case rates fell by 0.9, 1.1, 1.4, 1.7, and 2.0 percentage-points of age in 1–5, 6–10, 11–15, and 16–20, and 21+ days after signing, respectively.</td>
<td></td>
</tr>
<tr>
<td>(Saadat et al., 2020)&lt;sup&gt;9&lt;/sup&gt;</td>
<td>Environmental perspective of covid-19 <a href="https://doi.org/10.1016/j.scitotenv.2020.138870">https://doi.org/10.1016/j.scitotenv.2020.138870</a></td>
<td></td>
<td>Many think that there is an upside; that the spread of the virus has reduced air and water pollution and perhaps even saved lives in this process. Public action to humiliate people Transmission of COVID-19 to people needed to control the flow Epidemic has also changed people’s lifestyles; causing extensive job losses and threatening the survival of millions, as businesses close down to control the spread of the virus.</td>
<td></td>
</tr>
<tr>
<td>(Nuraeni, Malinti, &amp; Elon3, 2020)&lt;sup&gt;10&lt;/sup&gt;</td>
<td>Preparedness of youth in the face of the covid-19 outbreak</td>
<td>Deskriptive Study</td>
<td>Research has reflected a sense of adolescent care to prevent and stop the spread of covid-19. Efforts that can be made to deal with Covid 19 are to continue to do physical distancing, diligently wash their hands, use masks when leaving the house, and carry out their obligations as students to study at home online.</td>
<td></td>
</tr>
<tr>
<td>(Sii, Filomena, Effrem, Klaudia, &amp; Nesi, 2020)&lt;sup&gt;14&lt;/sup&gt;</td>
<td>A form of concern for fighting Covid-19 through the distribution of 5,000 masks and hand sanitizers to the public in the Puni Ruteng - Manggarai market</td>
<td>Distribution of masks to all people regardless of age, and hand sanitizers are only distributed specifically to travel drivers</td>
<td>As a result, this activity was able to provide awareness to the public about the importance of maintaining health and overcoming the spread of Covid-19 in Manggarai Regency in general.</td>
<td></td>
</tr>
<tr>
<td>(Meri, Khusnul, Suhartati, Mardiana, &amp; Nurnalalah, 2020)&lt;sup&gt;15&lt;/sup&gt;</td>
<td>Community empowerment in the use of hand sanitizers and masks as a preventive effort against Covid-19</td>
<td>Community education</td>
<td>The results obtained are that 100 target people have received handsanitizers and 200 people have received masks. Thus, the surrounding community can finally use masks and supplies of handsanitizer when leaving the house.</td>
<td></td>
</tr>
<tr>
<td>(Ester, 2020)&lt;sup&gt;16&lt;/sup&gt;</td>
<td>The incidence of corona virus disease 2019 is based on population density and altitude per sub-district</td>
<td>Journal of Public Health and community Medicine</td>
<td>The results of this study indicate that most sub-districts in the city of Manado are in the medium category for COVID 19, medium and high for population density and medium for the altitude category.</td>
<td></td>
</tr>
<tr>
<td>(Moudy &amp; Adlia, 2020)&lt;sup&gt;17&lt;/sup&gt;</td>
<td>Knowledge related to efforts to prevent coronavirus disease (covid-19) in Indonesia</td>
<td>observasional analitik dengan desain cross-sectional</td>
<td>There is a significant relationship between knowledge and attitude (p = 0.000) and knowledge with individual actions (p = 0.000). Efforts to prevent COVID-19 are influenced by the knowledge of the Indonesian people.</td>
<td></td>
</tr>
</tbody>
</table>
Table 3. Distribution of Covid 19 occurrence base on the reviewed articles

<table>
<thead>
<tr>
<th>Authors</th>
<th>Title</th>
<th>Sample</th>
<th>Method</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Theopilus, Yogasara, Theresia, &amp; Octavia, 2020)</td>
<td>Risk analysis of personal protective equipment products Prevention of covid-19 transmission for informal workers in Indonesia</td>
<td>15 aspect</td>
<td>Failure Mode and Effect Analysis (FMEA)</td>
<td>The analysis results, obtained a total of 10 mask risks, 15 face shield risks, and 11 glove risks that need to be considered by informal workers as well as PPE designers and producers.</td>
</tr>
<tr>
<td>(Ester, 2020)</td>
<td>The incidence of corona virus disease 2019 is based on population density and altitude per sub-district</td>
<td>Observasional</td>
<td></td>
<td>The results of this study indicate that most sub-districts in the city of Manado are in the medium category for COVID 19, medium and high for population density and medium for the altitude category. Furthermore, based on population density, the higher the density, the higher the incidence of COVID 19.</td>
</tr>
<tr>
<td>(Pramita, Sholihah, &amp; Atiqoh, 2020)</td>
<td>The relationship between public knowledge and compliance with the use of masks as an effort to prevent Covid-19 in ngronggah</td>
<td>62</td>
<td>Quantitative with cross sectional approach</td>
<td>Based on the results of the Chi-Square test, the significance of the independent variables, namely public knowledge with the dependent variable of compliance with the use of masks, is 0.004 (p &lt;0.05), so Ho is rejected and it is stated that there is a relationship.</td>
</tr>
<tr>
<td>(Sukesih, Usmanb, Budi, &amp; Nur, 2020)</td>
<td>Knowledge and attitudes of health students about covid-19 prevention in Indonesia</td>
<td>444</td>
<td>Survey analytic</td>
<td>The results of the research on the knowledge questionnaire were highest in the good category as many as 228 (51.35%) while the highest attitude was in the good attitude category were 206 (46.39%).</td>
</tr>
</tbody>
</table>

Discussions

Some efforts are made by the government through the covid-19 control team and health team to reduce the risk of contracting the corona virus, among others; remind the public to maintain health by washing hands after making contact with anyone in flowing water, consuming vitamins that can increase endurance, quarantining people suspected of being infected with the corona virus, wearing masks when they are outside the home and in places -public places, maintain distance, and do not make direct contact with other people.

This is consistent with research conducted by WHO on influenza, influenza-like illness (influenza-like illness), and coronavirus in humans providing evidence that the use of medical masks can prevent the spread of splashes that can cause infection from an infected person to another. and possible environmental contamination from these splashes. Evidence that the use of medical masks by healthy people inside the home or by people who have contact with patients, or by people in large gatherings serves as a preventive function is limited. Research by (Moudy & Adlia, 2020) states that the correct use of masks is known by almost all respondents, namely masks are worn with a position to completely cover the nose, mouth and chin (96.6%), and throw away the masks that have been used (79.7 %). More than half of the respondents know that if the mask is wet or dirty, it must be replaced immediately (75.1%) and wash their hands after removing the mask (59.4%). Only a small proportion of respondents chose the wrong option, namely touching the front surface of the mask while wearing it and taking it off (14.1%), and using one disposable mask repeatedly (13.5%).

Research by Rivai, Ayini S, Yesintha states that Hand sanitizer is a product that can clean hands that contain an antiseptic in the form of a gel which when used to wash hands no longer need to rinse with water. Alcohol-based products, which include almost all “disinfectant” products, contains a high percentage alcohol solution (usually 60-80% ethanol) and kills viruses in a similar way. But soap is better because it requires only a small amount of soapy water, which, by rubbing, covers the entire hand easily.22-28
Conclusion

The relationship between the use of masks and hand sanitizers to the incidence of Covid 19. Covid-19 is an infectious disease that has the potential to cause a public health emergency. Therefore, preventive measures against these types of infectious diseases must be carried out as soon as possible. Indonesia as a rule of law, therefore the prevention of these types of infectious diseases must be established in a rule or regulation. Prevention of transmission of Covid-19 in the community is carried out with various efforts. Based on the health protocol issued by the WHO, the government instructs the public to always wash their hands with soap in running water, and always wear a mask when outside the home. In addition, the use of hand sanitisers that contain antiseptics as hand sanitizers, which if you do not need to be rinsed with water, are very effective in killing transient and resident flora compared to using water, using ordinary soap or antiseptic soap.

Ethical Clearance: Taken from University ethical clearance committee

Source of Funding: Self

Conflict of Interest: Nil.

References


Analysis Influence of Characteristics and Knowledge of Health Workers on the Management Public Health Centers in Ambon City of Maluku Province

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¹Magister Student Program Department of Health Administration and Policy, Public Health Hasanuddin University, ²Professor of Department of Health Administration and Policy, Public Health Hasanuddin University, ³Professor of Department of Environmental Health, Public Health Hasanuddin University, ⁴Departmentnt Biostatisticsc, Public Health Hasanuddin University

Abstract

The knowledge of each individual in the organization is definitely different so the cause of knowledge does not develop evenly with in the organizational environment. The purpose of this study is to analyze the influence of health workers capacity based on the characteristics and knowledge of health workers on the management of public health centers. The type of research used is quantitative research with cross-sectional study design. The population in this study is the entire Head of public health center, Head of Administrative and Program Manager of public health center in Ambon City year 2020 which numbered 143 people. The samples in this study used non-random sampling/non probability sampling techniques, namely purposive sampling, the sample set out in this study amounted to 44 health workers namely the Head of public health center and Head of Governance in Ambon city public health center in 2020. The data analysis techniques used are univariate analysis and bivariate analysis conducted to look for the influence of each free variable with variables bound using chi-square test. The results of this study show that Knowledge Based Health Capacity affects the health management of all public health centers in Ambon City. It is recommended that trainees be able to add insight into planning knowledge (P1), implementation (P2), and assessment (P3) of community health center management and develop the implementation of community health center management obtained at the training site

Keywords: Knowledge, Management of public health centers, Ambon.

Introduction

In an effort to improve the degree of public health as mandated by the above law, health workers who have the capacity of competence and professionalism in their field so as to be able to apply the knowledge and knowledge that it has in health services to the public. Law No. 36 of 2014 on Health Workers states that Health Workers are everyone who devotes themselves in the field of health and has knowledge and/or skills through education in the field of health which for some kind requires the authority to conduct health efforts¹.

The health workers intended above are medical personnel, clinical psychologists, nursing personnel, obstetricians, pharmaceutical workers, public health workers, environmental health workers, nutritionists, physical therapists, medical engineering personnel, biomedical engineering personnel, traditional health workers, and other health workers. According to the Indonesian Dictionary (KBBI) the capacity is the
The Center for Public Health as one of the first types of health care facilities that have an important role in the national health system, especially the sub system of health efforts. In the approach of solving health problems public health centers are as a micro setting that requires collaboration with other sectors. A public health center is a health care facility that organizes public health efforts and first-rate individual health efforts, with promotive and preventive efforts in priority, to achieve the highest level of public health in its working area. Various health problems can actually be addressed at the highest level of public health in its working area. The knowledge of each individual in the organization is definitely different so the cause of knowledge doesn't develop evenly with in the organizational environment. Knowledge Management is one of the solutions to help with knowledge processing, so that individuals in training or learning classes can be just as knowledgeable. Understanding the importance of public health center management in the regulation of the minister of health no. 44 of 2016 has previously been introduced since 1980–2015, with the drafting of the Guidelines management of public health centers.

Public health centers have the task of carrying out health-minded development in their working areas in order to support the realization of healthy sub-districts. The success of the implementation of the task of the public health center depends heavily on the management of existing resources including human resources (Health Workers) as health care providers to the public. Public health center is a First Level Health Facility responsible for organizing public health efforts and individual health efforts in its working area (Regulation of the minister of health 7 on public health centers). In order for public health centers to carry out health efforts properly and sustainably in achieving their goals, the first must be done public health centers are: 1) Develop planning (P1) programs and activities of public health centers based on pdca cycles (plan,do,check,action) according to Decree 44 of 2016 on the management of public health centers) as well as the cycle of budgeting planning that exists in the area, 2) Carry out the mobilization and implementation of activities (P2) through The Monthly Mini Workshop and Tri Monthly public health center in accordance with the plan of activities/programs prepared later, 3) conduct supervision, control and assessment of the performance of public health centers (P3) followed by efforts to improve and improve the quality of public health centers.

Materials and Method

The type of research used is quantitative research with cross sectional study design. The population in this
study is the entire Head of public health center, Head of Administrative and Program Manager of public health center in Ambon City in 2020 which numbered 143 people. The samples in this study used non random sampling/non probability sampling techniques, namely purposive sampling, the sample set out in this study amounted to 44 health workers namely the Head of public health center and Head of Governance of public health center in Ambon City in 2020. The data analysis techniques used are univariate analysis and bivariate analysis conducted to look for the influence of each free variable with variables bound using chi-square test.

Results

Table 1 shows that of the 44 respondents based on the most age in the age group - 34 (77.3%) and the least number of respondents in the age group ≥ 50 years is 10 people (22.7%), based on gender indicating that of the 44 respondents based on the most gender are respondents with a female gender of 35 people (79.5%) while the least male sex is 9 (20.5%). Based on the position shows that of the 44 respondents based on the position consisting of two types of positions, namely the Head of public health center and head of administrative with the same result as 22 people (50%) each

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Amount (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Age Group (yrs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;50 years</td>
<td>34</td>
<td>77.3</td>
</tr>
<tr>
<td>≥ 50 years</td>
<td>10</td>
<td>22.7</td>
</tr>
<tr>
<td>b. Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>9</td>
<td>20.5</td>
</tr>
<tr>
<td>Women</td>
<td>35</td>
<td>79.5</td>
</tr>
<tr>
<td>c. Position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head of community health center</td>
<td>22</td>
<td>50</td>
</tr>
<tr>
<td>Head of administration</td>
<td>22</td>
<td>50</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2020

Table 2 shows that of the 44 respondents, based on the most knowledge variables are respondents with sufficient knowledge of 23 people (52.3%) and the least knowledge is less than 21 people (47.7%). Based on the variable management of public health centers shows that out of 44 respondents, based on the management of public health centers the most are respondents with sufficient management of 31 people (70.5%) and the least classified management is 13 people (29.5%)

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Amount</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enough</td>
<td>23</td>
<td>52.3</td>
</tr>
<tr>
<td>Less</td>
<td>21</td>
<td>47.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Management Community Health centers</th>
<th>Amount</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enough</td>
<td>31</td>
<td>70.5</td>
</tr>
<tr>
<td>Less</td>
<td>13</td>
<td>29.5</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2020

Effect of Health Personnel Capacity based on Knowledge on Public Health Center Management All public health centers in Ambon City

The influence of knowledge variables on the management of public health centers can be seen in the table as follows.

Table 3 shows that of the 21 respondents who were classified with less knowledge as much as 11 respondents (52.4%) management capabilities of public health centers and as many as 10 respondents (47.6%) management capabilities of public health centers. While of the 23 respondents who are classified with enough knowledge as much as 2 respondents (8.7%) management capabilities of public health centers and as many as 21 respondents (91.3%) with sufficient public health center management capabilities. Statistical test results using Chi-Square test with Fisher Exact test obtained p-value value = 0.002, because the value p<α = 0.002 > 0.05 then Ho was rejected, this means that there is a statistically meaningful influence between the capacity of health workers based on knowledge of the management of public health centers throughout the community health center in Ambon City.
**Table 3** The Influence of Knowledge on Management Public Health centers throughout Public Health centers Ambon City in 2020

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Management Community Health Centers</th>
<th>Amount</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Enough</strong></td>
<td><strong>Less</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Enough</td>
<td>21</td>
<td>91.3</td>
<td>2</td>
</tr>
<tr>
<td>Less</td>
<td>10</td>
<td>47.6</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>70.5</td>
<td>13</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2020

**Discussion**

Knowledge is the result of knowing and this happens after people do sensing a particular object. The process of seeing, witnessing, experiencing, or being taught determines the event of knowledge in a person. Knowledge is a very important factor for the formation of an over behavior. Because if someone doesn’t know about an object, it won’t appeal to someone. The same is the case with the capacity level of health workers.

The knowledge of a person can be obtained both from experience and from the educational bench which is the basis of one’s insight as well as a means to facilitate a person who receives new knowledge and behaviors of the level of formal education that one has ever obtained will increase the knowledge of his or her reasoning.

Knowledge is also influenced by the level of education. Yava et al (2013) states that health workers with higher levels of master’s degree education and health workers with a bachelor’s degree have significantly higher statistical knowledge scores than high school graduate health workers; health workers who have taken postgraduate pain management programs have significantly higher statistical knowledge scores than those who do not; similarly, health workers who read books or journals about their disciplines have significantly higher knowledge scores than others.

Knowledge of Regulation of the Minister of Health of the Republic of Indonesia No. 44 of 2016 on The Management Guidelines of public health centers can affect the behavior of health workers in increasing the capacity of public health center services to improve health management.

Knowledge is very important in providing insight into the form of attitudes, which will then be followed by actions in choosing health services that are believed to be capable. The level of knowledge has an influence on the management of public health centers. If health workers do not know about the majemen of public health centers that are good and correct, then in the implementation of public health center services will be irregular. Knowledge is everything that happens in one’s daily life. Attitude is one’s readiness or willingness to act and is not an execution of a particular motive. In other words the function of attitude is not yet an action or activity, but is a predisposition of behavior or action. This indicates that the domain of behavior is a unit of knowledge, attitude and action (activity).

Research conducted by Yusraa shows that the year has an effect on the utilization of elderly posyandu (p = 0.000 < 0.05), other research conducted by asyara et al (2020) shows Knowledge Management and Service Leadership have a positive and significant effect on the Quality of Service.

The level of individual knowledge will have a profound effect on awareness to increase capacity in health and have an impact on behavior. But when further analyzed the process of forming an awareness is not only influenced by his knowledge.

Knowledge alone is not enough to make someone change their behavior. Behavior change or adoption is a complex process and takes a relatively long time. In theory, a person’s behavior changes to accept or adopt new behaviors in his or her life through three stages, namely the knowledge that before a person adopts a behavior (new behavior), he must know in advance what the meaning or benefit of the behavior is to himself or his family, the attitude that is after a person knows the
stimulus or object, the next process will assess or behave against the stimulus or health object, the practice or action that is after a person knows the stimulus or health object, then conducts an assessment or opinion on what is known or behaved$^{10,29-32}$.

**Conclusion**

This research concluded that Knowledge Based Health Capacity affects the health management of all public health centers in Ambon City. Recommended to trainees can add insight into planning knowledge (P1), implementation (P2), and assessment (P3) of public health center management and develop the implementation of community health center management obtained at the training site.

**Ethical Clearance:** Taken from University ethical clearance committee

**Source of Funding:** Self

**Conflict of Interest:** Nil.

**References**


Effects of Different Antihypertensive Drugs on Systolic and Diastolic Blood Pressure, Heart Rate and Lipid Profile

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Abstract

Background: Hypertension (HTN) is a chronic medical condition in which the systemic arterial blood pressure is elevated. AIM OF STUDY: The present study compared the effects of atenolol, enalapril and amlodipine on diastolic and systolic pressure & heart rate in hypertension and effects on serum lipid were also assessed.

Patients and Method: A total of 200 patients with hypertension and 100 normotensive controls. The hypertensive patients were randomly allocated into three groups each of 100 patients and were treated with either atenolol (50-100 mg) or enalapril (10-20mg) or amlodipine (5-10 mg) for three months.

Results: Patients taking atenolol showed a significant reduction of SBP, heart rate, while the group taking enalapril showed a significant reduction of SBP, DBP, and no significant change in heart rate while with amlodipine showed a significant decreases of SBP, DBP whereas the change in heart rate was not significant on ther hand Amlodipine was significantly better than atenolol and enalapril at reducing total cholesterol level. Amlodipine was significantly better than atenolol and enalapril at reducing LDL cholesterol level .Enalapril was significantly better than amlodipine and atenolol at increasing serum HDL level . Discussion In this study There was no significant change in heart rate in patients taking, enalapril, or amlodipine while the heart rate was significantly reduced by atenolol. On other hand the enalapril treated group a significant increase of HDL cholesterol. The favorable lipid changes observed with a mlodipine, a significant decreases of total cholesterol and LDL cholesterol levels.

Conclusions: The systolic and diastolic BP values were significantly reduced after, atenolol, enalapril, or amlodipine therapy. There was no significant change in heart rate in patients taking, enalapril, or amlodipine which is consistent with that reported else On the other hand heart rate was significantly reduced by atenolol. on other hand amlodipine are to be preferred in hypertensive patients with elevated LDL-cholesterol levels and enalapril is valuable in hypertensive patients with low HDL-cholesterol levels.

Keywords: Anti-hypertention medication, lipid profile, Heart rate.

Introduction

Hypertension (HTN) or high blood pressure is a chronic medical condition in which the systemic arterial blood pressure is elevated. It is the opposite of hypotension. It is classified as either primary (essential) or secondary. About 90–95% of cases are termed “primary hypertension”, which refers to high blood pressure for which no medical cause can be found ¹. The remaining 5–10% of cases (Secondary hypertension) are caused by other conditions that affect the kidneys, arteries, heart, or endocrine system², hypertension is defined as a systolic blood pressure of 140 mm Hg or higher and/or diastolic
blood pressure of 90mm Hg or greater. When the systolic blood pressure ranges between 140-159 and the diastolic blood pressure ranges between 90 – 99, hypertension is considered mild.

Moderate hypertension is labeled when the systolic blood pressure ranges from 160 – 179 and diastolic blood pressure ranges from 100-109. When the systolic blood pressure is ≥ 180 and diastolic blood pressure is ≥ 110 it is considered as severe.

Antihypertensive drug treatment with special reference to the drugs used in this study: Calcium Channel Blockers (Amlodipine) is a dihydropyridine calcium antagonist (calcium ion antagonist or slow-channel blocker) that inhibits the transmembrane influx of calcium ions into vascular smooth muscle and cardiac muscle. Amlodipine inhibits calcium ion influx across cell membranes selectively, with a greater effect on vascular smooth muscle cells than on cardiac muscle cells. Angiotensin Converting Enzyme Inhibitors (ACEI): provide multiple benefits to the heart without the potential of any adverse effect on the heart. The benefits of ACE inhibitors include the greatest degree of LVH regression, improvement in coronary flow reserve improvement in coronary vasomotor responses relief of angina in some patients. In addition reduction of mortality following myocardial infarction and inhibition of atherosclerosis in animal models. Enalapril is effective in promoting regression of LVH in hypertensive patients and improving LV diastolic function. Beta blockers: are reducing the overall morbidity and mortality in patients with hypertension. Moreover they are effective in promoting LVH regression in hypertensive patients. Atenolol is a beta selective adrenoceptor blocker that is appropriate for initiation as well as subsequent therapy for all degrees of hypertension, documented that atenolol to be effective in causing regression of LVH in hypertensive patients and improve LV diastolic function. Aims of the study: The present study was undertaken to assess and compare the effects of the beta1-adrenoceptor blocker (atenolol), the angiotensin converting enzyme inhibitor (enalapril) and the calcium channel blocker (amlodipine) monotherapy in patients with mild-moderate hypertension, Changes in serum lipid profile.

Patients and Method

Two hundred consecutive hypertensive patients (average age 50±15 years) and one hundred normotensive controls (55± 15 years) attending the teaching hospital IBN ALNAFEES CARDIOVASCULAR TEACHING HOSPIT in BAGHDAD city/Iraq in the period between 2018 and 2020 were included in this study. In all patients, supine BP was measured by a mercury sphygmomanometer using the first and fifth Korotkoff sounds to identify systolic and diastolic values, respectively. The average of three measurements was used as the clinic blood pressure. Patients included in the study were allocated randomly into 3 equal groups each of 300 patients as: Group I received atenolol tablet 4 (50-100 mg once daily). Group II received enalapril tablet Enopril, (10-20 mg once daily). Group III received amlodipine tablet amlong, (5-10 mg once daily). The drug doses were titrated to keep blood pressure consistently below 140/90. These patients together with the normotensive controls were studied and followed for 3 months. Hypertensive patients and the normotensive controls. Biochemical studies: The following biochemical tests were performed for each patient at the initial visit and repeated after the study period: serum lipid profile including total cholesterol, LDL cholesterol, HDL cholesterol, and serum triglycerides.

Results

Two hundred hypertensive patients and one hundred normotensive controls were enrolled into the study. A number of the above mentioned hypertensives and controls discontinued the study with out an obvious, sixty five patients treated with atenolol (44 M and 21 F), sixynet patients treated with enalapril (44 M and 21 F), eighty patients treated with amlodipine (60 M and 20 F) and eighty five control (77 M and 8 F) The mean age of hypertensive patients was 50 ± 15 years versus 50±15 years in the control group. Baseline serum lipid levels showed a significantly higher total cholesterol levels, and a significantly less HDL cholesterol levels in hypertensive patients as compared to normotensive controls.

Effects of treatment on blood pressure, heart rate: Patients taking atenolol showed a significant reduction of SBP, heart rate & see Table (1) figure (1,2,3).
Table (1): Effects of atenolol, enalapril, amlodipine on blood pressure, heart rate.

<table>
<thead>
<tr>
<th>Blood pressure &amp; Heart rate</th>
<th>Atenolol (50-100 mg daily)</th>
<th>Enalapril (10-20 mg daily)</th>
<th>Amlodipine (5-10 mg daily)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before treatment (Mean± S.D)</td>
<td>After 3 months treatment (Mean± S.D)</td>
<td>Before treatment (Mean± S.D)</td>
</tr>
<tr>
<td>Systolic blood pressure, mm Hg</td>
<td>163.57±2.42</td>
<td>136.07±0.079</td>
<td>157.50±1.43</td>
</tr>
<tr>
<td>Diastolic blood pressure, mm Hg</td>
<td>95.71±0.71</td>
<td>80.18±0.79</td>
<td>97.17±0.57</td>
</tr>
<tr>
<td>Heart rate, beat/minute</td>
<td>78.79±87</td>
<td>60.04±0.10</td>
<td>78.47±0.96</td>
</tr>
</tbody>
</table>

The group taking enalapril showed a significant reduction of SBP, DBP, while there was no significant change in heart rate. So, the amlodipine–treated patients showed a significant decreases of SBP, DBP whereas the change in heart rate was not significant. In the normotensive control group, no significant changes were observed in SBP, DBP, heart rate after the 3 months follow-up period see & see Table (2) and figure (1,2,3).

Table (2): Blood pressure, heart rate in normotensive control subjects.

<table>
<thead>
<tr>
<th>Blood pressure &amp; Heart rate</th>
<th>At base line</th>
<th>At 3 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic blood pressure, mm Hg</td>
<td>123.7±1.55</td>
<td>124.65±1.32</td>
</tr>
<tr>
<td>Diastolic blood pressure, mm Hg</td>
<td>78.552±0.9</td>
<td>79.83±4.47</td>
</tr>
<tr>
<td>Heart rate, beat/minute</td>
<td>75.87±0.85</td>
<td>75.39±0.79</td>
</tr>
</tbody>
</table>

Comparisons among treated groups for changes from base line with that after 3 months treatment in mean SBP, DBP, Heart rate revealed no significant differences between the effects of atenolol, enalapril and amlodipine on SBP and DBP. & see figure (1,2,3).

Figure 1: Mean change in systolic blood pressure (mmHg) after 3 months treatment with daily atenolol (50-100mg), enalapril (10-20 mg), and amlodipine (5-10 mg).
Effects of treatment on serum lipid profile: In the atenolol-treated group no statistically significant changes were noted in serum lipid levels after 3 months of treatment (Table 3).

Table (3): Effects of atenolol, enalapril and amlodipine on serum lipid profile

<table>
<thead>
<tr>
<th>Serum lipid profile</th>
<th>Atenolol (50-100mg daily)</th>
<th>Enalapril (10-20 mg daily)</th>
<th>Amlodipine (5-10 mg daily)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before treatment (Mean± S.D)</td>
<td>Before treatment (Mean± S.D)</td>
<td>After 3 months treatment (Mean± S.D)</td>
</tr>
<tr>
<td>Total cholesterol, mg/dl</td>
<td>194.43±6.70</td>
<td>200.9±8.39</td>
<td>198.0±8.20</td>
</tr>
<tr>
<td>LDL- cholesterol, mg/dL</td>
<td>121.61±5.60</td>
<td>128.83±7.93</td>
<td>125.47±7.56</td>
</tr>
<tr>
<td>HDL- cholesterol, mg/dL</td>
<td>36.32±1.4</td>
<td>39.40±1.43</td>
<td>41.73±1.32</td>
</tr>
<tr>
<td>Triglycerides, mg/dL</td>
<td>184.36±13.10</td>
<td>155.57±12.28</td>
<td>155.60±11.52</td>
</tr>
</tbody>
</table>
Table 3 depict the effects of enalapril on serum lipid. After 3 months of treatment the total cholesterol level was reduced by enalapril but not significantly while HDL cholesterol level was significantly elevated.

In the amlodipine treated group a significant reduction was found in serum total cholesterol level and a significant decreases were found in serum LDL levels while the changes in serum HDL cholesterol and serum triglyceride levels were not statistically significant, Amlodipine was significantly better than atenolol and enalapril at reducing total cholesterol level. Amlodipine was significantly better than atenolol and enalapril at reducing LDL cholesterol level .Enalapril was significantly better than amlodipine and atenolol at increasing serum HDL level.

**Discussion**

In this study compare between antihypertensive drugs & we take three kinds which are atenolol, enalapril, or amlodipine and effect on patient significant increases in heart rate, SBP,DBP and subsequently mean arterial BP were observed in both hypertensives and normtensive control group . Concerning serum lipid levels,it was shown that hypertensive patients had a significantly higher total cholesterol levels and significantly less HDL cholesterol levels as compared to normotensive controls . These finding are consistent with that reported by Claudio Marone, 2001)9. It reflects the common association of hypertension withdyslipidaemia (Hunninghake, 1991)10. Effects of therapy on blood pressure and heart rate: The systolic and diastolic BP values were significantly reduced after, atenolol, enalapril, or amlodipine therapy . The anti-hypertensive efficacy of these drugs in patients with mild to moderate hypertension was comparable as was shown in earlier studies (Karlberg et al., 1999, Thurmann 1998)11,12. There was no significant change in heart rate in patients taking, enalapril, or amlodipine which is consistent with that reported else where (Karlberg et al., 1999)11. On the other hand heart rate was significantly reduced by atenolol which was expected from its beta blocking effect. Effects of therapy on serum lipids Hypertension commonly occurs in association with dyslipidemia and atherosclerosis. In the enalapril treated group a significant increase of HDL cholesterol was found and this support the view that ACE inhibitors have a beneficial effects on lipid metabolism (Hunninghake, 1991) 13. The favorable lipid changes observed with amlodipine, namely a significant decreases of total cholesterol and LDL cholesterol levels are in agreement with that reported by(Stein et al., 1991; Richard et al., 1996)14,15 have suggested that calcium channel blockers especially amlodipine cause up regulation of LDL receptors in the liver with enhanced LDL clearance .Beta1, selective blockers like atenolol may induce a shift toward a more atherogenic lipid profile namely a decrease of HDL cholesterol and an increase of LDL cholesterol .These effects are attributed to the inhibition of lecithin cholesterol acyl transferase (LCAT) enzyme and decrease in hepatic LDL receptors (pesant et al., 1999)16 by these drugs .Our study did not document statistically significant adverse effects of atenolol on serum lipid levels. In fact, there was a decrease of HDL cholesterol but the reduction was not statistically significant.

**Conclusion**

Patients taking atenolol showed a significant reduction of SBP, heart rate & The group taking enalapril showed a significant reduction of SBP, DBP, while there was no significant change in heart rate . The amlodipine –treated patients showed a significant decreases of SBP, DBP whereas the change in heart rate was not significant. Concerning the effects on serum lipid profile the following favorable changes were observed : HDL-cholesterol was significantly increased by enalapril while LDL-cholesterol and Total cholesterol was significantly reduced by amlodipine . The amlodipine are to be preferred in hypertensive patients with elevated LDL-cholesterol levels .On the other hand, enalapril is valuable in hypertensive patients with low HDL-cholesterol levels.

**Conflict of Interest:** None

**Source of Findings:** Self-findings.

**Ethical Consideration:** None

**References**

3. ESC-ESH Guidelines for the Management of Arterial Hypertension2018


Effect of Lifestyle, Dietary Pattern, School Based Weight Control Program on Overnutrition among Schoolchildren in the Northeast of Thailand

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Abstract

**Background:** Overnutrition are dramatically raising among school age group in lowand middle-income countries.

**Method:** A cross-sectional study was conducted among 494 grades five and six pupils from ten primary schools in four provinces of the Northeast of Thailand. The multiple logistic regression was used to determine the association between dietary pattern, school-based program, lifestyle, socio-demographic and overnutrition among school children in the Northeast of Thailand.

**Results:** 14.2% of the pupils were overnutrition. The multivariable analysis indicated factors that significantly associated with overnutrition among school children were; consumed high calories food (adj. OR= 4.67; 95%CI: 2.46-8.85), did not participate in school weight control program (adj. OR=4.08; 95%CI: 2.08-8.02), did not join weight control school lunch program (adj. OR= 4.49; 95%CI: 1.89-10.85), did not consume weight control food (adj. OR=3.46; 95%CI: 1.64-7.30), no physical activity (adj. OR = 3.02; 95%CI: 1.56-5.76), when controlling the effect of other covariates.

**Conclusion:** Almost one-sixth of the pupils were overnutrition. Dietary pattern, school-based program, lifestyle, socio-demographic had influence on overnutrition. Appropriate management on food consumption and school-based program, improving lifestyle would help control overweight and obesity.

**Keywords:** Dietary Food Consumption, Lifestyle Socio-Demographic, School Based Program, Overnutrition, Overweight and Obesity.

Introduction

The increasing rates of overnutrition which comprises overweight and obesity (OW/OB) were almost doubled since 1980¹. Overnutrition is a key factor of noncommunicable diseases which are the leading cause of death worldwide². In Thailand, the overall picture is unclear³ due to differences in year of survey, sampling, the age range of children studied and the criteria used for defining OW/OB. For example, a national survey of 10 provinces in 2003 found 5.4% of children aged 6-14 years were OW/OB⁴. In the same year an OW/OB of 10.8% was reported in a survey among children aged 7-9 years in a province in the Northeast⁵. The OW/OB rate at 13.7%, was report for older age group (12-18 years) in the same area⁶. The Thailand Multiple Indicator Cluster Survey in children aged 6-14 years over the period 1995-
2009, and the latest data indicated a national prevalence for primary school children of 9.7%.

Continuous surveillance is necessary due to the associated short- and long-term problems. Perhaps the most serious consequence is the likelihood that childhood obesity will prevail in adulthood. In the USA overweight kindergarten children are four times more likely to become obese as young teenagers than normal weighted kindergarteners, a study showed that infant weight and preschool body mass index (BMI) were strongly associated with overweight in later childhood and adolescence, and a systematic review concluded that obese children and adolescents are more likely to be obese as adults.

In Southeast Asia region (SEAR), Malaysia had the highest obesity prevalence at 14%, while Thailand (8.8%) had the second ranking. According to WHO, the prevalence of overweight and obesity in Thai females was higher than males. In Thailand, these are likely to be different from those found in other countries, especially western developed countries.

Many factors have been indicated as associated with childhood OW/OB. These include gender, high birth weight, dietary behavior, high media consumption, dietary concerns, body satisfaction and psychosocial factors, skipping breakfast, excess energy and fat intakes, television viewing. Family-based factors have included low literacy of mothers, parental OW/OB, family dysfunction, neighborhood socioeconomic status are the factor influence on the OW/OB. Fried food sales around the school are the factor considered as the school based program influence on the OW/OB.

There was limited study on OW/OB and its determinants among school children especially in the Northeast of Thailand. Therefore, it is important to determine the prevalence of overnutrition and its associate factors including dietary intake, school-based weight control program, lifestyle, socio-demographic among school children in the Northeast of Thailand.

**Method**

**Study Design and Population:** This cross-sectional study was conducted among schoolchildren in the Northeast of Thailand. The total of 494 participants were recruited by using a multistage random sampling from ten primary school in four provinces. The inclusion criteria were 1) pupil in the age 10-11 years, 2) studying in the grade 5th and 6th of primary school, 3) agreed to participated in this study with a written informed consent from their parents. The pupil who suffering with severe illness or had mental health problems were excluded. An anthropometric measurement was performed by trained health teachers. A self-administered structured questionnaire was used to assess socio-demographic, lifestyle, dietary intake, school-based weight control program. The outcome variable was and overweight status (overweight and obesity), using the weight-for-height growth chart developed by the Ministry of Public Health (MoPH), Thailand that standardized to WHO and the IOTF. Subjects were categorized by the number of SDs which their weight-for-height at their age was above or below the reference value: obesity (>+3 SD), overweight (>+2.0 to +3.0 SD), slightly overweight (>+1.5 to +3.0 SD), normal (-1.5 to +1.5 SD), slightly underweight/thin/underweight (<-1.5 SD). The slightly underweight, thin and underweight categories were combined because children in these groups were outside the focus of the present study. All the anthropometric measurements were assessed by teachers trained in school health using a Xiangshan EB9003L electronic weighing scale and an Invicta B8A7415 to measure height.

**Statistical Analysis:** Descriptive statistics including frequency and percentage were used to describe categorical data, whereas mean, standard deviation were for continuous data. A simple logistic regression was used to identify the association between each independent variable and OW/OB. The independent factors that had p-value <0.25 were processed to the multi variable analysis using the multiple logistic regression to identify their association with OW/OB when controlling the effect of other covariates.

**Results**

Among the total of 494 respondents, 55.9% were males with an average age of 10.9 ± 0.5 years old. Majority of the respondents stayed with parents (76.1%) and at least one family member had history of obese in their family (29.6%). Their family financial status was had enough income with saving. Most of them had physical activities and aware of their own body image (84%). Majority of them did not consumed weight control food. Almost all of them had low to average levels of overnutrition prevention and low to average level of overnutrition prevention behaviors. A quarter
usually consumed high calories food. Concerning school factor, nearly half joining exercise provided by school all the times, 92.9% participated in weight control school lunch program, 40.1% participated in school weight control program and majority of these pupils had information on high calories diet and drinks.

Most of the pupils had normal weight (65.2%), 13.3% were underweight. Concerning overnutrition; Slightly overweight was 7.3%, overweight and obese were 5.7% and 8.5%, respectively which means 14.2% of the pupils were overnutrition.

### Table 1. Multivariable analysis of factors associated with OW/OB

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number</th>
<th>OW/OB %</th>
<th>Adj. OR</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumed high calories diet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Never</td>
<td>399</td>
<td>10.5</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sometimes/Every day/often</td>
<td>95</td>
<td>29.5</td>
<td>4.67</td>
<td>2.46-8.85</td>
<td></td>
</tr>
<tr>
<td>Participated in weight control school lunch program</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.001</td>
</tr>
<tr>
<td>Yes</td>
<td>459</td>
<td>13.1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>35</td>
<td>28.6</td>
<td>4.49</td>
<td>1.89-10.85</td>
<td></td>
</tr>
<tr>
<td>Participated in school weight control program</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Yes</td>
<td>202</td>
<td>6.9</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>292</td>
<td>19.2</td>
<td>4.08</td>
<td>2.08-8.02</td>
<td></td>
</tr>
<tr>
<td>Consume weight control food</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.001</td>
</tr>
<tr>
<td>Yes</td>
<td>148</td>
<td>8.11</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>346</td>
<td>16.8</td>
<td>3.46</td>
<td>1.64 – 7.30</td>
<td></td>
</tr>
<tr>
<td>Physical activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.001</td>
</tr>
<tr>
<td>Yes</td>
<td>415</td>
<td>11.6</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>79</td>
<td>27.9</td>
<td>3.02</td>
<td>1.56 - 5.76</td>
<td></td>
</tr>
<tr>
<td>Family history of obesity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.016</td>
</tr>
<tr>
<td>No</td>
<td>348</td>
<td>17.2</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At least one family member</td>
<td>146</td>
<td>6.9</td>
<td>2.52</td>
<td>1.19 - 5.34</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.013</td>
</tr>
<tr>
<td>Female</td>
<td>276</td>
<td>10.9</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>218</td>
<td>18.4</td>
<td>2.08</td>
<td>1.17-3.72</td>
<td></td>
</tr>
</tbody>
</table>

The multiple logistic regression indicated four factors that were significantly associated with over nutrition among school children in the Northeast of Thailand included; consumed high calories diet(adj. OR= 4.67; 95% CI: 2.46-8.85), did not join school weight control program (adj. OR=4.08;95%CI: 2.08-8.02), did not participate in weight control school lunch program (adj. OR= 4.49; 95%CI: 1.89-10.85), did not consume weight control food (adj. OR=3.46; 95%CI: 1.64-7.30), no physical activity (adj. OR =3.02; 95%CI: 1.56-5.76), had family history of obesity (adj. OR=2.52; 95%CI: 1.19-5.34), were males (adj. OR=2.08; 95%CI: 1.17-3.72), when controlling the effect of other covariates (Table 1).

### Discussion

The present study indicated the prevalence of overnutrition (OW and OB) among school children in Northeast of Thailand was 14.2% which was higher than the age-adjusted rate of 10.7% reported in 2012 for children aged 7-9 years in major urban areas of the same region using a similar definition of OW/OB. This prevalence exceeds 10% of minimized a risk problem
of the Thai Ministry of Public Health (MoPH) in the National Health Development Plan XII (2017-2021)\textsuperscript{32}. This finding is consistent with those of previous studies in Thailand over the period 2006 to 2013\textsuperscript{31,34,35}. This suggested the problem of increasing prevalence over the past decade. The rise in OW/OB in Southeast Asia is likely to have been largely due to the increasing consumption of fast foods which tend to be very fattening. A study of Chinese Singaporeans by Odegaard et al.\textsuperscript{36} found the relationship between fast food consumption with Type 2 diabetes (T2DM) and coronary heart disease (CHD). Therefore, fast food consumption was critical issue to weight gain and obesity risk\textsuperscript{37}.

Factors that were significantly associated with (OW/OB) of participants included; consumed high calories diet, did not participated in school weight control program, did not participate in weight control school lunch program, did not consume weight control food, no physical activity, had family history of obesity, and were males.

The finding also indicated that did not participate in weight control school lunch program is also associated with OW/OB that consistent with previous study indicated that school lunch program were significantly associated with OW/OB. Lunch provided by school was important\textsuperscript{18,28}, and regarding to dietary changes effected to dietary behaviors for childhood obesity\textsuperscript{20,21}. Physical activities at school were unrelated to the prevention of OW/OB. According to the children, their schools played was less satisfactory role in reducing the prevalence of OW/OB. Most of schoolchildren denied attending any school’s prevention and control of OW/OB programs. Therefore, schools need to review their contribution on reducing the problem of OW/OB. This major suggestion to school healthy policy, a global challenge for healthy meals in schools by multi-sectors was essential\textsuperscript{38}.

Being males were more likely to be OW/OB than females. This is inconsistent with previous research studies in Thailand, but consistent with elsewhere\textsuperscript{19,34}. The presence and direction of gender differences in OW/OB do appear to vary with ethnic and cultural factors\textsuperscript{34}. Perceived obesity in family members (first-degree relatives and grandparents) was associated with OW/OB. This finding is consistent with many previous studies in other parts of the world\textsuperscript{19,25,29}. Families can also have considerable influence over the diet of younger family members, and they also act as role models for patterns of food consumption and behavior which lead to overnutrition. Families should always be involved in attempts to reduce the prevalence of overnutrition in children.

### Conclusions

Almost one-sixth of the pupils was overnutrition. Dietary pattern, school-based weight control program, lifestyle, socio-demographic had influence on the school children overnutrition. Appropriate management on dietary food consumption and school-based program, improving lifestyle would help control the overnutrition problems among school children in the Northeast of Thailand.

**Ethical Clearance:** This study was approved by the Ethical Committee of Khon Kaen University, the approval number was HE 552278.

**Source of Funding:** Khon Kaen University, Thailand.

**Conflict of Interest:** None declared

### References


Neonatal and Birth Complications in Adolescent Pregnancy of Tikrit City

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²Assist. Prof, Department of Obstetrics and Gynecology, Medical College, University of Tikrit, Iraq

Abstract

Background: Adolescence is a transitional period from childhood to adulthood characterized by significant physiological, psychological and social changes. World Health Organization defines Teenage Pregnancy as “any pregnancy from a girl who is 10-19 years of age”, the age being defined as her age at the time the baby is born.

Aim of the Study: To study the correlation study between of fetal risk and adolescent pregnancy.

Patients and Method: A cross sectional study conducted in Department of Obstetrics and Gynecology in Salah El-Din teaching hospital at the period from the 1st of Feb. 2018 to the end of August 2018. Convenient sample of (100) teenage pregnant women, who are willing to participate in this study and available at the time of data collection include.

Results: The frequent outcome of pregnant women was birth (32%), followed by; birth & oligohydrominous (14%), the neonatal complications were present in 68% of pregnant woman’s neonates. The delivery complications were absent in 32% of pregnant women while present as episiotomy (50%), in general, delivery complications were present in 68% of pregnant women.

Conclusion: The neonatal complications were present in 68% of pregnant women.

Keywords: Neonatal; birth complications; adolescent pregnancy; Tikrit city.

Introduction

As to problems with the newborn, gestation during adolescence is associated with higher rates of low birth weight (LBW), preterm delivery, respiratory diseases, and birth trauma, besides a higher frequency of neonatal complications and infant mortality(1).

Many risk factors lie with parents themselves. In addition to the behaviors, one also has to look at one’s medical history. Parental obesity, combined with an excessive mother’s weight gain during pregnancy, increases the risk of the baby becoming overweight(2).

In many developing countries, the number of teenage pregnancies has decreased compared to the late 1990s, and some sub-Saharan countries are increasing. The latest UNFPA report on teenage pregnancy summarizes data worldwide and indicates the need for action to reduce risk factors.

According to the report, childbirth complications are the main cause of death for girls and women in developing countries, in addition to fetal death(3). The number of stillbirths and infant mortality is much higher among teenage mothers than among older women. The study explains that the consequences of unprofessional abortion also pose a major birth threat(24) therefore, the aim of current study to study the correlation study between of fetal risk and adolescent pregnancy in Tikrit city.

Study Design and Setting: A cross sectional study conducted in Department of Obstetrics and Gynecology in Salah El-Din teaching hospital at the period from the 1st of Feb. 2018 to the end of August 2018.
Study Subjects: Convenient sample of (100) women, who are willing to participate in this study and available at the time of data collection include.

Data were collected via modifiable questionnaire form put it and modified by supervisor senior. Questionnaire forms consist of (socio-demographic, obstetrical and maternal history, complications, infant history and complications questionnaires)

Results

Gravidity history of pregnant women showed primigravida (59%), 1-2 gravida (26%) and >2 gravida (15%). Parity history revealed nulliparity (63%), 1-2 children (30%) and >2 children (7%). History of abortion was detected in 6% of pregnant women. The gestational age of pregnant women was distributed as followings; 2% <28 weeks, 20% 28-36 weeks, 74% 37-40 weeks and 4% >40 weeks. Half of pregnant women had menarche at age of 12 years and younger.

More than half (53%) of pregnant women had married at age 14-16 years, 22% of them had married at age of 17-18 years and 25% of them had married at age of older than 18 years. (table 1).

Table 1: Gestational history of pregnant women.

<table>
<thead>
<tr>
<th>Variable</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravidity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primegravida</td>
<td>59</td>
<td>59.0</td>
</tr>
<tr>
<td>1-2 gravida</td>
<td>26</td>
<td>26.0</td>
</tr>
<tr>
<td>&gt;2 gravida</td>
<td>15</td>
<td>15.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nulliparous</td>
<td>63</td>
<td>63.0</td>
</tr>
<tr>
<td>1-2 children</td>
<td>30</td>
<td>30.0</td>
</tr>
<tr>
<td>&gt;2 children</td>
<td>7</td>
<td>7.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
</tr>
<tr>
<td>Abortion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>94</td>
<td>94.0</td>
</tr>
<tr>
<td>Yes</td>
<td>6</td>
<td>6.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
</tr>
<tr>
<td>Gestational age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;28 weeks</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>28-36 weeks</td>
<td>20</td>
<td>20.0</td>
</tr>
<tr>
<td>37-40 weeks</td>
<td>74</td>
<td>74.0</td>
</tr>
</tbody>
</table>

The consanguinity was first degree in 51% of pregnant women and second degree in 49% of them. Contraception history was positive among 17% of pregnant women and chronic diseases history was positive in 6% of pregnant women. Edema was present among 66% of pregnant women and immunization history was positive in 64% of them (table 2).

Table 2: Clinical history of pregnant women.

<table>
<thead>
<tr>
<th>Variable</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consanguinity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First degree</td>
<td>51</td>
<td>51.0</td>
</tr>
<tr>
<td>Second degree</td>
<td>49</td>
<td>49.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
</tr>
<tr>
<td>Contraception</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>17</td>
<td>17.0</td>
</tr>
<tr>
<td>Negative</td>
<td>83</td>
<td>83.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
</tr>
<tr>
<td>Chronic diseases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>6</td>
<td>6.0</td>
</tr>
<tr>
<td>Negative</td>
<td>94</td>
<td>94.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
</tr>
<tr>
<td>Edema</td>
<td></td>
<td></td>
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<tr>
<td>Positive</td>
<td>66</td>
<td>66.0</td>
</tr>
<tr>
<td>Negative</td>
<td>34</td>
<td>34.0</td>
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<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
</tr>
<tr>
<td>Immunization</td>
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<td></td>
</tr>
<tr>
<td>Positive</td>
<td>64</td>
<td>64.0</td>
</tr>
<tr>
<td>Negative</td>
<td>36</td>
<td>36.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
</tr>
</tbody>
</table>
The frequent outcome of pregnant women was birth (32%), followed by; birth & oligohydrominous (14%), birth & intensive care (8%), etc. The neonatal complications were present in 68% of pregnant woman’s neonates. All these findings were shown in table 3.

Table 3: Neonatal outcome and complications.

<table>
<thead>
<tr>
<th>Variable</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonatal complications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>32</td>
<td>32.0</td>
</tr>
<tr>
<td>Yes</td>
<td>68</td>
<td>68.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The delivery complications were absent in 32% of pregnant women while present as episiotomy (50%), hemorrhage (16%) and perineal tear (2%). In general, delivery complications were present in 68% of pregnant women. All these findings were shown in table 4.

Table 4: Delivery complications.

<table>
<thead>
<tr>
<th>Variable</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery complications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>16</td>
<td>16.0</td>
</tr>
<tr>
<td>Episiotomy</td>
<td>50</td>
<td>50.0</td>
</tr>
<tr>
<td>Perineal tear</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>None</td>
<td>32</td>
<td>32.0</td>
</tr>
<tr>
<td>Total</td>
<td>500</td>
<td>100.0</td>
</tr>
<tr>
<td>General delivery complications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>32</td>
<td>32.0</td>
</tr>
<tr>
<td>Yes</td>
<td>68</td>
<td>68.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Discussion

The present study showed that neonatal complications occurred in 68% of pregnant women’s newborns and the delivery complications were absent in 32% of pregnant women while present as episiotomy (50%), hemorrhage (16%) and perineal tear (2%). In general, delivery complications were present in 68% of pregnant women.

Results of Yazlle et al., 2009 showed complications in 38.3% of the adolescents and among the most frequent diagnoses were problems with the fetus or the placenta, and problems with the membranes and amniotic cavity and, also Santos et al., 2009 showed that 18.4% (119/648) of the newborns of adolescent mothers were transferred to the neonatal intensive care unit (NICU).

Conclusions:

The neonatal complications were present in 68% of pregnant women.

Conflict of Interest: none

Source of findings: self-findings.

Ethical consideration: the study was approved by the ethical committee of the Najaf scientific council for medical specialization of the obstetrics and Gynecology, and not to be used for other research object

References


7. Jolly MC, Sebire N. Harris. Obstacle risks of pregnancy in women less than 18 years old. Obenemeel 2000;96-962-6 [Cross Red] [Web of Science] [Medite].
Dental Faculty’s Knowledge and Attitude Regarding Covid 19 Disease in Qassim University, Saudi Arabia

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Abstract

Background: Present study aimed to explore the knowledge and attitude of dental faculty at Qassim University, regarding novel COVID 19 disease.

Method: The cross-sectional survey was conducted on the faculty at undergraduate dental school. The self-designed e-survey was administered to 78 faculty members to assess their knowledge and attitudes towards the COVID-19 disease. Data analysis was conducted by using SPSS version 23. Descriptive statistics were reported as frequency and percentages. Chi-square test was utilized to identify the correlation between the independent and dependent variables. The inferential statistics (Kruskal-Wallis tests and Mann-Whitney U test) were utilized for assessing the significance between study variables. The association between knowledge and attitude was evaluated by using Spearman’s rank correlation coefficient.

Results: A total of 55 faculty members (70.5%) responded. Mean knowledge score was 10± 2.71. 37 (67.3%) respondents showed positive attitude towards COVID-19 while 18(32.7%) displayed negative attitude. The mean attitude score was 4.08±0.50. Significant difference was found in knowledge (p-value=0.04) and attitude (p-value=0.015) of dental faculty based on designation.

Conclusions: Qassim University dentists were mindful of the COVID-19 symptoms, means of transmission, Cross-infection control and operative protocols practiced within dental clinics. However, dentists exhibited inadequate knowledge about the specific dental procedures that safeguard the dental staff and patients from COVID-19 in context of current outbreak.

Keywords: Knowledge, Attitude, COVID-19, cross-infection control, practice management.

Introduction

Human Coronaviruses have recently gained global attention after the emergence of a novel coronavirus that resulted in COVID 19 disease.1 COVID19 is a highly contagious viral infection that is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).2 It is composed of a single strand of RNA, 65-125nm in diameter. SARS-CoV-2 has crown like spikes on its outer surface that binds to receptors of target cells and facilities its entry into the host cells.3 Additionally, its high binding affinity to the human angiotensin converting enzyme receptors (ACE2) enables it to enter and target the human host cells.4

The subgroups of coronaviruses family are alpha(α), beta (β), gamma (γ) and delta (δ) coronavirus [5]. Alpha and beta coronaviruses mainly cause disease

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in humans and mammals infecting their respiratory, gastrointestinal and central nervous system.\textsuperscript{5} SARS-CoV-2 is phylogenetically related to the two highly pathogenic respiratory coronaviruses i.e Severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV). All of these belong to $\beta$-CoV based on viral genotyping\textsuperscript{6} and are profusely present in nasopharyngeal and salivary secretions of affected individuals.\textsuperscript{7} Initially, these viruses were believed to cause disease only in animals until the SARS-CoV triggered an outbreak in Guangdong, china in year 2002 resulting in severe acute respiratory syndrome (SARS) in humans.\textsuperscript{8} In 2012, another pathogenic coronavirus, known as Middle East respiratory syndrome coronaviruses (MERSCoV) caused an endemic in Middle Eastern countries.\textsuperscript{9}

SARS-CoV-2 is a zoonotic pathogen that is believed to have been originated in bats and pangolins and later transmitted to humans. It can be transmitted from animal to human and then from human to human contact.\textsuperscript{8} This particular strain of coronavirus has recently originated from a seafood market in Wuhan city, China in late December 2019. The affected patients reported with a novel viral pneumonia with classical symptoms of fever, cough, myalgia, fatigue, with abnormal chest CT. The other symptoms reported were sputum production, headache, hemoptysis, diarrhea and respiratory distress. Later, it disseminated to other parts of world leading to global emergency.\textsuperscript{10}

Novel coronavirus was officially announced as a causative agent of COVID -19 by the Chinese Centre for Disease Control and Prevention.\textsuperscript{10} Owing to rapid dissemination World Health Organization (WHO) affirmed COVID-19 as a public health emergency of international concern (PHEIC).\textsuperscript{12} Subsequently, due to continue spread at an alarming rate WHO has formally declared outbreak a pandemic disease on 11th March 2020. Up till now (April 17th, 2020) it has swept more than 205 countries globally with 2,206,535 confirmed cases and 148,651 deaths.\textsuperscript{13}

The current epidemiological data show COVID-19 has higher transmissibility than SARS-CoV and MERS-CoV. The possible routes of transmission in humans include direct contact through respiratory droplets inhalation and indirect through fomite transmission.\textsuperscript{7} Incubation period for COVID-19 is between 2 to 14 days and it can also be transmitted through asymptomatic patients.\textsuperscript{14} Thus, social distancing, proper hand hygiene, and surface disinfection are highly recommended to stop its rapid spread. Moreover, it was also found in saliva of infected patients. This can be attributed to its high binding capacity to ACE2 receptors which are highly concentrated in salivary glands.\textsuperscript{4} Thus, its high mutation rate, pathogenicity and numerous routes of transmission may contribute to nosocomial spread in healthcare settings especially dental offices. Up till now, no treatment or vaccine is available to treat COVID-19 disease and the main stay of the treatment is supportive care. The only critical intervention, available is preventive measures as advised by WHO is early viral testing for disease confirmation and ensuring symptomatic relief for infected patients.\textsuperscript{13}

Dental professionals and patients are at an increased risk of contracting COVID -19 due to specific nature of dental procedures which involves frequent face to face contact with the patients, their saliva and contaminated materials. Owing to rapid spread and poor understanding of the disease, the American Dental Association has suggested that all elective dental procedures should be deferred and only patients with true dental emergencies should be catered.\textsuperscript{15} Also, universal precautions, careful prescreening of patients and additional preventive measures are deemed necessary before treating the patients in dental settings.\textsuperscript{13}

It is mandatory for health professionals to provide good and safe patient care. Therefore, it is imperative that proper information and training sessions should be imparted to dental professionals to ensure awareness and readiness regarding this global emergency. Absence of proper training will not only delay the necessary treatment required for such patients but can contribute to rapid spread of disease. Hence, the present study aimed to explore the knowledge, and attitude of dental faculty at Qassim University, regarding novel COVID-19 disease. This survey intended to provide an insight regarding level of awareness among dentists about the Covid-19 disease and may help in shaping future guidelines, strategies, and fool proof infection control policies that will be implemented in dental settings.

**Method**

**Study Design, Participants and Site:** The current cross-sectional study was conducted on the Faculty at Qassim University College of Dentistry from 15\textsuperscript{th} to 31\textsuperscript{st} March, 2020. All the faculty members were briefed about the context and purpose of the research. An
online e-survey questionnaire was administered through an electronic mail to 78 faculty members to assess their knowledge and attitudes towards the COVID-19 disease. The study instrument was devised by a panel of experts according to the guidelines proposed by WHO and CDC. The instrument was then sent to the researchers from dental background to provide expert opinion on the ease of understanding, relevancy and time needed to fill. A second review was done and the modification in the questionnaire was carried out according to local requirements. Subsequently, a pilot study was carried out on limited sample of dental professionals (N=6). The professionals provided suggestions on making the study instrument shorter and simpler. After a comprehensive discussion, the study instrument was finalized. The instrument was found to be reliable with the Cronbach’s alpha of 0.77. The study instrument was divided into 3 parts. The first section of the e-survey constituted demographic questions inquiring about gender, designation and specialty. The second section included 13 research questions pertaining to participants’ knowledge regarding COVID-19 disease where yes and no options were provided for each question. The third part of the survey used 9 questions to ascertain the attitude of the faculty members towards COVID-19 disease on a 5-point Likert scale that was developed with balanced responses and neutral midpoint. The study tool assessed the awareness of faculty by probing about the mode of transmission, prevention, treatment and management of patients in the dental settings. The score for knowledge assessment ranged from 0 to13. The cutoff point of less than 9 (<9) was set for insufficient knowledge and greater than or equal to 9 (≥9) for sufficient knowledge. Attitude assessment was conducted, and the responses were documented on 5 point Likert scale. A score of 5 was assigned to strongly agree, 4 to agree, 3 to undecided, 2 to disagree and 1 to strongly disagree. A mean score of >4 was taken as positive attitude whereas score of <4 was considered as negative attitude.

Ethics, consent and permissions: The study was approved by the ethical committee of the Qassim University College of dentistry (Ref no ST/6074/2020). Furthermore, written consent was not obtained as the returning of filled questionnaires from respondents was taken as implied consent. Moreover, participants were informed about intent and content of study and were ensured about confidentiality of data.

Statistical Analysis: Data analysis was done by using SPSS version 23 (IBM Corp, 32 Armonk, N.Y., USA). Descriptive statistics were described in terms of frequency and percentages. In order to show association between dependent and independent variables Chi-square test was employed. Statistical significance was set at less than 0.05 (p-value<0.05). Also, the inferential statistics (Kruskal Wallis tests and Mann–Whitney U test, p < 0.05) were utilized for assessing the significance between study variables. The aforementioned non-parametric tests (Kruskal Wallis tests and Mann–Whitney U test) were applied because of smaller sample size. Spearman’s rank correlational coefficient was used to appraise any link between knowledge and attitude. (p < 0.05).

Results

A total of 55 faculty members, 31 females and 24 males, responded out of 78. About 74% of the participants belonged to clinical specialties and majority of the respondents were Lecturers (38.2%). The distribution of respondents’ characteristics is shown in Table 1.

Overall the mean knowledge score of the participants was 10± 2.71. Sufficient knowledge was exhibited by 72.7% of respondents whereas 27.3% displayed insufficient knowledge. The study participants showed excellent knowledge (between 98% to 80%) for the stems that enquired about mode of transmission, urgent dental care procedures, significance of PPE while patient examination, use of high volume suction and WHO guidelines regarding hand hygiene. On the other hand, knowledge was good to fair (between 80% to 70%) for questions regarding rubber dam isolation, use of N95 masks, four handed dentistry, extraction protocol, antibiotic use and tele screening. Lastly, inadequate knowledge was evident in reaction to two questions, one regarding safety of use of ultrasonic in Covid-19 suspected patients and the other was related to efficacy of 1% of hydrogen peroxide mouthwash as a pre-rinse. Response was 61.2% and 38.2% respectively. Table 2 describes knowledge of participants regarding COVID-19 disease in detail.

Attitude of the respondents is summarized in Table 3. Of 55 respondents, 37 (67.3%) showed positive attitude (>4) towards COVID-19 while 18 respondents (32.7%) displayed negative attitude (<4) regarding disease. The mean attitude score was in range of 4.08±0.50. Overall faculty showed positive attitude.
when asked about fear of getting infected with COVID 19, treating only emergency cases, seeking patient’s relevant medical history, asking about recent travel, checking body temperature and avoiding procedures that cause aerosol production. Conversely, the most negative attitude (3.42±1.08) was noted when the faculty was asked if they would like to volunteer their services in support of medical teams in case of future emergencies. Moreover, mean scores were found to be <4 in questions related to anxiety, caries removal and training sessions. Significant correlation was noted between designation and attitude for items number 6 (p-value=0.001) and 7 (p-value= 0.03).

In table 4, the relationship of demographic characteristics with mean attitude and knowledge amongst dental faculty is displayed. Results of the present study showed no significant correlation of gender and specialty with both knowledge and attitude. However, a meaningful disagreement was found in knowledge and attitude of dental faculty on the basis of designation. The results showed that Professors/associate professors were equipped with better knowledge and attitude regarding COVID-19 disease than lecturers. Spearman correlation showed significant positive correlation between the knowledge level and attitude of faculty members about COVID-19 (r=0.557, p value=0.01).

Table 1: Distribution of faculty members according to their characteristics

<table>
<thead>
<tr>
<th>Descriptions</th>
<th>Faculty Members N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>31(56.4)</td>
</tr>
<tr>
<td>Male</td>
<td>24(43.6)</td>
</tr>
<tr>
<td>Designation</td>
<td></td>
</tr>
<tr>
<td>Associate Prof/Professor</td>
<td>17(30.9)</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>17(30.9)</td>
</tr>
<tr>
<td>Lecturer</td>
<td>21(38.2)</td>
</tr>
<tr>
<td>Specialty</td>
<td></td>
</tr>
<tr>
<td>Preclinical</td>
<td>14(25.5)</td>
</tr>
<tr>
<td>Clinical</td>
<td>41(74.5)</td>
</tr>
</tbody>
</table>

Table 2: Knowledge of Faculty members about COVID 19

<table>
<thead>
<tr>
<th>Knowledge of COVID19</th>
<th>Correct Answer N (%)</th>
<th>Incorrect Answer N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode of transmission of COVID 19 is Fomite transmission and by respiratory droplets.</td>
<td>54(98.2)</td>
<td>1(1.8)</td>
</tr>
<tr>
<td>WHO suggests that washing hands with water and soap for minimum 20 secs can help in the prevention of disease transmission</td>
<td>45(81.8)</td>
<td>10(18.2)</td>
</tr>
<tr>
<td>Tele-screening via phone is recommended as first line of action to identify patients with possible COVID 19</td>
<td>39(70.9)</td>
<td>16(29.1)</td>
</tr>
<tr>
<td>Urgent dental care includes severe toothache, cellulitis, Ludwig’s angina, uncontrolled bleeding and Oro-facial trauma</td>
<td>53(96.4)</td>
<td>2(3.6)</td>
</tr>
<tr>
<td>Most effective mouth wash as a pre-rinse to protect against COVID 19 infection is 1% hydrogen peroxide</td>
<td>21(38.2)</td>
<td>34(61.2)</td>
</tr>
<tr>
<td>Four handed dentistry is highly recommended for controlling the spread of disease</td>
<td>42(76.4)</td>
<td>13(23.6)</td>
</tr>
<tr>
<td>Face shields and eye wear are essential while examining the patients</td>
<td>50(90.9)</td>
<td>5(9.1)</td>
</tr>
<tr>
<td>Ultrasonic devices can be safely used in dental office for patients</td>
<td>34(61.2)</td>
<td>21(38.2)</td>
</tr>
<tr>
<td>After extraction resorbable sutures should be used in patients</td>
<td>41(74.5)</td>
<td>14(25.5)</td>
</tr>
<tr>
<td>N-95 mask is essential while examining the patients</td>
<td>42(76.4)</td>
<td>13(23.6)</td>
</tr>
<tr>
<td>Rubber dam isolation is a prerequisite for every patient</td>
<td>43(78.2)</td>
<td>12(21.8)</td>
</tr>
<tr>
<td>High volume suction is mandatory in dental practice</td>
<td>44(80)</td>
<td>11(20)</td>
</tr>
<tr>
<td>Antibiotics are the first line of treatment</td>
<td>41(74.5)</td>
<td>14(25.5)</td>
</tr>
</tbody>
</table>

Note: Assessment of knowledge was done by awarding 0 for incorrect answer and 1 for correct answer. The range of knowledge score was from 0 to 13. Cumulative score of less than 9 was considered as insufficient score whereas greater than 9 were considered as sufficient knowledge score. Mean value of knowledge score=10 ± 2.71.
Table 3: Attitude of Faculty Members towards COVID 19

<table>
<thead>
<tr>
<th>Items</th>
<th>Faculty’s Responses’ N (%)</th>
<th>p-value</th>
<th>p-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are you scared of getting infected with Covid-19 from a patient or a co-worker?¹</td>
<td>19(34.5) 24(43.6) 7(12.7) 4(7.3) 1(1.8)</td>
<td>0.78</td>
<td>0.74</td>
<td>0.44</td>
</tr>
<tr>
<td>Are you anxious of providing treatment to a patient who is suspected of being infected with Covid 19?²</td>
<td>11(20%) 26(47.3) 8(14.5) 6(10.9) 4(7.3)</td>
<td>0.93</td>
<td>0.62</td>
<td>0.16</td>
</tr>
<tr>
<td>Currently every patient’s travel history and body temperature should be taken before performing any dental procedure³</td>
<td>36(65.4) 16(29.1) 2(3.6) 0(0) 1(1.8)</td>
<td>0.27</td>
<td>0.46</td>
<td>0.48</td>
</tr>
<tr>
<td>Relevant medical history i.e respiratory illness like cough, sputum, fever, difficulty in breathing should be sought for every patient⁴</td>
<td>40(72.7) 13(23.6) 0(0) 0(0) 2(3.6)</td>
<td>0.35</td>
<td>0.09</td>
<td>0.60</td>
</tr>
<tr>
<td>Only emergency dental procedures should be carried out in current circumstances⁵</td>
<td>45(81.8) 8(14.5) 0(0) 0(0) 2(3.6)</td>
<td>0.25</td>
<td>0.77</td>
<td>0.47</td>
</tr>
<tr>
<td>Aerosol generating procedure such as use of triple syringe should be minimized as much as possible⁶</td>
<td>33(60) 12(21.8) 9(16.4) 0(0) 1(1.8)</td>
<td>0.10</td>
<td>0.001</td>
<td>0.12</td>
</tr>
<tr>
<td>Chemo mechanical method should be used for caries removal in patients with Irreversible pulpitis⁷</td>
<td>10(18.2) 19(34.5) 19(34.5) 5(9.1) 2(3.6)</td>
<td>0.16</td>
<td>0.03</td>
<td>0.82</td>
</tr>
<tr>
<td>Would you like to attend any training sessions to handle any untoward Covid 19 situation⁸</td>
<td>17(30.9) 22(40) 11(20) 3(5.4) 2(3.6)</td>
<td>0.67</td>
<td>0.45</td>
<td>0.78</td>
</tr>
<tr>
<td>Would you like to volunteer for working in support of medical teams in case of emergency⁹</td>
<td>11(20) 13(23.6) 21(38.2) 8(14.5) 2(3.6)</td>
<td>0.38</td>
<td>0.43</td>
<td>0.93</td>
</tr>
</tbody>
</table>

Posthoc¹ Tukey
Derived from ²Chi-square test and ³Kruskal Wallis test
⁴Strongly disagree=SD; Disagree=D; Undecided=U; Agree=A; Strongly agree=SA
**Note:** Mean attitude score=4.08±0.50
Mean Attitude value ± Standard deviation: a4.02±0.97, b3.62±1.14, c4.56±0.74, d4.62±0.83, e4.71±0.81, f4.38±0.90, g3.55±1.02, h3.89±1.03, i3.42±1.08

Table 4: Mean score of Knowledge and Attitude.

<table>
<thead>
<tr>
<th>Description</th>
<th>N (%)</th>
<th>Knowledge score (Mean ± SD)</th>
<th>Mean Rank</th>
<th>p-value</th>
<th>Attitude score (Mean ± SD)</th>
<th>Mean Rank</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>24(43.6)</td>
<td>10.42±2.2</td>
<td>29.60</td>
<td>0.51</td>
<td>4.12±0.40</td>
<td>28.06</td>
<td>0.98</td>
</tr>
<tr>
<td>Female</td>
<td>31(56.4)</td>
<td>9.68±3.04</td>
<td>26.76</td>
<td></td>
<td>4.05±0.63</td>
<td>27.95</td>
<td></td>
</tr>
<tr>
<td>Designation*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Associate Prof/Professor</td>
<td>17(30.9)</td>
<td>11±2.06</td>
<td>34.21</td>
<td>0.04</td>
<td>4.18±0.38</td>
<td>30.53</td>
<td>0.015</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>17(30.9)</td>
<td>10.10±2.83</td>
<td>28.81</td>
<td></td>
<td>4.18±0.65</td>
<td>33.33</td>
<td></td>
</tr>
<tr>
<td>Lecturer</td>
<td>21(38.2)</td>
<td>8.88±2.85</td>
<td>20.79</td>
<td></td>
<td>3.85±0.46</td>
<td>18.88</td>
<td></td>
</tr>
<tr>
<td>Specialty**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preclinical</td>
<td>14(25.5)</td>
<td>9.86±3.18</td>
<td>28.91</td>
<td>0.95</td>
<td>3.99±0.66</td>
<td>27.36</td>
<td>0.86</td>
</tr>
<tr>
<td>Clinical</td>
<td>41(74.5)</td>
<td>10.05±2.56</td>
<td>27.93</td>
<td></td>
<td>4.11±0.50</td>
<td>28.22</td>
<td></td>
</tr>
</tbody>
</table>

*Kruskal Wallis Test (p < 0.05). **Mann Whitney Test (p < 0.05).
Discussion

Pandemic of COVID-19 has led to global crisis. The rapid surge of COVID-19 disease has not only raised widespread public health concerns but has collapsed world’s economy. It has put immense strain on social stability and the global health systems, particularly challenging the health care workers including the Dental care professionals (DCP). It is, therefore, crucial that prudent information should be relayed to health care professionals in the time of this global emergency. Considering this, the current study investigated the knowledge and attitude of dental faculty towards the COVID-19 disease. To date, only limited studies are reported that explored dentists’ awareness and attitude towards COVID-19 contagion. Due to scare data available, the comparison of our outcomes has been done mainly with other associated conditions.

The current study revealed generally adequate knowledge and positive attitude of Qassim University dental faculty towards the COVID-19 disease. Most of the participants exhibited sufficient knowledge about questions related to mode of disease transmission, urgent dental care procedures, significance of PPE while examination, use of high volume suction and WHO guidelines regarding hand hygiene. These outcomes are in accordance with the results reported by Khader et al. in their study on the Jordanian dentists. These results are comparable to some of the studies done mainly with other associated conditions. Moreover, the findings are consistent with other studies which showed mean positive value in attitude domain. These results might be due to the inadequate briefing of the relevant authorities on the management issues during the educational campaign. Moreover, moderate knowledge about the aforementioned questions in our study might be due to the fact that in Saudi Arabia after the outbreak of COVID-19 more seminars are held for medical healthcare workers as compared to dentist community. Inadequate knowledge was ostensible in reply to two questions, one regarding safety of use of ultrasonic in Covid-19 suspected patients and the other was related to efficacy of 1% of hydrogen peroxide mouthwash as a pre-rinse.

Moreover, further insight into the study showed a positive mean value in attitude domain. These results are consistent with other studies which showed mean positive attitude of physicians. Dental faculty showed most affirmative response and positive attitude in reply to questions about anxiousness regarding cross infectivity, to accommodate only emergency cases, seeking patient’s relevant medical and travel history and minimization of aerosol generating procedures. The anxiety of our faculty regarding cross infectivity are contradictory to results of recent study, where most of the dentists (71.7%) perceived COVID-19 as moderately dangerous disease and almost one third believed that COVID-19 is not a serious public health issue. Although same study concluded that dentists should evaluate patients through measurement of the body temperature as a routine procedure and should be asked about any history of recent contact or travel [18],

On the other hand, with regard to the questions related to rubber dam isolation, four handed dentistry. Use of N95 mask, role of antibiotics, tele-screening and recommended extraction protocol and faculty exhibited moderate knowledge. Possible explanation for these findings could be the knowledge gap and poor understanding of disease transmission via high aerosol production during dental procedures. These results are comparable to some of the studies which concluded that dentists’ knowledge of respiratory disease contagion and its management was less as compared to other healthcare providers. Despite their proximity to the patient during treatment. Likewise, in a study conducted in Qassim in perspective of MERS, majority of health workers (57.6%) replied incorrectly when asked whether antibiotics are first choice drugs. This outcome is comparable with the result of another study where 40% of participants gave negative response when asked about specialized management protocols. This might be due to the inadequate briefing of the relevant authorities on the management issues during the educational campaign. Moreover, moderate knowledge about the aforementioned questions in our study might be due to the fact that in Saudi Arabia after the outbreak of COVID-19 more seminars are held for medical healthcare workers as compared to dentist community. Inadequate knowledge was ostensible in reply to two questions, one regarding safety of use of ultrasonic in Covid-19 suspected patients and the other was related to efficacy of 1% of hydrogen peroxide mouthwash as a pre-rinse.
and these results are in accordance with our study. These findings are also in harmony with another study in which health care workers displayed positive attitude in using personal protective gear and were adamant that goggles and gloves should be worn when dealing with healthcare related nosocomial infections.\textsuperscript{32}

The most negative attitude was seen in question no 9 (3.42±1.08) in which faculty was asked if they would like to volunteer their services in support of medical teams in case of future emergency. So far, there is no comparable data to assess the attitude of dentists about their involvement in COVID-19 emergency support teams but there is one recent study, which has presented model of dental outreach program in case of any untoward emergency situation in current diseases outbreak.\textsuperscript{33}

In present study mean scores were also found to be negative (less than 4) in question no 7 and 8, regarding willingness of dental faculty to attend any training sessions to handle any untoward Covid 19 situation. The reason for this negative response may be wrong perception of faculty, to link these training sessions as part of building volunteer teams. It was noticed that experience was appreciably linked with attitude, as senior faculty responded more positively as compared to younger ones, and this finding is comparable to study done during MERS outbreak in Middle East.\textsuperscript{21}

The relationship of demographic data with mean awareness and attitude was analyzed and results showed no significant correlation among the demographic variables, gender and specialty. These results are supported by literature which does not support the connection of gender with the awareness and attitude of healthcare workers.\textsuperscript{34} Although, the correlation of experience with awareness and attitude, has been stated meaningful by studies.\textsuperscript{35} Our study also exhibited a significant disparity in knowledge (p-value=0.04) and attitude (p-value=0.015) of dental faculty with respect to their designation. Professors/Associate professors were equipped with better knowledge and attitude regarding COVID19 disease than lecturers. This can be attributed to vision and experience of senior faculty members earned through years than the lecturers who are relatively young and new to the field.

The aforementioned findings, endorses meaningful association of awareness and attitude of dental faculty with regard to COVID -19. In light of this, it could be inferred that dentists depicting positive attitude are highly determined to gain information and to enhance their knowledge and skills to fight against disease. This can be rationalized by the philosophy of Reasoned Action, which states that an individual’s intent to a particular action depends on their attitude towards that conduct.\textsuperscript{36} Nevertheless, more extensive studies in future should be undertaken to explain possible correlation between knowledge and attitude displayed by dental faculty at Qassim. The merits of this study lie in its concept of addressing current pandemic dilemma and highlighting the area where little research has been done until now.

The key results of present study may be used to create awareness in designing efficient infection control measures of COVID-19. However, our study has certain limitations, the lower than expected response rate of faculty and short period of data collection has led to comparatively smaller sample size. Moreover, this pandemic has affected every aspect of life and caused many to be busy in making personal, official, and financial arrangements. This could have been resulted in selection bias and sampling error, which may limit the ability to generalize our results. Future studies are required in this context.

Conclusions

In summary, Qassim University dentists were mindful of the COVID-19 symptoms, means of transmission, Cross-infection control and operative protocols practiced within dental clinics. However, dentists exhibited inadequate knowledge about the specific dental procedures that safeguard the dental staff and patients from COVID-19 in context of current outbreak. Study recommends establishment of focused dental education drives to span the gap between the current and the requisite knowledge, to influence their attitude positively towards COVID-19.

Abbreviations: Not applicable

Acknowledgements: We wish to thank the faculty members who participated in the study.

Authors’ Contributions:

AMK and SN designed the study, MQJ and AMK collected the data, MQJ conducted data analysis, all authors contributed to writing. The authors read and approved the final manuscript.

Funding: Not Applicable
Availability of data and materials: The datasets generated and/or analysed during the current study are not publicly available due to ethics approval but are available from the corresponding author on reasonable request.

Ethics approval and consent to participate: Ethics approval was provided by the institutional ethical review committee of Qassim University.

Consent for Publication: Not applicable.

Competing Interests: The authors declare that they have no competing interests.

References


The Effects of Model IVS 2 MAP Progesterone, eCG, GnRH, and PGf2α on Pregnancy of Tail Fat Ewes Strain Sapudi Islands Subjected to A Short-term Synchronization of Estrus

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Abstract

The objective of this study was to verify the effects of engineering design of IVS 2 progesterone with 2 cm thick sponge and 2 cm length and 5 cm silicon plate in the middle with 13 cm nylon cord ties to pull the sponge position. Try to determine the effective dose of progesterone (MAP) with a dose of 60 mg progesterone, eCG, GnRH and PGf2α on pregnancy of ewes subjected to a short-term synchronization of estrus. Tail fat sheep ewes strain sapudi Islands received 60 mg MAP sponges model IVS 2 during 12 days plus 500 IU eCG folligon and 2.5 mg d-cloprostenol capriglandin (0.5 ml) submucosa vulva 24 h prior to IVS 2. Control groups (T0) 10 Ewes were assigned to receive 0.9% NaCl solution 2 ml im only when estrus sign showed waited for natural estrus. Group treatment 10 Ewes were (T1) IVS2 + 500 IU eCG folligon and group treatment 10 Ewes were (T2) IVS2 +500 IU eCG folligon 21.5 µg (0.5 ml) GnRH fertagyl gonadorelin, 24 hours after withdrawal. Each group was assigned to intracervical insemination by Vaginoscopy (n = 30). Artificial insemination was performed with a single dose of fresh semen on egg yolk skim milk dilluters. For controlled mating, females were exposed to males 48 hours after sponges removed. Ten females per treatment were subjected to transrectal ultrasound examination at 35 days late after AI. Estrous response (100.0%), pregnancy rates (T0 80% T1 70% and T2 70%), did not differ between T1 and T2 respectively (p >0.05). Administration of GnRH 24 hours after IVS 2 removed does not improve pregnancy rate in estrous synchronization in Tail fat ewes strain sapudi Islands (p >0.05) on day 35.

Keywords: Artificial insemination, intravaginal MAP progesterone model IVS 2, pregnancy rate, tail fat ewes strain Sapudi Islands.

Introduction

The IVS 2 intra vaginal sponge design technique contains progesterone/MPA (medroxy progesterone acetate) with a sponge diameter of 2 cm and a length of 2 cm thick and its center contains a T rod made of plastic silicon. This tool was created with the aim of efficient use of the hormone progesterone. Fat tailed sheep Sapudi Madura is a pure plasma of Sapudi Madura Island, East Java Indonesia. The hallmark of this sheep is having a sigmoid fat tail with an average width of 15 cm with a length of 25 cm. This tail is the accumulation of fat tissue as a source of energy and is typical. The average adult weight of males reaches 35 kg and females 25 kg¹. MPA belongs to a group of steroid hormones whose chemical composition is 6 methyl 17α acetoxy progesterone giving a 60 mg MPA sponge combination with a 500 IU intra-muscular Pregnant Mare Serum Gonadotropin (PMSG) or eCG, GnRH and PGf2α on pregnancy of ewes subjected to a short-term synchronization of estrus. combination will give very satisfying results. Research on the effect of giving intra vaginal sponge assemblies

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of medroxy progesterone acetate (MPA) to the speed
of onset of sheep estrus, the results showed that the
extraction on the 12th day was almost the same as the
speed of estrus by using PGF2α 7 mg intra-muscular
which is about 48 hours after the extraction had been
tested try MPA sponge2,3,4,5.

The use of MPA progesterone dose and its
combination with eCG folligon is given an injection of
300 IU intra muscular on the 12th day when the extraction
of progesterone. Intra vaginal vaginal progesterone
hormone given to 60 boar goats with a difference of
progesterone 30 mg and 60 mg given intravenously for 12
days did not show estrus differences both 100% showed
symptoms of lust but differed significantly in oestrous
period duration (p <0.01) was shorter in the control group
(29.3 hours versus 28.0 hours for Indigenous and Boer
goats, respectively), compared to the period induced to
60 mg. (31 and 32 h) or 30mg (40 h compared to 34 h) for each Boer goat6, 60 mg in case in ewe7. The use
of eCG (PMSG folligon) injection applied with the use
of intravaginal sponges MPA. 300 IU intra-muscularly
coinciding with the removal of sponge day 12 and the
dose of 500 IU eCG in ewe on the same day followed
by estrus on the day to day 14. The combined use of
progesterone and PGf2α on ewes subjected to a short-
term synchronization is usually used when injecting
2.5 mg d-cloprostenol capriglandin (0.5 ml) submucosa
vulva for efficient use or general dosage intra-muscularly
7.5 mg or (1.5 ml) is done simultaneously when sponge
release progesterone aims to lyse the corpus luteum8.
The combination of the GnRH hormone in this study
aims to grow follicles when injected on day 0 can serve
to stimulate anterior hypophysis to release FSH to
stimulate follicular growth in the follicular phase and if
injected the 13th day after being removed vaginal sponge
progesterone on the 12th day will serve as a trigger
anterior hypophysis to release LH which functions to
ovulate the gravian follicle. Fertagyl which contains the
GnRH hormone Gonadorelin is usually given at a dose
of 25 ug intra-muscularly9.

Materials and Method

A total of 30 Tail fat ewes strain sapudi Islands
that were confirmed to be 2 years old that had a body
score of at least 2 were previously treated with milk
concentrate A protein 15-17% (Phok Phand) 0.05 kg/
day/head for increased of body score condition(16,
19), for 1 month randomly divided into 2 groups with
each treatment received 10 replications of T0 (control
Groups) 10 ewe: Injected 0.9% NaCl solution 2 ml intra
muscular injections of control group, and T1 (treatment
groups 1) 10 ewe: IVS2 MAP progesterone, eCG and
PGf2 combined and T2 (treatment groups 2) 10 ewe: IVS2 MAP progesterone, eCG, PGf2 and GnRH.

Insemination using fresh semen is performed when
signs of estrus Artificial insemination was performed
with a single dose of fresh semen on egg yolk skim milk
dilluters. For controlled mating, females were exposed
to males 48 hours after sponges removed. IVS 2 design
type specifications required material sponge imprints
diameter 2 cm long Thick 2 cm in the middle there is a
silicone T shape with a length of 5 cm and is equipped
with a 15 cm long rope. Sponge contains Medroxy
Progesterone Acetate (MPA) 60 mg Cyprofloxacine 500
grams in vasceline alba.

Treatment and control groups are: T0 (control
Groups) 10 ewe: Injected 0.9% NaCl solution 2 ml intra
muscular, T1 (treatment groups 1) 10 ewe: IVS2 MAP
progesterone, eCG and PGf2 combined, T2 (treatment
groups 2) 10 ewe: IVS2 MAP progesterone, eCG, PGf2
and GnRH.

Statistical design and analysis: The research
design used was a complete random design and data
analysis was carried out using proportional quantitative
and qualitative analysis on estrus and pregnancy in
Tail fat ewes strain sapudi Islands. Some types of data
analysis that will be used are: Analysis of Variance
Analysis (ANOVA) and Honest Difference Test (SPSS
22)10.

Results and Discussion

The results showed no significant differences p
>0.05 in estrus sign, where average estrus of the 14th
all of p0 and groups of treatment showed real estrus.
This event allows the ovaries to give the opportunity
to develop sub-ordinate follicles into de Graaf follicles
in the injected Pg2α lysis stimulus of corpus luteum
periodic on day 12 and after that on the 14th day all
of them group showed symptoms of 100% estrus sign.
Contain FSH and LH on eCG folligon can be suport
follicle grow on folliculary phase on 12 days until 14th11.
The LH receptor is also expressed on granulosa cells.
have reported that the signaling pathways of LH do not
completely overlap, and this fact may have implications
for LH use in assisted reproductive techniques (ART)
a gonadotropin-releasing hormone (GnRH) agonist,
initially presented as a substitute for hCG, has led to a new
era of administering a GnRH agonist followed by hCG triggering for ovulation to give 24 hours after removed of the sponge. The response to superovulation, yield and quality of the embryo, is evaluated after increasing the time of exposure to exogenous progesterone during superstimulation, with or without the addition of GnRH agonists. Thirty-four females of the Santa Inês type were synchronized with an intravaginal progesterone device with the addition of GnRH 25 mg of gonadorelin when removed device in day 12. These results indicate the relationship of progesterone exposure longer plus the administration of GnRH during the release of progesterone device is an alternative to increase the rate of oocyte fertilization when insemination time is still used AI twice at 36 hours and 42 hours after the release of the progesterone device.

Table 1. The effects of model IVS 2 MAP progesterone, eCG, GnRH, and PGf2α on pregnancy of Tail fat ewes strain Sapudi Islands subjected to a short-term synchronization of estrus.

<table>
<thead>
<tr>
<th>Group of Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Tail Fat Strain Island</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Duration of estrus (h)</td>
<td>30±8</td>
<td>30±61</td>
<td>30±12</td>
</tr>
<tr>
<td>Occurrence of estrus (%)</td>
<td>100(10/10)</td>
<td>100(10/10)</td>
<td>100(10/10)</td>
</tr>
<tr>
<td>Pregnant observation used USG</td>
<td>80.00</td>
<td>70.00</td>
<td>70.00</td>
</tr>
</tbody>
</table>

The results showed no significant differences where the injection of PGF2α and eCG of the 12nd all of The Tail fat ewes strain Sapudi Islands showed real estrus. This event allows the ovaries to give the opportunity to develop PGF2α stimulus on day 12 after removed sponge and eCG grow follicles in the follicular phase. After AI on the 14th day all of them in group T0, T1 and T2 showed positive pregnancies of 80% (8 tail) in control groups, T1 70% (7 tails) and T2 70% (7 tails) in treatments groups. The uterus, and the fetus, have been described (Amrozi and Setiawan, 2011). Pregnancy diagnosis using USG on day 24 after AI or day 48 shows embryo images with hyper ecocgetic type Transrectal ultrasonography real-time B-mode shows embryonic vesicles early on the 12th day after marriage, but sensitivity is very low (12%) and higher on the 25th day after the marriage. Transcutaneous ultrasonography achieves the greatest accuracy for pregnancy diagnosis (94-100%) and determination of the number of fetuses (92-99%).

Administration of GnRH 24 hours injected after IVS 2 removed does not improve pregnancy rate in estrous synchronization in Tail fat ewes strain Sapudi Islands (p <0.05). Perhaps as a reason why GnRH does not show potentiation of increased number of pregnancies, it appears in the T1 group that the ability of endogenous LH or the ability of eCG can grow follicles based on the ability of the FSH they contain to be able to develop intra-cellular LH growth in the pituitary. In another study, all sheep were planted with progesterone with a combination of 400 IU eCG and 25 ug GnRH 36 hours after removed progesterone, apparently GnRH injection did not affect the efficiency of estrus synchronization progestin with GnRH, 85.1% compared to progestin without GnRH, 90.3% and pregnancy rates after laparoscopic artificial insemination progestins with GnRH, 53.7% compared to progestins without GnRH, 61.3%. Here we dare ourselves that GnRH is less efficient if it turns out that T1 compared to T2 seems to be no significant difference. Another reason that hormones stimulate the release of gonadotropins (GnRH) is a key neuro-peptide that controls the reproductive function of vertebrates, especially in ewe expected to experience spontaneous ovulation, ovarian steroids released by mature ovarian follicles controlling pulsatile patterns of GnRH release from the hypothalamus, in turn, stimulates the preovulatory secretions of the luteinizing hormone (LH) by the anterior pituitary gland.
Intravaginal progestagen sponge in sheep treated with two doses of 100 microgram cloprostenol while releasing progestagen sponge for 14 days. The percentage of sheep that responded to the synchronization treatment with signs of estrous behavior was similar at 72.4%. The use of progestagens resulted in the highest follicular diameter being higher to 5.9 mm, and showed the same fertilization rate of 70.6%. The new technology 50 µg of GnRH (Acegon, Lab. Syva, Leon, Spain), was prepared by mixing 1 mL of Acegon (equivalent to 50 µg of GnRH) with 4 mL of propylene-glycol, protocols based on a short-term intravaginal progesteron treatment and a single subcutaneous dose of GnRH in propylene-glycol at 36 h after progestagen removal induced. 80% of the animals developed estrus in a narrow timing 75%. administration of GnRH in propylene-glycol recommended in the intravaginal progesterone technique. The conception rate of the G14 days of P4 bunch was measurably higher than that of the other bunches (83.3%). 14 days of progesteron norgestomet treatment delivered higher conception rates and a more prominent number of pregnancies at the starting of the breeding season. Protocol for estrus synchronization the norgestomet implants were cut in half using scissors. One half (containing 1.5 mg norgestomet) was implanted subcutaneously in the ear of each ewe. At the time of implant removal, 400 IU of eCG (Folligon; Intervet) and 22.5 µg D-cloprostenol (Preloban; Intervet) were injected intramuscularly into every ewe and AI 0.5 ml semen.

Conclusion

In summary, the effects of model IVS 2 MAP progesterone, eCG, GnRH, and PGf2 on pregnancy of subjected to a short-term synchronization of estrus followed by estrus and pregnancy of the tail fat ewes strain sapudi Islands sign of estrus will be shown on day 14 and served of AI. 35 days late after AI treatment between control a research groups used diagnosis of pregnancies using USG for pregnancies diagnose. The result showed that no different \( p > 0.05 \) between control and treatment groups in estrus and preganatn. Injected of GnRH 24 hours after removed of sponge does not improve estrus or pregnancy rate in ewes.

Conflict of Interest: The author declare that they have no conflict of interest.

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Ethical Approval: This study was approved by the Faculty of Veterinary Medicine, Universitas Airlangga, Surabaya, Indonesia.

References


Sociodemographic Profile of Thyroid Masses: A Cross-Sectional Study

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Abstract

Introduction: Thyroid gland is the most superficial endocrine gland of the human body in the region of the neck and is easily accessible to both clinical and radiological examinations. The thyroid masses must be diagnosed and managed as early as possible to avoid any malignancy.

Objectives: To evaluate the socio-demographic profile of patient including age and gender distribution in thyroid lesions.

Materials and Method: This prospective study was a cross-sectional descriptive one, which was conducted over the 50 subjects with thyroid masses. The collected data were subjected to a statistical analysis which was performed using a Statistical Package for the Social Sciences (SPSS) software version 20.0. Descriptive statistical method were computed, and the statistical significance was tested by chi-square test and student’s t-test. A p-value of less than 0.05 was considered statistically significant. Ethical clearance was taken from ethics committee (H).

Results: There was a female preponderance of 70% associated with this disease entity, against its male counterpart as 30%. The male to female ratio is 1:2:33. A maximum number of patients in our study is in the age group of 31-40 years of age, i.e. 40%. Most of the patients (76%) are from a rural area.

Conclusion: Female preponderance of thyroid masses in the age group of 31-40 years was observed and was more in rural areas. The sociodemographic profile is useful for better future planning of the management of thyroid masses.

Keywords: Female preponderance; young age group; rural involvement.
It has been very fascinating and challenging for a clinical radiologist to evaluate the thyroid gland and diagnose the thyroid pathologies.

In a study, out of the 70 patients who had thyroid diseases, the author reported 78.5% females and 21.4% as males. Maximum numbers of patients in the age group of 41-50 years were also reported in the same study, accounting for 35.7% of the cases.

Thyroid nodules are 4 times more common in women than men and their frequency increases with age and low iodine intake. The gender disparity is perhaps explained by the hormonal influences of both estrogen and progesterone, as increasing nodule size and new nodule development have been demonstrated to be related to pregnancy and multiparity. Exposure to ionizing radiation, either during childhood or as occupational exposure, will cause a rate of development of thyroid nodules of 2% per year, reaching a peak incidence in 15 to 25 years.

Clinically thyroid diseases present as painless gradual swelling of the neck. Sonography is only one of several diagnostic methods for use in the evaluation of thyroid diseases. Sonography images determine the morphology, the level extent of the masses and lymphadenopathy at different levels.

There are several sociodemographic factors which may cause the thyroid to become enlarged. A diet deficient in iodine can cause goitre but this is rarely the cause because of the readily available iodine in our diets.

A combination of clinical assessment and radiological examination provides an accurate diagnosis in the wide majority of cases. However, the sociodemographic profile of the cases is also important in managing these cases. This paper aims to evaluate the sociodemographic profile of the thyroid masses.

**Materials and Method**

This study was a cross-sectional descriptive one, which was conducted in the Department of Radiology with the help of the department of pathology at Gauhati Medical College Hospital. A total of 50 subjects were subjected to this research. All the patients were selected from outpatient departments and indoor wards of various departments (mostly from ENT & Surgery department). A thorough clinical examination was done in all the cases and the data were recorded accordingly in predesigned pre-tested proforma.

Finally, the sociodemographic data were subjected to a statistical analysis which was performed using a Statistical Package for the Social Sciences (SPSS) software version 20.0. Descriptive statistical methods were computed, and the statistical significance was tested by chi-square test and student’s t-test. A p-value of less than 0.05 was considered statistically significant. Ethical clearance was taken from ethics committee (H).

**Results**

The present study is an analysis of the sociodemographic profile of subjects having thyroid swelling. Initially, 62 patients of thyroid swelling were taken for study. Out of that, 50 cases were taken for study because other 12 cases the adequate amount of aspirate cannot be obtained.

**Sex distribution pattern:** It is evident from Table 1 and Figure 1 that there was a female preponderance of 70% associated with this disease entity, against its male counterpart 30%. The male to female ratio is 1:2:33.

**Table 1: Sex wise distribution of the cases**

<table>
<thead>
<tr>
<th>Sex</th>
<th>Number</th>
<th>Percentage (%)</th>
<th>Ratio (M/F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>15</td>
<td>30</td>
<td>1:2:33</td>
</tr>
<tr>
<td>Female</td>
<td>35</td>
<td>70</td>
<td></td>
</tr>
</tbody>
</table>

**Age distribution of the patients:** A maximum number of patients in our study in the age group of 31-40 yrs of age i.e. 40%. There is no case recorded below 10 yrs and above 70 yrs. The average age of the patients was 33.88 yrs (Table 2 and Figure 2).
Table 2: Age distribution of patients

<table>
<thead>
<tr>
<th>Age group in years</th>
<th>Number of patients</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11-20</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>21-30</td>
<td>14</td>
<td>28</td>
</tr>
<tr>
<td>31-40</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>41-50</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>51-60</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>61-70</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>71-80</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total 50</strong></td>
<td><strong>50</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Figure 2 Age distribution of patients

**Location of patients:** From Table 3, it is seen that most of the patients (76%) are from a rural area and Brahmaputra Valley. Details are narrated in Table 3.

Table 3: Location of the patients

<table>
<thead>
<tr>
<th>Residence</th>
<th>Number of patients</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Rural</td>
<td>38</td>
<td>76</td>
</tr>
<tr>
<td><strong>Total 50</strong></td>
<td><strong>50</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Occupational status of patients:** Majority of the female patients not having any definite occupation and they were an aid to engaged in household works as shown in Table 4.
### Table 4 Occupational status of patients

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Number of patients</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>House-wife</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>Cultivator</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Student</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Businessman</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Service</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

**Consistency of thyroid swelling:** The clinical impression of 50 thyroid nodule under study were solid were 29 cases and 8 cystic and rest were 13 were of mixed consistency as shown in Table 5.

### Table 5 Consistency of thyroid swelling

<table>
<thead>
<tr>
<th>Consistency</th>
<th>Number of patients</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid</td>
<td>29</td>
<td>58</td>
</tr>
<tr>
<td>Cystic</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Mixed</td>
<td>13</td>
<td>26</td>
</tr>
</tbody>
</table>

**Discussion**

Evaluation of thyroid pathology is one of the most common problems encountered in day today medical practice and the brunt of its diagnosis is falls on ENT and Head & Neck surgeon. Almost affecting the thyroid like degenerative diseases, hyperthyroidism, thyroiditis, a benign or malignant tumour can present as a circumscribed or diffuse swelling. Moreover, most of the patient are female so we have to take care of proper cosmetic. We should also try to preserve the normal function of thyroid for all cases in the rest of the life postoperatively.

In the present study, there was a preponderance of this disease entity towards female 70% as compared to male counterpart 30%. This can be explained by the increasing demand for iodine in females. Male to female ratio is found 1: 2.5, whereas, in most of the western series, the ratio being reported as 1.1.53. These findings are in agreement with the finding of Mazzaferri EL.8,9,10

In our study, the average age is 38years. In males, the mean age was 39.4years and females 30years. MC Gershengorn et al.13 also reported a mean age of 39in male and 35yrs in females respectively which agree with the current results.

Most of the patient in our study hailed from the rural area and since females outnumbered male and as the majority of female did not have any specific occupation and they are busy with their household work, maybe a factor of higher age incidence.

**Ethical Clearance:** Taken.

**Source of Funding:** None.

**Conflict of Interest:** None.

**References**


Ultrasonographic Evaluation of Thyroid Masses with Pathologic Correlation

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Abstract

Introduction: Thyroid gland is easily accessible to both clinical and radiological examinations. The thyroid masses must be diagnosed and managed as early as possible to rule out malignancy. Thyroid masses are typically found on physical examination or incidentally when other imaging studies are performed.

Objectives: Evaluation of the clinical profile of thyroid masses with ultrasonography (UGC) of the patient having thyroid lesions with pathologic correlation.

Materials and Method: This prospective study was a cross-sectional descriptive one, which was conducted over the 50 subjects with thyroid masses detected on USG, were further evaluated with Fine-needle Aspiration Cytology (FNAC) and Histopathological Examination (HPE). The USG features such as internal composition, echotexture, shape, margins, presence or absence of peripheral halo, calcification and internal vascularity were correlated with the final diagnosis. The collected data were subjected to a statistical analysis which was performed using a Statistical Package for the Social Sciences (SPSS) software version 20.0. Descriptive statistical method were computed, and the statistical significance was tested by chi-square test and student’s t-test. A p-value of less than 0.05 was considered statistically significant. Ethical clearance was taken from ethics committee (H).

Results: In USG diagnosis, goitre is the most common benign lesion in 63% followed by benign cyst 16%. Follicular carcinoma, medullary carcinoma and undifferentiated carcinoma 1 case of each variety was also detected at USG. Cytological examination of 50 cases, 44 (88%) cases revealed benign nature of thyroid swelling and 6 (12%) cases as malignant. The malignant thyroid cases diagnosed clinically and cytologically.

Conclusion: USG and FNAC with HPE are the primary diagnostic modalities a surgeon utilizes to determine the extent of thyroid surgery.

Keywords: Thyroid nodule; FNAC; Thyroid cancer; Molecular markers.

Introduction

The thyroid mass is a common thing. While autopsy data indicate a 50% prevalence of thyroid nodules larger than one centimetre in patients without clinical evidence of thyroid disease, the prevalence of palpable nodules is only 4 to 7%.¹,²

USG is far more sensitive than palpation, as it detects nodules of any size in up to 67% of the general population.³ Thyroid nodules warrant removal when they are large enough to be symptomatic, or if there is a concern for malignancy. The majority of nodules are asymptomatic, and with only 5 to 10% of nodules being malignant, the decision to operate is made on therapeutic or diagnostic grounds.⁴,⁵

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Ultrasound imaging studies and cytology from FNAC are the main tools used by the clinician to decide whether surgical excision of a thyroid nodule is warranted. Molecular genetic biomarker analyses are now being used to increase the accuracy of FNAC, and appear to substantially alter the clinical decision-making process as they become more widely available and more thoroughly evaluated.  

Alongside USG, FNAC found to be rapid, simple, safe, and cost-effective diagnostic modality in the investigation of thyroid disease with high sensitivity, specificity, and accuracy. It can be used as an excellent first-line method for investigating the nature of lesion. 

Therefore, in this paper, the USG evaluation of the thyroid masses with pathologic correlation was done.

**Materials and Method**

This study was a cross-sectional descriptive one, which was conducted in the Department of Radiology with the help of the department of pathology at Gauhati Medical College Hospital. A total of 50 subjects were subjected to this research. All the patients were selected from outpatient departments and indoor wards of various departments (mostly from ENT & Surgery department). A thorough clinical examination was done in all the cases and the data were recorded accordingly in predesigned pre-tested proforma.

Initially, a thorough clinical examination was done in all the cases and followed by necessary routine and special investigations were done as when it is necessary. In 62 cases FNAC was done and postoperative histopathology was done. In 12 cases FNAC report was inclusive and so they are excluded from the study. In 50 cases both cytological and histopathological examination was done and the results were correlated and analyzed independently.

For USG, patients were examined in the supine position on the USG table with the neck mildly hyperextended so that the examined can be done thoroughly. When the possible patient is examined with quiet breathing and swallowing suspended. The examination is completed with Colour Doppler study.

After taking the proper history, clinical examination and laboratory investigations, the patient is prepared for USG with a fully extended neck. Hitachi and Seimens Colour Doppler, Linear probe 13MHz is used for USG. Apart from routine blood investigation, X-Ray- A.P. & lateral view of the neck, P.A. View of the chest was done. The clinical diagnosis was done with Cytological examination (FNAC).

Finally, the data were subjected to a statistical analysis which was performed using a Statistical Package for the Social Sciences (SPSS) software version 20.0. Descriptive statistical method were computed, and the statistical significance was tested by chi-square test and student’s t-test. A p-value of less than 0.05 was considered statistically significant. Ethical clearance was taken from ethics committee (H).

**Result**

The present study is an analysis of USG of the thyroid swelling with pathologic correlation. Initially, 62 patients of thyroid swelling were taken for this study. Out of that only 50 cases were selected because the other 12 cases don’t give the adequate amount of aspirate.

**Benign lesion diagnosed by USG:** In USG diagnosis, goitre is the most common benign lesion in 63% followed by benign cyst 16% as shown in Figure 1.

**Malignant tumour diagnosed by USG:** Follicular carcinoma, medullary carcinoma and undifferentiated carcinoma 1 case of each variety were detected at USG.

**Distribution of thyroid lesion in order of frequency of ultrasonography report:** The distribution of thyroid lesion in order of frequency of ultrasonography report is shown in Figure 2.
Benign lesion diagnosed cytologically: Cytological examination of a total of 50 cases revealed benign nature of thyroid swelling in 44 cases (88%) and malignancy in 6 cases (12%). Among the malignant thyroid cases diagnosed clinically and cytologically, 3 cases were referred to B. Barooah Cancer Institute for further management.

Table 1 Various benign lesion diagnosed cytologically

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Number of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colloid Goiter</td>
<td>27</td>
<td>54</td>
</tr>
<tr>
<td>Follicular Adenoma</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>Subacute-Thyroiditis</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Hyperplastic Nodule</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Cyst</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>88%</td>
</tr>
</tbody>
</table>

The cytologically diagnosed benign group contains 54% of colloid goitre, 16% of the benign cyst (hemorrhagic and colloid cyst) and follicular adenoma of 14% of cases. Subacute-thyroiditis and hyperplastic thyroid nodule are 2% each as shown in Table 1.

Criteria for cytological diagnosis of the benign lesion was set as follows:

For Colloid goitre:
1. Abundant colloid.
2. Follicular cell is scanty, microfollicular structure occasionally preserved.
3. Degenerated RBC.
4. Free phagocytes with foamy cytoplasm.

Follicular adenoma:
1. Colloid material is usually scanty.
2. A number of the follicular cell are high and arranged in monolayer. They usually preserved follicular structure.

Subacute-thyroiditis: They usually shows polymorphonuclear leukocyte, necrotic tissue and few follicular cells.
Type of thyroid lesion diagnosed cytologically:
Out of 50 cases, 6 cases are found to be malignant on cytology. Out of the 33% is papillary carcinoma and follicular carcinoma each. And medullary carcinoma and anaplastic carcinoma are 17% each. Criteria for diagnosis malignant lesion cytologically:

Follicular carcinoma:
1. Increase nuclear size.
2. Increase cellularity.
3. Decrease the amount of colloid.
4. Microfollicular structure preserved.

Papillary carcinoma:
1. Increase cellularity.
2. Scanty colloid.
3. A papillary cluster of the cell.
4. Variation of cell size.
5. PSAMMOMA bodies (laminated calcification).
6. Intranuclear cytoplasmic inclusion.

Anaplastic Carcinoma:
1. Cell with either single or multiple nuclei present.
2. Necrotic material, cell debris, inflammatory cells mainly granulocytes present.

Correlation between ultrasonography and cytodiagnosis of different thyroid swelling: Our study shows the fallacy in diagnosing malignant lesion. In benign lesion, its accuracy is quite high as shown in Table 2.

<table>
<thead>
<tr>
<th>Types of lesion</th>
<th>Diagnosed at USG</th>
<th>Diagnosed at FNAC</th>
<th>% of diagnostic accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of cases</td>
<td>Number of cases</td>
<td></td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Colloid goiter</td>
<td>27</td>
<td>27</td>
<td>100</td>
</tr>
<tr>
<td>Follicular adenoma</td>
<td>7</td>
<td>6</td>
<td>85.7</td>
</tr>
<tr>
<td>Cyst</td>
<td>8</td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>Hurthle cell adenoma</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Papillary carcinoma</td>
<td>2</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>Follicular carcinoma</td>
<td>2</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>Medullary carcinoma</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>Undifferentiated carcinoma</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>Hyperplastic thyroid nodule</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hashimoto’s thyroiditis</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

Diagnostic accuracy of cytology: In 50 cases where the result of ultrasonography was confirmed by cytology, the diagnosis was accurate in 47 (94%) cases and inaccurate in 3 (6%) cases. Two cases of papillary carcinoma diagnosed as benign adenoma and one case of follicular adenoma were diagnosed as follicular carcinoma as shown in Table 3.

Table 3 Diagnostic accuracy of cytology

<table>
<thead>
<tr>
<th>Types of lesion</th>
<th>Ultrasound</th>
<th>Cytology</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of cases</td>
<td>%</td>
</tr>
<tr>
<td>Benign</td>
<td>43</td>
<td>100</td>
</tr>
<tr>
<td>Malignant</td>
<td>7</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>
Cytological pitfalls: Among the study of 50 cases false positive was found in one case of follicular adenoma as follicular carcinoma and two cases two papillary carcinomas as follicular adenoma. Our study shows the fallacy in diagnosing malignant lesion.

Discussion

Evaluation of thyroid pathology is one of the most common problems encountered in day today medical practice and the brunt of its diagnosis is falls on ENT and Head & Neck surgeon. Almost affecting the thyroid like degenerative diseases, hyperthyroidism, thyroiditis, a benign or malignant tumour can present as a circumscribed or diffuse swelling. Moreover, most of the patient are female so we have to take care of proper cosmetic. We should also try to preserve the normal function of thyroid for all cases in the rest of the life postoperatively.

Radioactive thyroid imaging focuses attenuation on non-functioning areas, but at least 80% of these are benign. Ultrasound has proved useful in delineating cystic lesion, through up to 10% of which may harbour malignant.

The rate accuracy of the benign lesion was 97% and malignant was 69%. The overall accuracy rate was 92% excluding false-positive and false-negative result. The rate of accuracy documented in the present study is consistent with Marqusee E et al.

Although the number of cases in our study was small the accuracy rate was quite high in comparison to the above studies. Out of 50 cases in 3 (6%) cases, USG was inaccurate, out of these three cases, one case was diagnosed as follicular adenoma as follicular carcinoma and two cases of papillary carcinoma diagnosed as follicular adenoma. Thus the false positive report was 2%and the false-positive was 4%. As reported by in a study false-positive report was 3.3% in our study, we take the small number of cases so false-negative result shows high value. Moreover, in most of the patients, we have taken the aspiration from one site which may not be the proper site of aspiration in cases of a malignant lesion. So if we had taken the aspiration from multiple sites than false-negative rate may be decreased. In our series of study, we have taken the aspiration just after clinical examination and palpation of swelling. With the help of the USG technique, we select the proper site for aspiration in our study one case of follicular adenoma is missed diagnosed as follicular carcinoma. Another two cases of papillary carcinoma were diagnosed as follicular adenoma. It may be because in follicular adenoma also cellularity of the smear increases colloid become scanty and monomorphic mono layered follicular cell are present, which are also the characteristic of papillary carcinoma. Moreover in papillary carcinoma intranuclear cytoplasmic invagination and psammoma bodies is the characteristic finding. In these studies, our aspirated material may not be sufficient enough or maybe not from the proper site to demonstrate the specific cytology.

In the present series clinically we have found 58% of the solid nodule, 16% of cystic and rest of mixed consistency. J Martin Miller et al. he reported 82% solid 11% cystic 7% mixed consistency.

When the result of the USG was compared with cytology it was observed than out of 7 malignant cases were misdiagnosed as a benign lesion. Two cases of papillary carcinoma as follicular adenoma and one case of follicular adenoma as follicular carcinoma. In our study shows 100% accuracy in the diagnosis of the benign cystic lesion which includes benign colloid cyst and benign hemorrhagic cyst.

In our present study, the diagnosis of the benign lesion in colloid goitre was made from the simple pattern of colloid and follicular cells.

Conclusion

The majority of thyroid nodules are benign, but they warrant surgical excision when they are large enough to be symptomatic or if there is a concern for malignancy. Ultrasound is the primary study by which the thyroid gland is imaged. However, some masses with sonographically suspicious warrant cytologic analysis through fine-needle aspiration biopsy to determine the risk of malignancy. USG and FNAC are the primary diagnostic modalities a surgeon utilizes to determine the extent of thyroid surgery.

Ethical Clearance: Taken.

Source of Funding: None.

Conflict of Interest: None.

References


Effect of Alcohol Consumption Severity on Oral Health Status in Relation to Salivary Parameters, Smoking and Tooth Wear in Baghdad, Iraq

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Abstract

Background: Alcohol consumption not only affects the general health yet in addition the dental and gingival health of a person. Heavy drinkers are at high danger of creating dental caries, gingival health alteration and tooth disintegration. This condition brings about change in the salivary gland function. Alcohol abuse with smoking have diverse effects on oral health. This study presented to evaluate the effect of alcohol consumption severity on oral health in relation to salivary parameters, smoking and tooth wear in Baghdad, Iraq.

Materials and Method: One hundred and twenty 35-40 years old men with alcohol consumption selected randomly. Alcohol consumption individuals classified into three groups according to frequency of alcohol consumption: regular drinker (GA), frequent drinker (GB) and occasion drinker (GC). Each group consists of 40 individuals. Gingival (GI), calculus (CI) and dental caries (DMFT) indices were utilized to assess dental and gingival health for all individuals. Parameters of saliva including flow rate and pH assessed immediately. Tooth wear (TW) was estimated according to the presence or absence of dentine. Smoking was recorded directly from individual. The results of present study was dissected utilizing SPSS version 23.

Results: The median is higher in GA than GB and GC with highly significant difference between groups. For PII, median is higher in GC than other groups, but the mean rank is higher in GA than other groups (no significant difference). For both GI and CI, median and mean rank are higher in GA than others with significant difference between them. Salivary flow rate and pH means are higher in GC than other groups with highly significant differences regarding pH. The high percentage of drinker with tooth wear was recorded in GA compared to other groups with significant difference. The median and mean rank are higher in smoking drinker than non-smoking drinkers with highly significant difference.

Conclusion: Dental caries, periodontal diseases, tooth wear and lower salivary pH were more presented in individuals with more frequent alcohol consumption. Alcohol drinking with smoking increase the occurrence of dental caries.

Keywords: Alcohol consumption; Regular drinker; DMFT; Tooth wear.

Introduction

Alcohol drinking may be an expansive haul utilized to any drinking about it that bring about mental or physical wellbeing issues. Problems of alcohol occur as a result of excessive consumption of it that affect not just with individuals, at will their families, groups and culture in general. Utilizing of liquor can influence all
component of body, yet uncommonly influences defense mechanism, liver, heart and nervous responses[1]. Alcohol drinking not only can affect the integrity of the whole body but also can affect the proper oral environment of a person[2,3]. It has been found that drunkards are at high danger of creating dental lesions, gingival impairment and may expose to the risk of oral cancer. Alcohol drinking whether in little or enormous sum can have huge influence on oral environment of a person in light of carelessness and may prompt various oral problems[4].

In long term alcohol drinkers, generally the parotid glands may get enlargement. This issue is called sialadenosis and ordinarily connected with ethanol incitation[5,6]. Unsettling influences in the salivary glands function happened because of sialadenosis. Decrease in the salivary discharge along with decline in buffering limit along with less oral cleanliness may prompt more chance of dental caries and gingival impairment[7]. Other hindering components comprise of utilizing of sugared beverages and cariogenic food and liquor. The acidic idea of mixed drinks along with utilization of sugar rich food bring about creation of acids and cause diminish in salivary pH underneath basic level. Obsoletely, it might cause advancement of dental lesions. Also, liquor misuse may cause expanding in Blood Lead Levels (BLLs) in people and BLLs which is associated with dental lesions[8].

An investigation got more caries activity among drunkards, likewise the heavy drinkers had more number of endodontically filled teeth in correlation non-heavy drinkers. Alcoholic drinkers had an extracted tooth three times more than the non-drinker for comparing ages [9]. Other research also found a positive relation between alcohol abuse and caries activity [10].

Alcohol consumption can prompt periodontal impairment for various reasons involving: gingival tissue aggravation; less oral cleanliness propensities among incessant liquor consumers; improper dietary patterns causing nourishing inadequacies among interminable heavy drinkers causing alteration of defense mechanism to exposing destructive compounds; less salivary discharge from liquor misuse make the microbes and plaque develop on the grounds that they are not eliminated away by salivation; progression of diseases to more serious condition as a result of ignorance of early symptoms of gingival diseases may lead periodontal impairment[11, 12].

An increased risk of developing dental erosion occurs as a result of people addiction to alcohol consumption. This happened because of alcohol use that considered the potential for expanding the debasement rate components and by the immediate and roundabout ethanol impacts [13]. The palatal surfaces of maxillary teeth are the most generally influenced tooth surfaces because of erosion followed by the occlusal surfaces of posterior teeth while the lower teeth and buccal surfaces of the maxillary teeth are least influenced by erosion [14]. It also found that alcohol use in conjunction with smoking cause increasing in the occurrence of dental lesion for individuals. Tobacco and alcohol consumptions cause changes in oral microorganisms that may assume a basic part in the development and exaggeration of dental lesion [15].

To the extent, no Iraqi investigation was led among individuals with alcohol consumption in Baghdad concerning the link between severity of alcohol consumption and dental caries, gingival diseases in relation to salivary parameters, smoking, and tooth wear. For all these clarification, this research was planned.

Materials and Method

One hundred and twenty 35-40 years old males with alcohol consumption from Baghdad City were included in this study. Individuals were selected randomly by making a special free offer at 4 alcohol stores (2 on the side of Karkh and 2 on the side of Al-Rusafa). This free offer includes doing a prophylaxis for an examination and a saliva sample collection which done in the private dental clinic last four months. Alcohol consumption individuals classified into three groups according to frequency of alcohol consumption [16]:

1. Regular drinker (GA) (More than four a week), 2. Frequent drinker (GB) (One to four days a week) and 3. Occasion drinker (GC) (Less than three days a week) Each group consists of 40 males. Gingival aggravation evaluated by utilizing gingival list (GI) of Löe and Silness[17]. Oral cleanliness status assessed by using Ramfjord calculus index (CI)[18], and plaque index (PlI) from claiming Silness and Löe[19]. Caries experience for each drinkers recorded according to WHO criterion utilizing DMFT index[20]. To assess salivary parameters, every person was approached to plunk down and loosen up much as could be expected under the circumstances and solicited to chew a piece from
Arabic gum for one minute before expectoration; for ten minutes, chewing was proceeded with a similar bit of gum and the assortment of salivation by spitting was finished within this time [21]. By dividing the absolute volume of saliva gathered in milliliter on the time of assortment in minute, flow rate of saliva was estimated. pH of saliva recorded by utilizing electronic pH meter.

According to the absence and present of dentine, tooth wear (TW) recorded was essentially dichotomized depending on the criterion of Bardsley et al[22].

Selected parameters were analyzed by utilizing SPSS 23 version (Statistical Package for Social Sciences).

**Results**

Table 1 illustrates the median and mean rank values of DMFT index among drinkers groups with statistical significance. The median and mean rank are higher in GA than GB and GC with highly significant difference between groups (Kruskal Wallis value = 10.000, p-value = 0.007). Mann-Whitney test for DMFT index shows highly significant difference between GA and GC (Mann-Whitney value = 487.000, Z = -3.050, p-value = 0.002), and significant difference between GB and GC (Mann-Whitney value = 579.500, Z = -2.150, p-value = 0.032), while no significant difference between GA and GB.

Median and mean rank of PII, GI and CI among drinker groups are demonstrated in Table 2. For PII, median is higher in GC (1.73) than other groups, but the mean rank is higher in GA (69.03) than other groups (no significant difference). For both GI and CI, median (1.71, 1.67 respectively) and mean rank (74.74, 72.39) are higher in GA than others with significant difference between them (Kruskal Wallis value = 11.214, 8.087, p-value = 0.004, 0.018 respectively). Mann-Whitney test for GI and CI record significant difference between (GA and GB), also between (GA and GC), while no significant difference between GB and GC.

Table 3 records mean values of stimulated salivary flow rate and pH among drinker groups with statistical differences. A higher value of SFR was found among GC (1.55 ml/min) compared to other groups with no significant differences between them, but t-test shows significant difference between GA and GC (p-value = 0.017, t-value = -2.438, df = 78). For salivary pH, also mean is higher in GC (6.66) than other groups with highly significant differences (p-value = 0.002, F-value = 2.903, df = 2). Using t-test highly significant difference was concluded between GA and GC (p-value = 0.001, t-value = -3.455, df = 78), also significant difference was recorded between GB and GC (p-value = 0.020, t-value = -2.369, df = 78).

The distribution of drinkers with tooth wear among drinker groups with statistical difference is presented in Table 4. The high percentage of drinker with tooth wear was recorded in GA (42.5%) compared to other groups with significant difference (p-value = 0.039, $\chi^2 = 6.48$, df = 2).

Table 5 shows the distribution of smoking drinkers among drinker groups with statistical difference. The high percentage of smoking drinker was shown in GA (42.5%) with no significant difference between drinker groups.

Table 6 concludes median and mean rank of DMFT index among smoking and non-smoking drinkers with statistical significant. The median (13) and mean rank (65.88) are higher in smoking drinker than non-smoking drinkers with highly significant difference (Mann-Whitney value = 550.500, Z = -3.626, p-value < 0.001).

**Table 1: Mean rank and median of DMFT among drinker groups with statistical significances**

<table>
<thead>
<tr>
<th>Drinker group</th>
<th>Median</th>
<th>Mean Rank</th>
<th>Kruskal Wallis Test (Chi square)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMFT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GA</td>
<td>14</td>
<td>70.88</td>
<td>10.000</td>
<td>0.007**</td>
</tr>
<tr>
<td>GB</td>
<td>13</td>
<td>63.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GC</td>
<td>12</td>
<td>47.16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2: Mean rank and median of gingival, calculus and plaque indices among drinker groups with statistical differences.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Drinker group</th>
<th>Median</th>
<th>Mean Rank</th>
<th>Kruskal Wallis Test (Chi square)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI</td>
<td>GA</td>
<td>1.71</td>
<td>69.03</td>
<td></td>
<td>3.63</td>
</tr>
<tr>
<td></td>
<td>GB</td>
<td>1.69</td>
<td>55.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GC</td>
<td>1.73</td>
<td>56.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GI</td>
<td>GA</td>
<td>1.71</td>
<td>74.74</td>
<td>11.214</td>
<td>0.004**</td>
</tr>
<tr>
<td></td>
<td>GB</td>
<td>1.61</td>
<td>57.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GC</td>
<td>1.50</td>
<td>49.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CI</td>
<td>GA</td>
<td>1.67</td>
<td>72.39</td>
<td>8.087</td>
<td>0.018*</td>
</tr>
<tr>
<td></td>
<td>GB</td>
<td>1.49</td>
<td>58.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GC</td>
<td>1.33</td>
<td>50.55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Mean values of salivary flow rate and pH among drinker with statistical differences.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>No.</th>
<th>(Mean ± SD)</th>
<th>Statistical difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>GA</td>
<td>40</td>
<td>6.21 ± 0.093</td>
<td>6.34</td>
</tr>
<tr>
<td></td>
<td>GB</td>
<td>40</td>
<td>6.35 ± 0.564</td>
<td>9.04**</td>
</tr>
<tr>
<td></td>
<td>GC</td>
<td>40</td>
<td>6.66 ± 0.578</td>
<td>8.07</td>
</tr>
<tr>
<td>Salivary flow rate (ml/min)</td>
<td>GA</td>
<td>40</td>
<td>1.30 ± 0.448</td>
<td>2.903</td>
</tr>
<tr>
<td></td>
<td>GB</td>
<td>40</td>
<td>1.40 ± 0.493</td>
<td>2.05</td>
</tr>
<tr>
<td></td>
<td>GC</td>
<td>40</td>
<td>1.55 ± 0.478</td>
<td>1.55</td>
</tr>
</tbody>
</table>

Table 4: The distribution of drinkers with tooth wear among drinker groups with statistical differences.

<table>
<thead>
<tr>
<th>Groups</th>
<th>No.</th>
<th>No. of drinkers with tooth wear</th>
<th>Statistical difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>GA</td>
<td>40</td>
<td>17</td>
<td>42.5</td>
</tr>
<tr>
<td>GB</td>
<td>40</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>GC</td>
<td>40</td>
<td>7</td>
<td>17.5</td>
</tr>
</tbody>
</table>

Table 5: the distribution of smoking drinkers among drinker groups with statistical difference.

<table>
<thead>
<tr>
<th>Groups</th>
<th>No.</th>
<th>No. of smoking drinkers</th>
<th>Statistical difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>GA</td>
<td>40</td>
<td>5</td>
<td>42.5</td>
</tr>
<tr>
<td>GB</td>
<td>40</td>
<td>7</td>
<td>25</td>
</tr>
<tr>
<td>GC</td>
<td>40</td>
<td>10</td>
<td>17.5</td>
</tr>
</tbody>
</table>

Table 6: Mean rank and median of DMFT index among smoking and non-smoking drinkers with statistical significant.

<table>
<thead>
<tr>
<th>Groups</th>
<th>No.</th>
<th>DMFT</th>
<th>Statistical difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking Drinkers</td>
<td>98</td>
<td>13</td>
<td>65.88</td>
</tr>
<tr>
<td>Non-Smoking Drinkers</td>
<td>22</td>
<td>11</td>
<td>36.52</td>
</tr>
</tbody>
</table>
Discussions

The problems of severe alcoholism have been linked with alteration in oral tissues and neglecting of oral health. Many researches recorded the association between alcohol drinking and oral health \[23, 24, 25].

This study showed that dental caries experience was higher in regular drinker than other groups. The amount of alcohol taken and prevalence of dental caries are associated positively. This finding is agreed with many studies\[11, 26, 27, 28, 29\]. Alcohol drinkers are known to have bad oral hygiene. It was found that alcohol user had incorrect personal and professional health care and also had dry mouth at night. Also, the consumption of high amount of refined carbohydrates may be the cause for high caries experience noted among them \[27\].

Periodontal disease represent many problems that can be ranged from simple inflammation of the gingiva to more serious one. Usually, it started in the mouth with bacterial growth along with building of plaque on the gingiva. This can be lead to inflammation or even a severe infection. Some kinds of gingival disease may be also become worse by alcohol consumption. It has been found in this study that mean rank of PII, GI, CI are higher in GA group than others and this is may be due to irritation to the gingival tissue. This result is in line with many studies\[11, 12, 13, 30, 31\]. Also, the individuals who are involved in alcohol user tend to have a bad dental hygiene habits. This result in making them more susceptible to such problems. The alcoholics persons tend to eat poorly, and this may cause nutritional deficiencies leading to all kinds of a disease to happen. Deficiencies in the diet can also make lowering in effectiveness of the immune response and so increasing the developing of gingiva disease. The persons who drink alcohol will often display the early symptoms of gingival disease which mean that easily treatable case of gingivitis will be progressed to a more serious one that involved permanent damage to the gums and teeth. In general, a poor oral health and bad dental care were associated with the periodontal problems in alcohol abusers \[32\].

It has been found in this study that the salivary flow rate is higher in GC group than other groups and this result agree with other studies \[33, 34\]. The reason for these results that the parotid gland become more swollen with excessive drinking (sialadenitis) that lead to alteration in the excretion and metabolism of the salivary glands \[35\].

The current study concludes, the high percentage of drinker with tooth wear was recorded in GA compared to other groups and this result similar to some studies \[13, 28, 29\]. The prolonged and regular abuse of acidic drinks as alcohol making the oral cavity more acidic in nature. This acidification result in dissolving the enamel surface and will make teeth surfaces more susceptible to a mechanical damage as tooth-brushing. Frequent vomiting occurs as a lowering in esophageal sphincter relaxes under the effect of alcohol. Enamel erosion occurred as a result of entering the acidic content of the stomach to the mouth (vomiting). This acidification along with reduction in salivary secretion and reduction in buffering capacity lead to raising the risk of enamel erosion \[13, 36\].

It has been recorded that smoking and alcohol consumption make adverse effects on individual as a general and oral health. In this study, the higher percentage of smoking was found among the GA group. The mean rank and median of DMFT are higher in smoking drinker than non-smoking drinkers with highly significant difference. There is a positive association smoking and alcohol abuse \[37, 38\]. Several mechanisms may lead to the relation between smoking and alcohol drinking, involving the genes which include in a regulating neurotransmitters, cross-sensitization and cross-tolerance, and common psychological and social factors \[39, 40\]. The high DMFT founded among smokers with alcohol abuse reflects the physical improper of oral hygiene measures and variation in oral micro-flora \[15\].

Conflict of Interest: We declare that there is conflict of interest

Ethical Approval: the research approved by scientific and ethical committee at our department

Source of Funding: the research funded by the authors only.

References


Effects of Stress, Depression, Self-efficacy, and Social Support on Quality of Life of Community Dwelling Elderly with Chronic Diseases

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Abstract

Background/Objectives: The purpose of this study was to analyze factors having effects on the quality of life of elderly with chronic diseases.

Method/Statistical Analysis: This study targeted 113 subjects in their 60 or up, residing in M city, D metropolitan city, C city, and G city. The data were analyzed using the descriptive statistics, t-test, ANOVA, Pearson’s correlation coefficient and stepwise multiple regression using the SPSS Window 23.0 program.

Findings: The stress (r=-.54, p<.001), and the depression and quality of life (r=-.62, p<.001) of subjects showed negative correlations while the self-efficacy (r=.68, p<.001), and the social support and quality of life (r=.69, p<.001) showed positive correlations. The self-efficacy (β=.39), social support (β=.39), the number of diseases (β=.14), depression (β=-.18) and age (β=.13) had effects on the quality of life of subjects, which showed 68.0% explanatory power.

Improvements/Applications: It would be necessary to increase self-efficacy that is confidence in their abilities, and to encourage and support elderly. In order not to get exposed to more diseases in the current state, it would be needed to seek for the measures for supporting, daily life management, and use of medication, decreasing depression, and giving a boost to live younger even when getting aged.

Keywords: Chronic disease, Elderly, Social support, Depression, Self-efficacy, Quality of life.

Introduction

Due to the rapid aging in Korea, the aged in their 65 or up which was 14.9% in 2019 is estimated to be increasing to 46.5% in 2067. The change rate of medical expenses under health insurance for the aged in their 65 or up in 2018 was 14.7%, which was 2.8% higher than the whole change rate (11.9%). The elderly evaluate their own health status as average or pretty bad, and more and more of them regard their health status as bad as they get older[1], so that there should be efforts in health care of the elderly.

Meanwhile, as a subjective well-being that evaluates the multi-dimensional elements of physical, functional, emotional, and social well-being, and also implies the concept of happy, satisfactory, and positive emotion and spirit, the quality of life expresses the well-being and satisfaction of life[2]. Especially, in the results reviewing the preceding researches related to the quality of life of the elderly, the elderly with chronic diseases had the lower quality of life than the elderly without chronic diseases[3], so that there should be more researches targeting them. They have to live with their chronic diseases for the rest of their lives. And as they get older, the quality of life gets lowered by various physical diseases.
As the factors having effects on the quality of life, the daily stress\cite{4}, the number of chronic diseases, depression, social support as social networks\cite{5}, and self-efficacy were presented. Once the social support was provided with the mediation of self-efficacy, the quality of life of the elderly got improved\cite{3}. Thus, when the degree of daily stress and depression was higher, the quality of life tended to be lowered, which showed the inverse correlations between stress and quality of life, and between depression and quality of life\cite{4,6}. When the self-efficacy is higher, the quality of life gets increased, so that it would be necessary to increase the self-efficacy. And it has been reported that the quality of life is high when the elderly perceive the receipt of social support\cite{3}. However, there are not many researches comprehensively reviewing such factors.

The purpose of this study is to establish the basic data for the development of nursing intervention necessary for improving the quality of life through the maintenance/enhancement of health of the elderly with chronic diseases, by analyzing the relations of those variables, and revealing the influence factors on the quality of life.

METHOD

1. **Subjects:** The subjects of this study are the elderly in their 60 or up with chronic diseases, actively working in religious institution and senior citizens center while residing in D metropolitan city, M, C, and G city. To verify the fitness of the sample size, the G*Power 3.1.9.4 program was used and a significance level of .05, effect size of .15, verification power of .80 and 11 predictive factors were applied to the regression analysis to acquire the final number of 111 subjects. Total 113 copies were used for the final analysis.

2. **Instruments:**

2.1. **Stress:** This study used the BEPSI-K which was modified/complemented by Lim, et al\cite{7}. Total 12 items are based on the 4-point Likert scale. The higher score means the higher degree of stress. When the tool was developed, the reliability was Cronbach’s $\alpha=.85$, which was .83 in this study.

2.2. **Depression:** This study used the Short Form Geriatric Depression Scale with 15 items, which was standardized into Korean-version short form geriatric depression scale by Kee\cite{8}. This tool has total 15 items based on the two-point scale like 0 or 1 point. The higher score means the higher degree of depression. When the tool was developed, the reliability was Cronbach’s $\alpha=.84$, which was .83 in this study.

2.3. **Self-efficacy:** This study used the general self-efficacy scale developed by Chen, Gully, & Eden\cite{9}, which was adapted by Noh\cite{10}. This tool has total eight items based on the 5-point Likert scale. The higher score means the higher degree of self-efficacy. In the research by Noh, the reliability was Cronbach’s $\alpha=.83$, which was .96 in this study.

2.4. **Social support:** This study used the scale used by Kim\cite{11} by modifying/complementing the MSPSS (Multi-dimensional Scale of Perceived Social Support). This tool has total 12 items based on the 5-point Likert scale. The higher score means the higher degree of social support. When the tool was developed, the reliability was Cronbach’s $\alpha=.90$, which was .94 in this study.

2.5. **Quality of life:** This study used the Korean-version WHO Quality of Life Short Form Scale developed by Min et al\cite{12}, which was modified/complemented by Shin\cite{13}. This tool has total 26 items based on the 5-point Likert. The higher score means the higher degree of the quality of life. In the research by Min et al, the reliability of this tool was .90, which was .94 in this study.

3. **Data collection & Ethical consideration:** Approval was acquired by the ethics committee of K University (KNU_IRB_2020_24). After explaining the research purpose and contents to the presidents of religious institutions and senior citizens centers in D metropolitan city, M, C, and G city, and then receiving their permission, the researcher and the trained research assistant explained the research purpose and how to fill out the questionnaire to elderly people, and then received the written consents. We collected data by reading the questions in the questionnaire to help them to complete the questionnaire. It took about 20-25 minutes to fill out the questionnaire.

Data Analysis: Using the SPSS 23.0 program, this study used the descriptive statistics like percentage for the general characteristics and the degree of variables, the t-test and ANOVA for comparing the quality of life of subjects according to the general characteristics, and the Scheffe test for post-test. This study also used Pearson correlational coefficients for the relations of variables,
and the stepwise multiple regression for analyzing the factors having effects on the quality of life.

**Results**

1. **General characteristics of subjects:** There were total 113 elderly people with chronic diseases, and they were suffering from various types of diseases such as hypertension, diabetes, heart diseases, joint diseases, respiratory diseases, nervous diseases, thyroid gland diseases, cerebral diseases, and hearing disorder. Subjects’ age was from 60 to 91, and the mean age was 72.01±7.65. The female elderly were more than the majority (n=80, 70.8%). The case of cohabiting with spouse was more than the majority (n=68, 60.7%). The graduation from middle school or higher was more than the majority (n=74, 66.1%). The number of mean diseases of subjects was 2.77±1.21. The case of having two diseases was 39.4% while the case of having three diseases was shown in 27 subjects (24.8%). Most of the cases responded to their health status as pretty good or average (n=91, 81.3%). The case of exercising regularly or sometimes was more than the majority (n=75, 66.4%). In case of doing exercise, total 18 subjects (25.4%) mostly walked everyday, and 21 subjects (30.4%) exercised for about 60 minutes each time. The exercise hours were evenly distributed from ten minutes to 120 minutes. The case of responding to their economic status as average was more than the majority (n=63, 55.8%).

2. **Degree of stress, depression, self-efficacy, social support, and quality of life of subjects:** The subjects’ stress scored 2.19 point out of 4 points, depression scored 0.37 point of 1 point, self-efficacy scored 3.03 point out of 5 points, social supports scored 3.54 point of 5 points, and quality of life scored 3.22 point out of 5 points [Table 1].

3. **Differences in the quality of life according to the general characteristics:** There were differences in the quality of life in the statistically-significant level according to the age (F=3.92, p=.023), relationship with spouse (t=4.17, p<.001), the number of diseases (F=8.82, p<.001), occupation (t=2.61, p=.010), health status (t=4.08, p<.001), exercise (t=4.14, p<.001), and economic level (F=11.34, p<.001).

4. **Correlations of stress, depression, self-efficacy, social support, and quality of life in subjects:** The stress (r=-.54, p<.001), the depression and quality of life (r=-.62, p<.001) of subjects showed such negative correlations while the self-efficacy (r=.68, p<.001), the social support and quality of life (r=.69, p<.001) showed such positive correlations [Table 2].

### Table 1. Degree of stress, depression, self-efficacy, social support, and quality of life of subjects

<table>
<thead>
<tr>
<th>Variables</th>
<th>M±SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress</td>
<td>2.19±0.57</td>
<td>1~4</td>
</tr>
<tr>
<td>Depression</td>
<td>0.37±0.33</td>
<td>0~1</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>3.03±0.96</td>
<td>1~5</td>
</tr>
<tr>
<td>Social support</td>
<td>3.54±0.78</td>
<td>1~5</td>
</tr>
<tr>
<td>Quality of life</td>
<td>3.22±0.64</td>
<td>1~5</td>
</tr>
</tbody>
</table>

### Table 2. Correlations of stress, depression, self-efficacy, social support, and quality of life in subjects (N=113)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Stress r(ρ)</th>
<th>Depression r(ρ)</th>
<th>Self-efficacy r(ρ)</th>
<th>Social support r(ρ)</th>
<th>Job competence r(ρ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>.58(&lt;.001)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>-.55(&lt;.001)</td>
<td>-.51(&lt;.001)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social support</td>
<td>-.65(&lt;.001)</td>
<td>-.63(&lt;.001)</td>
<td>.52(&lt;.001)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Quality of life</td>
<td>-.54(&lt;.001)</td>
<td>-.62(&lt;.001)</td>
<td>.68(&lt;.001)</td>
<td>.69(&lt;.001)</td>
<td>1</td>
</tr>
</tbody>
</table>

5. **Factors having effects on the quality of life in subjects:** To understand the factors having effects on the quality of life of subjects, this study conducted the multiple regression analysis by performing the dummy treatment on the age, spouse, number of diseases, occupation, health status, exercise, and economic status that showed the significant results in the general characteristics, and also the independent variables. Regarding the issue of multicollinearity expected in case when conducting...
In the multiple regression analysis, the tolerance limit was \(0.550-0.933\), which was higher than 0.1. The Variance Inflation Factors (VIF) were \(1.071-1.819\), which was not higher than the standard as 10, so that there was no problem with the multicollinearity. Also, the Durbin-Watson value was 2.068, so that there was no problem of autocorrelation.

In the results of analysis, the self-efficacy \((\beta=0.39)\), social support \((\beta=0.39)\), the number of diseases \((\beta=0.14)\), depression \((\beta=-0.18)\) and age \((\beta=0.13)\) had great effects on the quality of life of subjects, which showed \(68.0\%\) explanatory power [Table 3].

### Table 3. Factors having effects on the quality of life in subjects

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>SE</th>
<th>(\beta)</th>
<th>(t)</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>1.40</td>
<td>.27</td>
<td>5.195</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>.25</td>
<td>.05</td>
<td>.39</td>
<td>5.568</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Social support</td>
<td>.31</td>
<td>.06</td>
<td>.39</td>
<td>5.103</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Number of disease (one)</td>
<td>.30</td>
<td>.13</td>
<td>.14</td>
<td>2.363</td>
<td>.020</td>
</tr>
<tr>
<td>Depression</td>
<td>.33</td>
<td>.14</td>
<td>-.18</td>
<td>-2.305</td>
<td>.023</td>
</tr>
<tr>
<td>Age (70-79)</td>
<td>.17</td>
<td>.08</td>
<td>.13</td>
<td>2.196</td>
<td>.030</td>
</tr>
</tbody>
</table>

\(R^2 = .680\) Adj. \(R^2 = .664\) F = 42.431 \(p < .001\)

**References**: Number of disease = one, age = 60–69 years

## Discussion

In the results of this study, the subjects showed the inverse correlations between stress, depression and quality of life while showing the positive correlations between self-efficacy, and social support and quality of life. Such results accord with the results\(^5\) showing that the quality of life related to health of subjects had positive correlations with self-efficacy and social support. The daily stress and quality of life of the elderly in long-term care facilities had a negative correlation\(^4\), and the depression of female elderly at home showed the inverse correlation with the quality of life\(^6\). When the stress and depression of the elderly get higher, the quality of life could get lowered. And the social support of the elderly with disaster damage showed the positive correlation with the quality of life while the depression showed the inverse correlation with the quality of life\(^14\). With the mediation of resilience of the elderly, stress showed the indirect effects and partially-mediating effects on the quality of life. Therefore, it would be necessary to develop and vitalize the community health enhancement program. This study recommends to conduct a further research by adding a variable of self-efficacy with a meaning similar to resilience.

Also, the self-efficacy, social support, the number of diseases, depression, and age of subjects were the variables having effects on the quality of life, which showed 68.0% explanatory power. This was similar to the results\(^5\) of a study reporting that the age and self-efficacy had effects on the quality of life, and the social support had effects on the quality of life related to health with the mediation of self-efficacy. By considering Korean culture regarding family as important, this is similar to the results\(^13\) reporting that the family support had effects on the quality of life of the elderly. Thus, the social support from others might have very important effects on the quality of life. The effects of depression on the quality of life would be different depending on the level of social support\(^14\). It would be necessary to apply the nursing intervention for improving the quality of life to the self-efficacy programs, and it would be also helpful to provide the programs related to social support. The subjects are the elderly with one or more chronic diseases. Considering that the health status gets poorer when the age is higher, it would be needed to establish the support programs providing helps from family and experts, by increasing the self-care ability related to chronic diseases. The results were similar to the results\(^6\) of a study reporting that the depression of the female elderly at home had negative effects on the quality of life with the mediation of daily activities. It would be
necessary to seek for the measures for lowering the depression by researching the progress of diseases when the age gets higher.

The local governments and healthcare specialists should vitalize the volunteer activity programs targeting the elderly with chronic diseases in community, and also operate the physical/psychological healthcare programs for the elderly in which the residents could actively participate.

Conclusions

To improve the quality of life of the elderly with chronic diseases in daily life, it would be necessary to increase the self-efficacy which is confidence in abilities and also to encourage and support them all the time. Also, in order not to get exposed to more diseases in the current state, it would be needed to seek for the measures for educating and supporting in relation to disease control like medical check-up, daily life management, and use of medication, decreasing the feeling of depression, and giving a boost to live younger even when getting aged. This requires not only the efforts from the elderly, but also the active development and operation of programs by their families and experts. This study suggests a further research for revealing much more factors.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

References


Detection of Class 1 Integron-intI1 Associated with Neomycin and Ciprofloxacin Resistant Bacteria in Different Spots of Bay Receiving Sewage Water

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Abstract

In this study, Class 1 Integron co-associated with some antibiotics resistant bacteria was investigated from different spots on Izmir bay of Aegean sea as a first report about analysis and track of influences human and animal wastes on water environment in a period between July 2019 – January 2020.

Our results showed variations in Neomycin and Ciprofloxacin resistance bacteria, Neomycin resistance bacteria was detected in 100% of all sampling points ranged from 4.2×10^2 in (BOS) samples to 1.98×10^3 revealing wide distribution of Neomycin resistance bacteria in different spots on Izmir bay receiving sewage water.

Ciprofloxacin resistance bacteria founded in 25% of collected samples it was only founded in (BS) sampling point, Class 1 integron investigation, showed wide range distribution during sampling campaign among different sampling points, the main results showed that 75% of samples was positive to class 1 integron presence, it was founded in Balçova Ilica (BS), Melez (MS), Bornova (BOS) points with no appear in the fourth point Bostanli streams (BTS).

During the investigations we noticed that Class 1 integron elements was associated 100% with Neomycin resistance bacteria in four sampling points (BS, MS, BOS & BTS) while showed weak association with Ciprofloxacin resistant bacteria.

Keywords: Neomycin resistance bacteria, Class 1 integron, Izmir bay.

Introduction

Integrons, especially class 1 integron is a platform that allow capturing, storage, cleavage and re-arrangement of many genes in the same frame calling gene cassettes,Class 1 integron {intI1} possess genes encodes for producing of integrase factor. This element considers one of the most critical transportable genetic elements due to its role in the spreading of antibiotic resistance genes (ARGs) through horizontal gene transfer (HGT) between bacterial communities, facilitating their transfer into a wide range of pathogenic bacteria and carry antibiotic resistance genes from one bacteria to another bacterial cells imposing risks to public health(1-3).

Although Integrons similar to plasmids and transposons as a HGT element but different from theme by capability of capturing gene forming resistance gene cassettes incorporated into integron frame then enables
integrons to mobilizing across different microbial species making it to be predominantly associated with multi drug resistance-MDR gram-negative bacteria, also sometimes embedded in promiscuous transposons and plasmids(4-6).

Generally, class 1 integron composed of three main parts: an (intI1) gene encodes for integrase enzyme which enabling this platform to capture and expression of exogenous genes into second part (attI) called recombination site forming gene cassettes, third part is a promoter (P_C) catalyze inserted genes expression. (7-8)

There are many researchers reported that Class 1 integron exists in different environments with considerable sequence diversity Gillings et al. 2008b also previously reported to be the most abundant intI in Wastewater treatment plants without completely elimination by different treatment processes. In addition, investigated in Chicken Meat (9), ready-to-eat foods in China (10), Clinical isolates (11-12), prevalence in pigs and pork (13), founded in about of 81% of Escherichia coli isolates from waterfowls in China (14), recovered among fruits and vegetables (15) also detected in guts of Salmo salar fish farms (16) all these reports reveal the size of this element distribution.

The most interested point of class 1 integron is linking of this element not only with antibiotics resistance, also associated with heavy metals resistance genes making it responsible for disseminating of resistance from pathogenic microbes to environmental non-resistance microbes and spreading from its common origin gram-negative bacteria into gram-positive bacteria species(1-2; 7).

intI1 gene has a specificity to be a generic marker of anthropogenic produced pollution including high abundance in domestic animals and human’s bacteria, a consequently high representation in streams, based on these, many researchers have used of intI1 analysis to track animal & human influence on water environment(7).

Understanding the presence, origin and fate of these elements is important for the practical control of antibiotic resistance and for exploring how lateral gene transfer can seriously impact by human activities, also the association of this mobile gene element MGE with ARB can accelerate the dissemination of ARGs through HGT in the water environment making the problem of antibiotics resistance more sever(17).

However, due to limited data are available on the class 1 integron distribution and its association Ciprofloxacin-Neomycin Resistant bacteria in entire Turkey and no previous investigations about prevalence of class 1 integrons in Izmir bay therefore, we started screening this element presence to determine the range of distribution from sewage water to Izmir bay and recording a first documentation to serve in future works regarding to antibiotic-resistant bacteria (ARB) and ARGs associated with class 1 integron.

Material and Method

Study area and Samples processing: Izmir Bay (also Smyrna golf) is located on Aegean Sea in Izmir city between 38° 18’ 00’ - 38° 43’ 00” latitudes and 26° 23’ 00’ – 27° 11’ 00” longitudes. Its length 64 km by 32 km in breath. About 20 streams flowing into the inner part of the Izmir Bay. Samples collected from Balçova Ilica (BS), Melez (MS), Bornova (BOS) and Bostanli streams (BTS) as marked in figure(2-A, B, C, D).

Grab sampling method applied for collecting of samples in a period between July 2019 – March 2020 water samples were brought to the laboratory in a freezer in glass container and stored in the refrigerator at + 4°C for further investigations.

Antibiotics resistant bacteria (ARB) counting: Bacterial counting was performed to test phenotypic resistance of both Neomycin and Ciprofloxacin resistance. R2A agar + interested antibiotic solution and plate pouring method was applied to perform this step following standard protocol of Clinical and Laboratory Standard Institute - CLSI instructions(18-19).

Antibiotic solutions were Neomycin:10 μg and ciprofloxacin:5 μg. Both of them were sterilized by 0.22 μM Millipore filters and added to R2A agar before pouring.

DNA extraction and manipulation: Total DNA was extracted directly from water samples using commercial Kit (NorGenbiotek™ Canada) following the manufacturer’s instructions. All DNA extracts were checked for its quality on 1 % of gel electrophorese and Nanodrop™.

Primers & PCR reaction: The occurrences of class 1 integron in the water samples were first determined using convenient PCR, the PCR running conditions is presented in Table 1. Specific primers were ordered
from Genaid™, all primers were analyzed by BLAST program, these quences and other details of the primers showed in Table 2.

PCR program was done as following steps: initial (ID) at 94°C for 3 min, followed by 30 cycles of denaturing (D) at 94°C for 30 s, annealing (ANN) was 64°C for 1 min, and elongating (EL) at 72°C for 90 s, final elongation was at 72°C for 5 min. All PCR products were run on the agarose gel electrophoresis again to see int1 bands. detection and characterization of class 1 integron was performed as described previously by (20-21).
A: Balçova Ilica stream, B: Melez stream, C: Bornova stream, D: Bostanlı streams.

Table (1): Primers used in the study

<table>
<thead>
<tr>
<th>Primers PCR steps</th>
<th>aph (3’)-Ila (Neomycin)</th>
<th>qnrS (Ciprofloxacin)</th>
<th>IntI1 Class 1 integron</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial denaturation</td>
<td>95˚C 2 Mn</td>
<td>95˚C 2 Mn</td>
<td>94˚C/3Mn</td>
</tr>
<tr>
<td>Denaturation</td>
<td>95˚C 30 S 30 cycle</td>
<td>95˚C 30 S 30 cycle</td>
<td>94˚C/30 s 30 cycle</td>
</tr>
<tr>
<td>Annealing</td>
<td>60˚C 30 S 30 cycle</td>
<td>61 30 S 30 cycle</td>
<td>64˚C 1 Mn 30 cycle</td>
</tr>
<tr>
<td>Elongation</td>
<td>72˚C 30S 30 cycle</td>
<td>72 30S 30 cycle</td>
<td>72˚C 90 S 30 cycle</td>
</tr>
<tr>
<td>Final elongation</td>
<td>72˚C 5 Mn</td>
<td>72˚C 5 Mn</td>
<td>72˚C 5 Mn</td>
</tr>
</tbody>
</table>

Table (2): PCR reaction steps and conditions

<table>
<thead>
<tr>
<th>Resistance gene</th>
<th>Primer name</th>
<th>Primer sequence</th>
<th>Amplicon size</th>
<th>Ancealing C</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1 integron</td>
<td>Int I1</td>
<td>5’- GTTCGGTCAAGGTTCTG 3’ 5’- GCCAACTTTCAGCACATG 3’</td>
<td>923</td>
<td>50</td>
<td>(21)</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>qnrS</td>
<td>F: ATCAAGTGAGTAATCGTATGTACT R: CACCTCGACTTTAAGTCTAGC</td>
<td>171 bp</td>
<td>61</td>
<td>(22)</td>
</tr>
<tr>
<td>Amikacin/Neomycin</td>
<td>aph(3’)-Ila</td>
<td>F: ATGATTGAAACAGATGGATTGC R: TCAGAAGAACTCGTCAAGAAGG</td>
<td>795bp</td>
<td>60</td>
<td>(23)</td>
</tr>
</tbody>
</table>

Results and Discussion

The presence of Neomycin and ciprofloxacin resistance bacteria with class 1 integron consider strong relationship for anthropogenic effects of antibiotic resistance bacteria on water environment especially natural water resource like our sampling spot in Izmir bay that receive sewage water contain different antibiotic resistance bacteria and transposable elements like class 1 integron.

As well as using of Neomycin in clinical it’s also used in veterinary field for the treatment of diseases in sheep, cattle, goats and swine, so, the presence of this antibiotic associated with class 1 integron consider marker for pollution of sewage water with animal related waste which increase the impact on normal flora of sea water. The same issue with Ciprofloxacin, a fluoroquinolone antibiotic used in clinical and animal like dogs and cats for control diseases, even its isolated from poultry products(24) may play a role as marker of...
pollution by animal products wastes that may discarded into some sewage that finally flowed into sea water by streams.

Our results showed variations in Neomycin and Ciprofloxacin resistance bacteria, Neomycin resistance bacteria was detected in 100% of all sampling points ranged from $4.2 \times 10^2$ in (BOS) samples to $1.98 \times 10^8$ revealing wide distribution of Neomycin resistance bacteria in different spots on Izmir bay receiving sewage water.

Ciprofloxacin resistance bacteria founded in 25% of collected samples it was only founded in (BS) sampling point; this result is much lower than neomycin resistance bacteria in our work area may be due to using of Neomycin more than ciprofloxacin especially in veterinary uses.

In other work by(25) reported that all strains, except SI40 strain were resistant to Neomycin and other tested antibiotics for samples isolated from chicken broils.

As we explained until now there is no previous works on the same antibiotics resistance to make a compression but there are some works related to the same antibiotics in other project(24) founded that among all isolates tested 91.4% were phenotypically resistant to ciprofloxacin(26) Kuang et al. 2018 reported that about 2.23% of water samples was resistant to ciprofloxacin while no resistance record for isolates investigated by Abbasoglu and akcelik in the same work discussed above.

The resistance to Ciprofloxacin (fluoroquinolones) is mainly related to amino acids substitutions in the quinolone resistance determining region - QRDR in ciprofloxacin resistance gene (27) this case confirmed by(28) when they observed amino acid change that lead to ciprofloxacin resistance.

Regarding to genotypic resistance characterization our results not matched with Neomycin and Ciprofloxacin appeared phenotypic resistance this may due to inhibitors founded in sewage water samples.

Class 1 integron investigation, showed wide range distribution during sampling campaign among different sampling points, the main results showed that 75% of samples was positive to class 1 integron presence, it was founded in Balçova Illica (BS), Melez (MS), Bornova (BOS) points with no appear in the fourth point Bostanli streams (BST) figure(3), these points may adjacency with some animal farms and mini livestock breeding houses that may discharge their waste to these streams, especially results not appeared at fourth sampling point (BST) for all sampling campaign.

During the investigations we noticed that Class 1 integron elements was associated 100% with Neomycin resistance bacteria in four sampling points (BS, MS, BOS & BTS) while showed weak association with Ciprofloxacin resistant bacteria.

![Fig. (3): PCR amplification products image on 1.5 % agarose gel electrophoresis for class 1 integron using specific primer for different sampling spots, M; DNA ladder (100 bp), BS: Balçova Illica stream, MS: Melez stream, BOS Bornova stream (900-923 bp) prospectively.](image_url)
The relationship of class 1 integron with Neomycin–Ciprofloxacin resistant bacteria and other antibiotics resistance discussed in many previous reports. (29) Li et al 2013 observed strong relationship of Class 1 integron and resistance to a variety of drugs like ciprofloxacin (both phenotypes and genotypic). among 176 isolates of Klepsiella pneumoniae class 1 integron positive isolates exhibited resistance to number of drugs as much as higher than those negative isolates that miss to integron also the extensively drug resistant isolates and including those located outside and within of frame was significantly higher among class 1 integron positive isolates.

The worst point of association between integron and antibiotic resistance is persistence in the polluted water even after treatment, (30) Wang et al 2019 demonstrated that the wastewater treatment systems could not completely able to remove the antibiotic resistance genes that associated with mobile genetic material like integrons, as a results probably be transferred into human forming great threats on public health.

Conclusion

The increasing amount of antibiotics using in clinical and veterinary field consider the basic reason for dissemination of antibiotics resistance, the worst point of this problem when disseminate by mobile genetic elements harbor many resistance genes cassette like class 1 integron.

The expanding of articles submissions concerned with class 1 integrons genes indicates that this situation is evolving and poses a potential clinical problem that could get more complex to be solved in advance.

In conclusion this study represents the first report showing screening of integron associated with some antibiotics resistance in Izmir bay, the investigations showed that the variations of Neomycin and Ciprofloxacin resistance bacteria, revealing wide distribution of Neomycin resistance bacteria in different spots on Izmir bay receiving sewage water.

Ciprofloxacin resistance bacteria was only founded in (BS) sampling point; this result is much lower thane neomycin resistance bacteria in our work area may be due to using of Neomycin more thane ciprofloxacin especially in veterinary uses.

wide range distribution of Class 1 integron in Balçova Ilica (BS), Melez (MS), Bornova (BOS) pointsmay adjacency with some animal farms and mini livestock breeding houses that may discharge their waste to these streams, especially results not appeared at fourth sampling point (BST) for all sampling campaign.

Finally, tested parameters may be changed with different seasons or in case establishment of waste water treatment systems before discharged into this bay.

Ethical Clearance: Not required

Conflict of Interest: No conflict of interest.

Source of Funding: Self

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The Effectiveness Meaning of Life and Antiretroviral Therapy (Metart) Modul to Improve Antire to Viral Therapy Adherence among Newly Diagnosed HIV/AIDS: Pre Intervention Survey

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Abstract

Adherence to ART is the primary determinant of viral suppression. Adherence of at least 95% is needed for optimal suppression. One of relationship with HAART is meaning in life. This study aimed at assessment meaning in life and adherence antiretroviral therapy before intervention about METART book.

This method use descriptive statistic analysis to explain social demographic, meaning in life, and adherence antiretroviral therapy.

The Result: Characteristics gender people new living with HIV/AIDS this study is 75.6% is Male with 38.5% homosexual. The age range of respondents is in the adult (65.4%). Single merital status is 74.4%. The total respondent with ARV medication is 30.8% under one year. 74.4% has meaningful life but 65.4% respondent has lack adherence ARV.

Conclusion: This research get data pre intervention METART modul about demographic, meaning in life, and adherence ARV.

Keywords: Adherence ART, meaning of life, HIV/AIDS.

Introduction

Adherence to ART is the primary determinant of viral suppression and the risk of transmission it decreases the viral replication and viral load which in turn preserves the CD4 level, decreases the progress of AIDS, and reduces deaths(1). Adherence of at least 95% is needed for optimal suppression(2,3). Antiretroviral therapy has an impressive clinical effect in that WHO has a target that 90% of People Living with HIV/AIDS (PLWHA) already underwent ART by 2016, but the target realization is only 53%. From year to year, PLWHA who undergo antiretroviral therapy is increasing. In 2016, there are 19.5 million or about 53% of the total number of PLWHA, and in mid-June 2017 the number has progressed to 20.9 million or about 56.9% of the total number of PLWHA(3,4). Although adherence is important to the outcomes of therapy(5).

Out of 231 respondents in Nepal, 87.4% (95% CI: 83.2–91.6%) of them had an optimal adherence level and 12.6% of the respondents had an adherence level less than the opti-mal within the last month. i.e. 87.4% of the respondents’ attained 95% adherence to...
prescribed ART regimen\(^3\). Results of the evaluation of adherence to ART in Brazil using CEAT-VIH indicated that 50% (109/220) of the patients presented good adherence, 36% (79/220) presented strict adherence, and 14% (32/220) presented low adherence\(^6\). Based on the results research in Iran, 30.4% (65) of patients were non-adherent and 69.6% (149) showed good adherence to their medication protocols. The most important reason for discontinuation of medication was the patients’ unknown personal reasons (n=60, 61.2%), from the non-adherence group\(^7\). Many determinant factors to present non-adherence; quality of life, distress psychology, meaning in life, self-efficacy, peer group, economy, health worker, stigma, motivation, gender\(^3,7–11\).

Effect of non-adherence ARV increases mortality and morbidities. HIV/AIDS has effect to biological, psychological, social, and spiritual. Thus, prevention of co-morbidities, improving knowledge through health education. Psychoeducation should be conducted at the initial evaluation to reduce negative beliefs regarding antiretroviral therapy. Assessment of anxiety and depression symptoms should be done throughout therapy as both psychological conditions are associated with patient adherence, success of treatment, and ultimately with patients’ quality of life. This study researcher will be increasing of meaning in life to increasing adherence ARV people living with HIV/AIDS.

**Material and Method**

The study protocol and consent procedures were reviewed and approved by the Institutional Review Boards of Sekolah Tinggi Ilmu Kesehatan Ngudia Husada Madura with number of ethical clearance 709/KEPK/STIKES-NHM-/EC/IX/2020. In accordance with the approved protocol, written informed consent was obtained from all study participants prior to data collection. This study is assessment pre intervention of meaning in life and antiretroviral therapy (METART) to promoting adherence antiretroviral therapy. Researcher use meaning in life questionnaire Indonesian version\(^12\) and Morisky 8-scale\(^13\) to assessment meaning in life and adherence antiretroviral therapy. Data analysis, descriptive statistic\(^14–16\) were used to determine statistical differences in demographic variables (i.e., gender, education, marital status, CD4 status, Viral load status, Sexual orientation), meaning in life and adherence ART.

**Result and Discussion**

**Demographic Characteristics**: A total of 78 PLWHAs were invited to participate in the study. Demographic Characteristics Are gender, sexual orientation, age, education level, marital status, ARV medication, CD4 status, and viral load status (Table 1).

| Table 1.1: Demographic Characteristics people new living with HIV/AIDS n=78 |
|---------------------------------|-----------------|----------------|
| **Demographic data** | **Frequency (n)** | **Percent (%)** |
| **Gender** | | |
| Female | 16 | 20.5 |
| Male | 59 | 75.6 |
| Other | 3 | 3.8 |
| **Total** | 78 | 100 |
| **Sexual-orientation** | | |
| Heterosexual | 26 | 33.3 |
| Homosexual | 30 | 38.5 |
| Bisexual | 15 | 19.2 |
| Other | 7 | 9 |
| **Total** | 78 | 100 |
| **Age** | | |
| Adolescent | 24 | 30.8 |
| Adult | 51 | 65.4 |
| Elderly | 3 | 3.8 |
| **Total** | 78 | 100 |
| **Education-level** | | |
| Middle-elementary school | 7 | 9 |
| High school | 50 | 64.1 |
| Undergraduate | 20 | 25.6 |
| Postgraduate | 1 | 1.3 |
| **Total** | 78 | 100 |
| **Merital status** | | |
| Sigle | 58 | 74.4 |
| Meried | 16 | 20.5 |
| Window/windower/divorce | 4 | 5.1 |
| **Total** | 78 | 100 |
| **ARV-Medication** | | |
| 0-6 months | 18 | 23.1 |
| 7-12 months | 24 | 30.8 |
| 13-18 months | 17 | 21.8 |
| 19-24 months | 19 | 24.4 |
| **Total** | 78 | 100 |
### Table 1: Demographic data

<table>
<thead>
<tr>
<th>Cd4-Status</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;200</td>
<td>13</td>
<td>16.7</td>
</tr>
<tr>
<td>200-300</td>
<td>13</td>
<td>16.7</td>
</tr>
<tr>
<td>300-400</td>
<td>20</td>
<td>25.6</td>
</tr>
<tr>
<td>400-500</td>
<td>14</td>
<td>17.9</td>
</tr>
<tr>
<td>&gt;500</td>
<td>11</td>
<td>14.1</td>
</tr>
<tr>
<td>I don’t know</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>78</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

### Table 2: Viral load status

<table>
<thead>
<tr>
<th>Status</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detections</td>
<td>16</td>
<td>20.5</td>
</tr>
<tr>
<td>Un-detections</td>
<td>22</td>
<td>28.2</td>
</tr>
<tr>
<td>I don’t know</td>
<td>40</td>
<td>51.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>78</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Characteristics gender people new living with HIV/AIDS this study is 75.6% is Male with 38.5% homosexual. Homosexual is romantic sexual attraction, behavior with same sex\(^{(17)(18)(19)}\). The age range of respondents is in the adult (65.4%) age range which is above 25-45 where this age is a productive to developmental task of choosing a job and marriage. This time is also a time to build the peak structure of life \(^{(20)}\). Siglemerital status is 74.4%. the total respondent with ARV medication is 30.8% under one year. Almost respondent have CD4 under 500, a normal CD4 cell count is about 500 until 1,500 cells/\(\text{mm}^3\). Clinicians use this test to monitor the destruction of CD4 cells, and it also monitors the effectiveness of the antiretroviral treatment (ART). For a physician, the CD4 cell count has become the best indicator of disease progression and is used to stage disease and guide medical therapy. Per the Center for Disease Control and Prevention (CDC), one of the indications for the diagnosis of AIDS is when CD4 cell count drops below 200 cells/\(\text{mm}^3\). The decline of CD4 T cells can lead to opportunistic infections, and it increases mortality. The results of a viral load test are described as the number of copies HIV RNA in a milliliter of blood, when somebody has undetected of viral load is described if the copies of HIV RNA of blood in very low and its good for healthy\(^{(10,11)}\).

**Meaning of Life:** The result showed 74.4% people with newly diagnosed HIV/AIDS had meaningful life (Tabel 2).

Meaning of life is comprehended from every event that occurred and experienced both pleasant and distressing events. It will bring a person into a meaningful life so that the feeling of happiness will emerge, on contrary it can lead one to a meaningless empty life if they unsuccessful\(^{(23–25)}\). Meaning of life had a different function for each individual, but according to Mackenzie & Baumeister (2014), the function of meaning in life could be divided into three function themes\(^{(26)}\). The first function was to help someone in recognizing and discussing signs and patterns in the environment. The second function was for communication. The third function was for self-control. The meaning of life according to Starck (2014), was said to be the phase where a person reached his life goal\(^{(27)}\). The meaning of life have correlations with adherence ARV\(^{(11)}\).

**Table 2: Meaning of life people living with HIV/AIDS n=78**

<table>
<thead>
<tr>
<th>Meaning of Life</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meaningfull life</td>
<td>58</td>
<td>74.4</td>
</tr>
<tr>
<td>Low meaning in life</td>
<td>20</td>
<td>25.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>78</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Adherence antiretroviral therapy:**

**Table 3: Adherence antiretroviral therapy n=78**

<table>
<thead>
<tr>
<th>Adherence antiretroviral therapy</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High adherence</td>
<td>27</td>
<td>32.6</td>
</tr>
<tr>
<td>Middle adherence</td>
<td>26</td>
<td>33.3</td>
</tr>
<tr>
<td>Low adherence</td>
<td>25</td>
<td>32.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>78</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

From the research results obtained that 59 respondents or 57.8% were adherence to antiretroviral therapy and the rest did not comply as much as 43 respondents or 42.2%. This level of adherence was seen from the accuracy of the dosage and the frequency of time-consuming ARV. The non-adherence of respondents based on the questionnaires due to forgetting to take the drugs by 26.5% and difficult to remember to consume the drugs by 28.4%.

ART treatment has the potential to reduce mortality and morbidity that associated with HIV infection, and improve the quality of life \(^{(28,29)}\). A person is said to be adherent in undergoing an optimal antiretroviral therapy if (>95%) never forgets to take the drug, but it is recommended that the adherence is (100%). According toBangsberg, Kroetz, & Deeks, (2007), ART adherence should be observed to discern the compliance level of the
treatment, as some studies indicate that with treatment adherence of (95%) or more indicates the effectiveness of antiretroviral therapy\(^{(30)}\), but on adherence (75%) shows a rise of viruses with retention against drugs\(^{(31)}\). Some patients fail to maintain ART adherence\(^{(32)}\). Optimal ART adherence was significantly associated with being virally suppressed\(^{(1,7,9,10)}\).

Many factors to associate ART is motivation on the relationship between HIV stigma and ART adherence\(^{(10)}\).

**Conclusion**

Characteristics of participants ages from 18 to 54 years, 75,6% identified as Male, 64,1% had completed high school, 74,4% sige, 38,5% identified as homosexual and 30,8% pastisipants had ART medication under one year. The participant reported 74,4% was having meaningful life and 65,4% reposted had lacked ART Adherence.

**Conflict of Interest:** The Authors declare that there is no conflict of interest.

**Acknowledgments The and Source of Funding:** We thanks to the staff from NGOs Victory Plus Yogyakarta for the support and dedicated to all the participants who made this study posibble. This work was funded by Ministry of Research and Technology/Nasional Research and Innovation Agency of the Republic of Indonesia.

**Ethical Clearance:** This research is not conflict of interests with ethical clearance No;709/KEPK/STIKES-NHM/EC/IX/2020.

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**Triple Drug Therapy with Proton Pump Inhibitor a Better Option for Helicobacter Pylori Eradication**

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**Abstract**

H. pylori is a gram-negative micro organism residing in the stomach of human. It is a important cause of acid peptic disorders. Bismuth based triple therapy, triple therapy regimens (Triple PPI) and Quadruple therapy are the available treatment options to eradicate H. pylori. Controversy still presents regarding the superiority of treatment modality and results of available studies are variable. Hence this study was undertaken to evaluate and compare the efficacy of triple PPI, Quadruple therapy, and bismuth-based triple therapy in treating acid peptic disorders and Helicobacter pylori eradication. Methode: This study was a prospective interventional. After the establishment of a clinical diagnosis of the acid peptic disorder, the patient was posted for endoscopy. H. pylori status was determined by the rapid urease test and culture examination. All patients divided into three groups and offered three different medical treatments the first group received bismuth bases triple therapy, the second group got Tripple PPI therapy and the third one received quadruple therapy. efficacy and comparison of all these treatment modalities were evaluated and assessed by symptoms, endoscopic findings, and results of the rapid urease test after 6 weeks. Results: In the present study, 150 patients with upper gastrointestinal symptoms were studied It was found that the maximum number of subjects belonged to the age group 31-40 yrs. Male outnumbers than females. Maximum patients had pain in epigastric region and were having gastritis as a commonest diagnosis., Symptomatic relief by Triple therapy with PPI was maximum than other therapies. Rapid urease test (RUT) was also suggest that treatment with it gives superior eradication rates. Discussion: In our study, we have found that the treatment regime with PPI Triple therapy has given maximum symptomatic relief, there is an association of H. Pylori infection in an acid peptic disorder like duodenal ulcer (86.66%), gastric ulcer (75%), and gastritis (82.85%). the efficacy of the Rapid urease test is 66% and that of culture is 38.66% in the diagnosis of H. pylori infection in acid peptic disorder. Conclusion: PPI Triple therapy is most effective in symptomatic relief and healing of the duodenal and peptic ulcer.

**Keywords:** Gastritis, rapid urease test, dyspepsia, tetracycline.

**Introduction**

The acid peptic disorder is a disorder in which due to hyperacidity, there is the damage of inner lining (mucosa) of the stomach and duodenum causing various manifestations like inflammation, ulcer, etc. A major symptom of the acid peptic disorder is a pain in the abdomen typically non radiating, burning, and located at in epigastrium, Other include nausea, vomiting, dyspepsia, haemtemesis, and melena, etc. Upper gastrointestinal tract disorders are common in surgical practice. A disease of the stomach and duodenum range from a benign disease like gastritis, peptic ulcer diseases which are usually having a self-limiting although a prolonged course with a potentially dangerous complication like perforation with its attendant’s peritonitis both chemical and bacterial, to malignant diseases like carcinoma of the stomach. The upper gastrointestinal disease forms
a major part of the total number of patients attending the outpatient clinic for gastrointestinal disorders. The treatment of peptic ulcers has been based on Schwartz dictum “No acid, no ulcer”. Marshall and Warran in 1984 described microorganisms in the stomach of patients with gastritis and peptic ulceration first time in history. These investigators identified a spiral-shaped flagellated organism associated with peptic ulcer originally referred to as campylobacter pyloride. The organism is now known as Helicobacter Pylori.

H. Pylori is a gram-negative organism resides in the stomach of human and other animals, affecting half of the population of world.

H. Pylori is a common cause of peptic ulcer of stomach and duodenum leading to clinically present as recurrent abdominal pain. It is correlated with around 90% of duodenal ulcers and 80% of gastric ulcers, major cause of morbidity. Mortality associated however is low but can result in chronic illness leading to significant manpower loss. It can also cause lymphoma and gastric carcinoma.

Present understanding about the aetiology of peptic ulcer disease, gastric cancer, and dyspepsia is under evolution. The invention of Helicobacter pylori as an infective agent change our method to treat and diagnose it. Human beings are the only reservoir for Helicobacter Pylori. Direct transmission from person to person occurs via saliva and feces and infection also through contact with contaminated water.

The Nobel prize in physiology or medicine for the year 2005 was awarded to both J. Robin Warren and Barry Marshall. These Nobel winners made an astonishing and unbelievable invention that chronic inflammation in stomach and duodenum (Gastritis, gastric and duodenal ulcer), is due to an infection by bacterium H.Pylori. Many tried to disprove it. As recent trend of decrease evidence of peptic ulcers was observed from last 40 years. The discovery of Helicobacter Pylori had a further major impact on the incidence of ulcer.

Bismuth based triple therapy comprising of colloidal bismuth subcitrate (120 mg, q.i.d), tetracycline (500 mg, q.i.d) and metronidazole (400 mg, t.i.d) for 14 days is low cost, safe and have high success rates in metronidazole sensitive strains. Few investigators reveals upto 90 percent success rate. If tetracycline was replaced by amoxicillin then success rate decreased to 70 percent to eradicate H.pylori. Triple therapy (Tripple therapy with PPI) is a combination of a proton pump inhibitor and two antibiotics have now almost replaced the use of the classical bismuth-based triple therapy in all over world. This is due to less side effect and better eradication rate. Quadruple therapy is a try to get 100% removal of H. pylori by the addition of anti-secretory agents to the classic bismuth-based triple therapy. It has been noted that this quadruple treatment is more effective when a PPI is used as an anti-secretary agent rather than an H2 receptor antagonist. Huang et al reported a promising eradication rates of 95% when omeprazole was added to the classical triple therapy.

Controversy still presents regarding the superiority of treatment modality and results of available studies are variable. Hence this study was undertaken to evaluate and compare the efficacy of triple PPI, Quadruple therapy, and bismuth-based triple therapy in treating acid peptic disorders and Helicobacter pylori eradication.

Method

The present study was undertaken in the department of surgery, Jawaharlal Nehru Medical College, Wardha in collaboration with Datta Meghe Medical College Hingana, Nagpur, Datta Meghe Institute of medical science (DMIMS), Sawangi, Meghe, Wardha, Maharashtra India. This study was a prospective interventional. The duration of this study was from September 2018 to September 2019. The numbers of patients were 150.

Sample size- 150

The sample size was calculated as per formula was around 134. Hence 150 sample size was sufficient.

\[
N = \frac{(Z_{\alpha} + Z_{1-\beta})^2 \sigma^2}{\Delta^2}
\]

The present study was carried out on the patients attending surgical OPD as well as the surgical ward from September 2018 to September 2019 in a tertiary center. We selected 150 patients having gastrointestinal complaints. The complaints were a pain in the abdomen, usually, in the epigastric region, dyspepsia, nausea, vomiting, haematemesis, melena, etc. Detail history of patients was taken with regards to the symptom, their duration, and severity, other complaints, drug history. A thorough clinical examination and routine haematological examination of patients was done. After the establishment of a clinical diagnosis of the acid peptic disorder, the patient was posted for endoscopy. H. pylori status was determined by the rapid urease test and histopathological examination.
Inclusion Criteria: Patients between 15-60 years were having symptoms of the acid peptic disorder.

Exclusion Criteria:
1. Patients taking antibiotics and bismuth compounds or omeprazole 4 wks before endoscopy
2. Pregnancy.

Detail of procedure followed: Patients with clinical symptoms of APD were advised to attend the Gastroscopy clinic. The patients were kept nil orally at night and were advised to attend endoscopy clinic early in the morning. Endoscopy was performed with Fujinon Gastroduodenoscope after obtaining informed consent. Esophagogastroduodenoscopy of each patient was done under surface local anesthesia with 4% Xylocaine viscous. Findings were noted and biopsies from the antrum and suspicious lesions were taken. Out of biopsies, one was subjected for a rapid urease test and the second biopsy specimen was used for histopathological examination. Endoscopic findings were recorded as gastritis, duodenal ulcer, gastric ulcer, gastric carcinoma, and endoscopically normal mucosa as per standard criteria.

All patients divided into three groups and offered three different medical treatments the first group received bismuth bases triple therapy, the second group got Tripple PPI therapy and the third one received quadruple therapy. Efficacy and comparison of all these treatment modalities were evaluated and assessed symptoms, endoscopic findings, and results of the rapid urease test after 6 weeks.

Data Collection: The data collected included the presenting complaints, clinical signs, endoscopic findings, results of rapid urease test, and histopathological examination.

Statistical Analysis: The presence of H pylori infection was correlated with symptoms, and endoscopy findings. This calculation was derived using SPSS 17.0 statistical software.

Ethical approval for the study was obtained from the ethics committee of DMIMS University.

Results

In the present study, 150 patients with upper gastrointestinal symptoms were studied. It was found that the maximum number of subjects belonged to the age group 31-40 yrs. i.e. 26.66% followed by age group 21-30 yrs. i.e. 22.66%. It was found that of subjects male 112 and female 38. M: F 2.94:1. It was found that maximum no. subjects had pain in epigastric region 120 cases i.e. 80% followed by symptoms nausea 75 cases i.e. 50%.

Table 1: Endoscopic findings in patients with acid peptic disorder before treatment

<table>
<thead>
<tr>
<th>Endoscopic findings</th>
<th>No. of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastritis</td>
<td>70</td>
</tr>
<tr>
<td>Duodenitis</td>
<td>09</td>
</tr>
<tr>
<td>Duodenal ulcer</td>
<td>15</td>
</tr>
<tr>
<td>Gastric ulcer</td>
<td>08</td>
</tr>
<tr>
<td>Gastric malignancy</td>
<td>02</td>
</tr>
<tr>
<td>Endosc. Normal mucosa but clinically symptoms of APD</td>
<td>46</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
</tr>
</tbody>
</table>

70 patients were having gastritis, 15 had a duodenal ulcer, 9 patients had Duodenitis, the gastric ulcer was found in 08 patients, gastric malignancy in 02 patients and 46 patients had endoscopic normal mucosa. The highest positivity of RUT was seen in patients of duodenal ulcers (86.66%), followed by gastritis (82.85%) and gastric ulcer (75%).

Table 2: treatment regimen given in acid peptic disorder

<table>
<thead>
<tr>
<th>Regimen</th>
<th>No. of patients</th>
<th>Symptomatic relief</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bismuth Triple Therpy</td>
<td>38</td>
<td>24</td>
<td>60.52</td>
</tr>
<tr>
<td>PPI. Triple Therpy</td>
<td>82</td>
<td>78</td>
<td>95.12</td>
</tr>
<tr>
<td>Quadruple Therpy</td>
<td>30</td>
<td>22</td>
<td>73.33</td>
</tr>
</tbody>
</table>

Symptomatic relief with PPI Triple therapy was 95.12%, followed by Quadruple Therapy in 73.33% and Bismuth triple therapy 60.52%.

Table 3: Gastroscopic findings after six weeks of treatment

<table>
<thead>
<tr>
<th>Endoscopic finding</th>
<th>No. of cases improved</th>
<th>%</th>
<th>No. of cases not improved</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastritis</td>
<td>63</td>
<td>90</td>
<td>07</td>
<td>10</td>
</tr>
<tr>
<td>Duodenitis</td>
<td>08</td>
<td>88.88</td>
<td>01</td>
<td>11.11</td>
</tr>
<tr>
<td>DU</td>
<td>14</td>
<td>93.33</td>
<td>01</td>
<td>6.66</td>
</tr>
<tr>
<td>GU</td>
<td>06</td>
<td>75</td>
<td>02</td>
<td>1.25</td>
</tr>
<tr>
<td>GM</td>
<td>01</td>
<td>50</td>
<td>01</td>
<td>50</td>
</tr>
</tbody>
</table>
Out of a total of 150 patients who received treatment, 134 patients (89.34%) improved and 16 (10.66%) patients not improved.

Table no. 4: The result of rapid urease test and culture before treatment

<table>
<thead>
<tr>
<th>Test</th>
<th>Positive</th>
<th>%</th>
<th>Negative</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid urease test</td>
<td>99</td>
<td>66</td>
<td>51</td>
<td>34</td>
</tr>
<tr>
<td>Culture</td>
<td>58</td>
<td>38.66</td>
<td>92</td>
<td>61.33</td>
</tr>
</tbody>
</table>

RUT test was positive in 66% of patients and negative in 34% of patients. Culture was positive in 38.66% patients and negative in 61.33% patients.

Table no. 5: The result of rapid urease test and culture after treatment

<table>
<thead>
<tr>
<th>Test</th>
<th>Positive</th>
<th>%</th>
<th>Negative</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid urease test</td>
<td>15</td>
<td>10</td>
<td>135</td>
<td>90</td>
</tr>
<tr>
<td>Culture</td>
<td>12</td>
<td>8</td>
<td>138</td>
<td>92</td>
</tr>
</tbody>
</table>

RUT test was positive in 10% of patients and negative in 90% of patients. Culture was positive in 8% patients and negative in 92% patients. 6 patients from bismuth-based treatment group, 5 patients from quadruple, and 4 from the Tripple PPI treatment group.

Discussion

In this study, 150 patients (112 men and 38 women), within the range of 15 to 72 years, with symptoms suggestive of acid peptic disorder, were included.

In our study, we found that acid peptic disorder was more common in the age group 31-40 years (26.66% cases). Followed by 21-30 years (22.66% cases) and 41-50 years (17.33% cases). In our study in patients with acid peptic disorder rapid urease test was positive in 99 patients (66%).

In present study, the result with 3 different modalities of treatment was used as follows Bismuth triple therapy symptomatic relief in 34 patients (89.43%), PPI Triple therapy in 76 patients (92.68%) and Quadruple therapy in 28 patients (93.33%).

As per another study by Vikram Kate (2005) Bismuth therapy was used symptomatic relief in 30 – 90% patients, PPI triple therapy in 85-95% patients, and Quadruple therapy in 86-98% patients.

In present study, we found gastroscopic findings were improved 134 patients (88.93%) and not improved 16 patients (10.66%) after six weeks of treatment.

the cure rate of 80-85 % was achieved using combination therapy. Richard Guan et al, showed eradication of H. Pylori in 90% cases after a week with a triple regimen.

The present study was carried out on the patients attending surgical OPD as well as admitted patients in the ward who had clinical symptoms suggestive of acid peptic disease from September 2018 to September 2019 in the tertiary care center. A total of 150 patients were studied and advised to attend the Gastroscopy clinic.

1. The symptoms of acid peptic disorder were more in 31-40 years followed by 21-30 years.
2. In our study, we have found there was male predominance with male to female ratio of 2.94:1.
3) In our study, we found that there was an association of symptoms of acid peptic disease with H. Pylori infection. Pain in the epigastric region (80%) and nausea (50%) were the most frequent symptoms associated with H. pylori infection followed by dyspepsia (30.66%).
4. In our study, we have found that there is a strong association between H. Pylori in duodenal ulcer (86.66%), gastric ulcer (75%), and gastritis (82.85%).
5. In our study, we have found that the rapid urease test for H. Pylori was positive in 66% of patients and culture was positive in 38.66%.
6. In our study, we have found that the treatment regime with PPI Triple therapy has given maximum
symptomatic relief (95.12%). The other treatment regimens and the symptomatic relief provided by them are as follows:

a. Quadruple therapy 73.33%

b. Bismuth triple therapy 60.52%

**Conclusion**

From the study we could draw the following conclusion:

1. In our study, we have found that the incidence of Helicobacter infection in acid peptic disorder is 66%.
2. In our study, we have found that there is an association of H. Pylori infection in an acid peptic disorder like duodenal ulcer (86.66%), gastric ulcer (75%), and gastritis (82.85%).
3. In our study, we have found that the efficacy of the Rapid urease test is 66% and that of culture is 38.66% in the diagnosis of H. pylori infection in acid peptic disorder.
4. PPI Triple therapy is most effective in symptomatic relief and healing of the duodenal and peptic ulcer.

**Ethical Clearance:** Taken from institutional ethics committee.

**Source of Funding:** Self.

**Conflict of Interest:** Nil.

**Reference**

Correlation of Helicobacter Pylori Infection with Acid Peptic Disorders.

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Abstract

Introduction: The acid peptic disorder is a disorder in which due to hyperacidity, there is the damage of inner lining (mucosa) of the stomach and duodenum causing various manifestations like inflammation, ulcer, etc. A major symptom of the acid peptic disorder is a pain in the abdomen typically non radiating, burning, and located at in epigastrium, Other include nausea, vomiting, dyspepsia, haemtemesis, and melena, etc. Upper gastrointestinal tract disorders are common in surgical practice. Helicobacter pylori is a common cause of acid peptic disorders. So This study was undertaken to evaluate the correlation of H. Pylori infection with acid peptic disorders. Method: This study was a prospective observational. The duration of this study was from September 2017 to September 2019. The numbers of patients were 150. After the establishment of a clinical diagnosis of an acid peptic disorder, the patient was posted for endoscopy. H. pylori status was determined by the rapid urease test. The data collected included the presenting complaints, clinical signs, endoscopic findings, results of rapid urease test, and histopathological examination. The presence of H pylori infection was correlated with symptoms, and endoscopy findings. Results: In the present study, 150 patients with upper gastrointestinal symptoms were studied. It was found that the maximum number of subjects belonged to the age group 31-40 yrs. It was found that of subjects male 112 and female 38. It was found that maximum number of subjects had pain in epigastric region 120 cases i.e. 80% followed by symptoms nausea 75 cases ie. 50%. about endoscopic findings 70 patients were having gastritis, 15 had a duodenal ulcer, 9 patients had Duodenitis, the gastric ulcer was found in 08 patients, gastric malignancy in 02 patients and 46 patients had endoscopic normal mucosa. The highest positivity of RUT was seen in patients of duodenal ulcers (86.66%), followed by gastritis (82.85%) and gastric ulcer (75%). Conclusions: Present study, we have found that there is an association of H. Pylori infection in an acid peptic disorder like duodenal ulcer, gastric ulcer, and gastritis.

Keywords: Gastritis, duodenal ulcer, rapid urease test, dyspepsia.

Introduction

The acid peptic disorder is a disorder in which due to hyperacidity, there is the damage of inner lining (mucosa) of the stomach and duodenum causing various manifestations like inflammation, ulcer, etc. A major symptom of the acid peptic disorder is a pain in the abdomen typically non radiating, burning, and located at in epigastrium, Other include nausea, vomiting, dyspepsia, haemtemesis, and melena, etc. Upper gastrointestinal diseases are one of the common entities in surgical practice. A disease of the stomach and duodenum range from a benign disease like gastritis, peptic ulcer diseases which are usually having a self-
limiting although a prolonged course with a potentially dangerous complication like perforation with its attendant’s peritonitis both chemical and bacterial, to malignant diseases like carcinoma of the stomach. The upper gastrointestinal disease forms a major part of the total number of patients attending the outpatient clinic for gastrointestinal disorders. The treatment of peptic ulcers has been based on Schwartz dictum “No acid, no ulcer”. The gastric acid has dominated the approach to the diagnosis and treatment of peptic ulcer disease. Marshall and Warran (1984) published a paper entitled unidentified curved bacilli in the stomach of patients with gastritis and peptic ulceration first time in history. These investigators identified a spiral-shaped flagellated organism associated with peptic ulcer originally referred to as campylobacter pyloride. The organism is now known as Helicobacter Pylori. H. Pylori is a gram-negative organism resides in the stomach of human and other animals, affecting half of the population of world. H. pylori is a common cause of peptic ulcer of stomach and duodenum leading to clinically present as recurrent abdominal pain. It is correlated with around 90% of duodenal ulcers and 80% of gastric ulcers, major cause of morbidity. Mortality associated however is low but can result in chronic illness leading to significant manpower loss. It can also cause lymphoma and gastric carcinoma. Present understanding about the aetiology of peptic ulcer disease, gastric cancer, and dyspepsia is under evolution. The invention of Helicobacter pylori as an infective agent change our method to treat and diagnose it. Human beings are the only reservoir for Helicobacter Pylori. Direct transmission from person to person occurs via saliva and feces and infection also through contact with contaminated water. The Nobel prize in physiology or medicine for the year 2005 was awarded to both J. Robin warren and Barry J Marshall. These Nobel winners made a astonishing and unbelievable invention that chronic inflammation in stomach and duodenum (Gastritis, gastric and duodenal ulcer), is due to an infection by bacterium H. Pylori. Many tried to disprove it. As recent trend of decrease evidence of peptic ulcers was observed from last 40 years. The discovery of Helicobacter Pylori had a further major impact on the incidence of ulcer. This study was undertaken to evaluate the correlation of H. Pylori infection with acid peptic disorders.

**Method**

The present study was undertaken in the department of surgery, Jawaharlal Nehru Medical College, Wardha in collaboration with Datta Meghe Medical College Hingana, Nagpur, Datta Meghe Institute of medical science (DMIMS), Sawangi, Meghe, Wardha, Maharashtra India. This study was a prospective observational. The duration of this study was from September 2017 to September 2019. The numbers of patients were 150. The sample size was calculated as per formula was around 134 Hence 150 sample size was sufficient (N=2(α+Z1-β) 2 σ2/Δ2). The present study was carried out on the patients attending surgical OPD as well as the surgical ward from September 2017 to September 2019 in the tertiary center. We selected 150 patients having gastrointestinal complaints. The complaints were a pain in the abdomen, usually in the epigastric region, dyspepsia, nausea, vomiting, haematemesis, melena, etc. In personal history, the habit of tobacco chewing, cigarette smoking, alcohol consumption, and appetite were included. Detail history of patients was taken with regards to the symptom, their duration, and severity, other complaints, drug history. A thorough clinical examination and routine haematological examination of patients was done. After the establishment of a clinical diagnosis of an acid peptic disorder, the patient was posted for endoscopy. H. pylori status was determined by the rapid urease test and histopathological examination.

**Inclusion Criteria:** Patients between 15-60 years were having symptoms of the acid peptic disorder.

**Exclusion Criteria:** Patients taking antibiotics and bismuth compounds or omeprazole 4 wks before endoscopy. Pregnancy.

Detail of procedure followed. Patients with clinical symptoms of APD were advised to attend the Gastroscopy clinic. The patients were kept nil orally at night and were advised to attend endoscopy clinic early in the morning. Endoscopy was performed with Fujinon Gastroduodenoscope after obtaining informed consent. Esophagogastroduodenoscopy of each patient was done under surface local anesthesia with 4% Xylocaine viscous. Findings were noted and biopsies from the antrum and suspicious lesions were taken. Out of biopsies, one was subjected for a rapid urease test and the second biopsy specimen was used for histopathological examination. Endoscopic findings were recorded as gastritis, duodenal ulcer, gastric ulcer, gastric carcinoma, and endoscopically normal mucosa as per standard criteria.
Data Collection: The data collected included the presenting complaints, clinical signs, endoscopic findings, results of rapid urease test, and histopathological examination.

Statistical Analysis: The presence of H pylori infection was correlated with symptoms, and endoscopy findings. This calculation was derived using SPSS 17.0 statistical software.

Ethical approval for the study was obtained from the ethics committee of DMIMS University.

Results

In the present study, 150 patients with upper gastrointestinal symptoms were studied. It was found that the maximum number of subjects belonged to the age group 31-40 yrs. i.e. 26.66% followed by age group 21-30 yrs. i.e. 22.66%. It was found that of subjects male 112 and female 38. M: F 2.94:1.

Table 01: Symptoms profile of patients

<table>
<thead>
<tr>
<th>Symptom</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain in epigastric region</td>
<td>120</td>
<td>80</td>
</tr>
<tr>
<td>Nausea</td>
<td>75</td>
<td>50</td>
</tr>
<tr>
<td>Vomiting</td>
<td>42</td>
<td>28</td>
</tr>
<tr>
<td>Dyspepsia</td>
<td>46</td>
<td>30.66</td>
</tr>
<tr>
<td>Haemtemesis</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Meleana</td>
<td>09</td>
<td>06</td>
</tr>
</tbody>
</table>

Table 2: Endoscopic findings in patients with acid peptic disorder

<table>
<thead>
<tr>
<th>Endoscopic findings</th>
<th>No. of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastritis</td>
<td>70</td>
</tr>
<tr>
<td>Duodenitis</td>
<td>09</td>
</tr>
<tr>
<td>Duodenal ulcer</td>
<td>15</td>
</tr>
<tr>
<td>Gastric ulcer</td>
<td>08</td>
</tr>
<tr>
<td>Gastric malignancy</td>
<td>02</td>
</tr>
<tr>
<td>Endosc. Normal mucosa but clinically symptoms of APD</td>
<td>46</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
</tr>
</tbody>
</table>

70 patients were having gastritis, 15 had a duodenal ulcer, 9 patients had Duodenitis, the gastric ulcer was found in 08 patients, gastric malignancy in 02 patients and 46 patients had endoscopic normal mucosa.

Table 3. Result of Rapid Urease Test in Acid Peptic Disease

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Diagnosis</th>
<th>No. of pts.</th>
<th>RUT positive</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Gastritis</td>
<td>70</td>
<td>58</td>
<td>82.85</td>
</tr>
<tr>
<td>2.</td>
<td>Duodenitis</td>
<td>09</td>
<td>05</td>
<td>55.55</td>
</tr>
<tr>
<td>3.</td>
<td>DU</td>
<td>15</td>
<td>13</td>
<td>86.66</td>
</tr>
<tr>
<td>4.</td>
<td>GU</td>
<td>08</td>
<td>06</td>
<td>75</td>
</tr>
<tr>
<td>5.</td>
<td>GM</td>
<td>02</td>
<td>01</td>
<td>50</td>
</tr>
<tr>
<td>6.</td>
<td>Endo. Normal but clinically s/o APD</td>
<td>46</td>
<td>16</td>
<td>34.78</td>
</tr>
</tbody>
</table>

The highest positivity of RUT was seen in patients of duodenal ulcers (86.66%), followed by gastritis (82.85%) and gastric ulcer (75%).

Discussion

In this study, 150 patients (112 men and 38 women), within the range of 15 to 72 years, with symptoms suggestive of acid peptic disorder, were included. In
our study, we found that acid peptic disorder was more common in the age group 31-40 years (26.66% cases). Followed by 21-30 years (22.66% cases) and 41-50 years (17.33% cases).

In similar studies following results were seen:

Table 4: comparison with previous studies:

<table>
<thead>
<tr>
<th>Study</th>
<th>Year</th>
<th>Mean age of patients with APD</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Sharma</td>
<td>2006</td>
<td>32.8</td>
</tr>
<tr>
<td>C. Rekha</td>
<td>2007</td>
<td>40.89</td>
</tr>
<tr>
<td>GM Malik et al</td>
<td>1999</td>
<td>34.80</td>
</tr>
<tr>
<td>J. Yakoob et al</td>
<td>2005</td>
<td>40.89</td>
</tr>
<tr>
<td>Endale Tadesse et al</td>
<td>2014</td>
<td>36</td>
</tr>
<tr>
<td>Present study</td>
<td>2019</td>
<td>38.48</td>
</tr>
</tbody>
</table>

Sex wise distribution: In our study, we found that Acid peptic disorder was more common in males as compared to females. M: F ratio was 2.94: 1

Table 5: Endoscopic Finding

<table>
<thead>
<tr>
<th>Study</th>
<th>Gastritis</th>
<th>Duodenal ulcer</th>
<th>Gastric ulcer</th>
</tr>
</thead>
<tbody>
<tr>
<td>In our study</td>
<td>82.85%</td>
<td>86.66%</td>
<td>75%</td>
</tr>
<tr>
<td>Yakoob et al (2005)</td>
<td>65%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>J M Pajures (2005)</td>
<td>88%</td>
<td>90%</td>
<td>80-90%</td>
</tr>
<tr>
<td>Vandana Berry (2006)</td>
<td>-</td>
<td>90%</td>
<td>80%</td>
</tr>
<tr>
<td>Richard G (2005)</td>
<td>-</td>
<td>95%</td>
<td>80%</td>
</tr>
</tbody>
</table>

In our study, we found a maximum number of duodenal ulcer cases (86.66%) followed by gastric ulcer cases (75%) and gastritis (82.85%).

Symptom Analysis: In our study, we found epigastric pain, nausea, dyspepsia, and vomiting as the most common symptoms associated with the acid peptic disorder as detected on endoscopy (see table 3).

Vandana Berry in their study found that most common symptoms are epigastric pain, nausea, vomiting, and dyspepsia

Tom Richard Okello (2006) in their study found that the most common symptoms are a pain in the epigastric region, dyspepsia, haematemesis recurrent abdominal pain, vomiting, and miscellaneous. The findings in the present study are comparable to these studies

Table 6: Comparison with previous studies for diagnosis

<table>
<thead>
<tr>
<th>Name of the study</th>
<th>Year</th>
<th>RUT %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sivaprakash et al</td>
<td>1994</td>
<td>38.7</td>
</tr>
<tr>
<td>Maimomma et al</td>
<td>1994</td>
<td>65.8</td>
</tr>
<tr>
<td>B Sharma</td>
<td>2006</td>
<td>59</td>
</tr>
<tr>
<td>Present study</td>
<td>2019</td>
<td>66</td>
</tr>
</tbody>
</table>

In our study in patients with acid peptic disorder rapid urease test was positive in 99 patients (66%).

Conclusion

The present study was carried out on the patients attending surgical OPD as well as admitted patients inward who had clinical symptoms suggestive of acid peptic disease from September 20017 to September 2019 in the tertiary care center. A total of 150 patients were studied and advised to attend the Gastroscopy clinic.

1. The symptoms of acid peptic disorder were more in 31-40 years followed by 21-30 years.
2. In our study, we have found there was male predominance with male to female ratio of 2.94:1.
3. In our study, we found that there was an association of symptoms of acid peptic disease with H. Pylori infection. Pain in the epigastric region (80%) and nausea (50%) were the most frequent symptoms associated with H. pylori infection followed by dyspepsia (30.66%).
4. In our study, we have found that there is a strong association between H. Pylori in duodenal ulcer (86.66%), gastric ulcer (75%), and gastritis (82.85%).
5. In our study, we have found that the rapid urease test for H. Pylori was positive in 66% of patients.

From the study we could draw the following conclusion:

1. In our study, we have found that the incidence of Helicobacter infection in acid peptic disorder is 66%.
2. In our study, we have found that there is an association of H. Pylori infection in an acid peptic disorder like duodenal ulcer (86.66%), gastric ulcer (75%), and gastritis (82.85%).

Ethical Clearance: Taken from institutional ethics committee.
Source of Funding: Self.

Conflict of Interest: Nil.

Reference

Increased Paediatric Screen Time During Pandemic: A Cause of Concern to Child Health

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Abstract

COVID-19 has put the globe in an unforeseen and unexpected situation. COVID-19 has affected everyday life all over the world. Human population came face to face to this virus so gravely for the first time. During the initial days nearly all countries imposed lockdown to break the chain of viral spread. This created significant knock-on effects on the daily life of citizens. With the updates on COVID-19, the guidelines issued by medical authorities, categorized geriatric and paediatric age groups to be at high risk. In order to flatten the rising curve of exponential spread of the virus ban on gatherings resulted in enforced shut down of schools. Therefore children were bound to stay home. They were automatically exposed to the over use of electronic gadgets for recreation as well as education purpose. Hence, their screen time increased many fold. This paper describes the impact of COVID-19 and use of electronic screen on children.

Keywords: COVID-19, Lockdown, screen time, children.

Introduction

COVID-19 has taken a toll on every aspect of human life. Its rapid spread around the world, has posed enormous health, economic, environmental and social challenges to the global population. As a result, for the protection of their population mostly all the countries opted for lockdown. Nearly all nations are trying to slow down disease transmission by monitoring and treating patients, quarantining suspected individuals by touch surveillance, banning large gatherings, enforcing complete or partial lock-downs etc. The pandemic of corona virus is a serious disruption to the global economy. With the passage of time, to boost the sinking economy, gradually lockdowns are being lifted up. As, no records of any clinically approved antiviral drugs or vaccines that are effective against COVID-19 have been published so far. Therefore clinically vulnerable geriatric and paediatric age groups are forced to stay indoors, only. Due to schools shut all over still, over 1.2 billion children are out of the classroom globally.¹² As, the pandemic continues to exist globally, the education sector had to shift to the online method of teaching and learning.

During lockdown, children were already made to sit home. Due to lack of physical activity and social interaction, children engaged themselves with cell phones, computers, laptops, tablets and televisions. This added to many fold increase in the screen time of children. Parents also are struggling to maintain balance between work and childcare.³ This is also one of the factors contributing to acceptance of kids engaging with gadgets.

Though, earlier there was high growth in education
technology, it has been observed that there is a significant rise in usage of language apps, virtual tutoring, video conferencing tools, or online learning softwares, since COVID-19.[4]

The World Bank is working actively with education ministries in dozens of countries to support their efforts to use all kinds of educational technologies to provide distant learning opportunities to students while schools are closed, as a result of the COVID-19 pandemic.[5]

The Diksha, E-pathshala, Swayam, The National Repository of Open Educational Resources, are various free digital e-Learning platforms shared by the Ministry of HRD, India.

The decision of online schooling, is however, contributing to the increased screen time. During pandemic, the start of online education, urged parents to buy smart phones for schooling of kids. Not just schooling, many other online hobby classes also emerged on the web platform. Kids are being engaged in these activities, too. Thus, children are definitely spending much time on screen.

**Aims:** To assess the impact of pandemic on children education and health

**Objectives:**
1. To understand the effect of Covid-19 on education sector
2. To know the effect of online and offline screen activities on child health
3. To explore the possible solution to the problem

**Materials and Method**

Various Research articles, news bulletins, international reports, websites online available books, book chapters were reviewed thoroughly to understand and produce the contents.

**Discussion**

Many a number of researchers have done a comprehensive study on the evil effects of smart phones or cell phones on human health. Smartphones, Cordless phones emit radio frequency radiation (RF). During the use of cell phones, brain is the easy target for radiations. Considering this fact, IARC (International Society for research on Cancer) evaluated the knowledge in case-control human studies by the Hardell group from Sweden and the IARC Inter-phone study. These studies provided supportive evidence of increased risk for brain tumors, like glioma and acoustic neuroma. (IARC Monograph, 2013). The scientific panel concluded that RF radiation in the frequency range 30 kHz–300 GHz is a Group 2B possible human carcinogen.[6]

There are various possible health risks associated with overuse of mobile phones to mental and physical well-being, especially low IQ & inadequate behavioral growth in children, sleep deprivation, brain tumors and psychiatric disorders are major problems.[7]

During growing age, healthy spine is a prerequisite. When kids are slouching over a cell phone for many hours every day, their neck and back muscles are affected. So, they experience nagging pain in these parts. Pain, strain and aching neck muscles can cause a severe headache. Berolo, Wells, & Amick III in 2011 and Ning, Huang, Hu, & Nimbarte, in 2015, mentioned that hand held devices like smart phones and tablets have been associated with musculoskeletal pain and discomfort, particularly in children.[8][9]

Riadh et al., 2011 stated that as kids develop more quickly, their cell division is faster. Also their heads are more slender, hence they have bigger effect on their brain. Now, the prevalence of mobile phones use is increasing in children and possibility of children to be more sensitive than adults to potential adverse effects from exposure to RF-EMF, continuous monitoring of children’s health in relation to mobile phones and tablets is needed.

Children spend 7-8 hours of time on smart phones/computers alone, which is longer than they spend on any other activity. [10]

As children get used to personal space, it may further decrease children’s social interaction. Face-to-face social interaction during childhood, is a major factor affecting the development of children’s social competence [11] There is also the possibility of bidirectional associations between child social-emotional development and media use.[12]

Use of cell phones prior to sleep may affect the initial part of sleep by making changes in brain activity.[13]

Excessive screen time may lead to accelerated myopia excessive screen time.[14] Mobile phones are smaller devices that are generally held at a distance of
20–30 cm from the eyes, leading to digital eyestrain. It has been reported by Long et al that if the viewing distances are closer, the resulting eyestrain symptoms are greater after reading for 60 min from a smartphone.\[14\]

Mostly digital screens are backlit and emit blue light or high-energy visible (HEV) light wavelengths. It has been found that eyes are sensitive to blue light exposure. Gradually, after a passage of time the overall damage may increase the chances and severity of eye disorders. (e.g. age-related macular degeneration and cataracts)\[13\]

Pediatric age group is growing up with touchscreen technology at their fingertips. The speculations that the rising prevalence of asthenopia in the young may be due to over use of smart phones seems to be reasonable.\[11\]

An eye examination, reducing the amount of time that a child can continuously use the computer, the position of the computer, the lighting for glare on the computer screen, reduction of the amount of lighting in the room are the requirements for appropriate viewing habits in children.\[14\]

Similarly, the use of smart phones or tablets should also be under proper guidance by following sop of their usage.

Kesari et al. reported that mobile phone radiation may increase the reactive oxygen species, which plays an important role in the development of metabolic and neurodegenerative diseases. In an animal study, chronic exposure to Wi-Fi radiation appeared to cause behavioural alterations, liver enzyme impairment, pyknotic nucleus, and apoptosis in brain cortex.

With the advent of digital technology, entire population is exposed to some or the other effects of technology. Earlier generations have never been exposed during childhood and adolescence to this kind of radiation. Hence, it is going to take a long time to evaluate and conclude about the effects of radiation on younger population. Neuro-degenerative and carcinogenic changes take decades to manifest. But when earlier studies have already proved, use of smart phones as one of the possible causes of rise in cancer, education policy makers must keep in mind these established facts while designing education policy for younger population of the country.

In India, Swayam Prabha, a group of 32 Direct To Home (DTH) channels is devoted to telecasting of educational programs round the clock. The programmes are available across the country. The channels air courses for school education (class 9-12), higher education (undergraduate, postgraduate) as well as for out-of-school children, vocational education and teacher training.

A start up Think Zone” in Odisha, India has taken an initiative to reach out to children with no access to internet facility. It is broadcasting activity based learning modules with the help of a local radio channel for students aged 3 to 10.

Similarly, there is a need to explore other options of teaching and learning which are less harmful to paediatric age group. Many intellectuals assert that education system was already losing its relevance but the varying effectiveness of online learning cannot compete with the absence of classrooms.

**Conclusion**

To think of any long-term effects of the current online education scenario, will be a hasty step. But definitely a serious thought must be given to the future consequences of screen use by pediatric age group. Perhaps it is too necessary to educate children, but it still isn’t that big problem at all. So, it is the need of the hour to think about affordability of imparting education at the cost of health. Thus, the other ways out for educating children must be explored. More the hours of use, more will be the absorption of raditions, so children must be taught to refrain from mobile phones. Landlines, Skype, and computer phone services, when connected to the internet with a cable, don’t give off radiations, therefore the parents should take care that kids use those. The Wi-Fi routers in the home should be placed away from where people, particularly children, spend most of their time. To keep children healthy, overuse of cell phones and other wireless devices by kids must be restricted. We must not undermine children’s mental and physical state day-by-day, caused by the excessive usage of cell phones for education as well as recreation.

**Ethical Clearance:** Taken from institutional ethics committee.

**Source of Funding:** Self.

**Conflict of Interest:** Nil.
References


Indirect Impact of Covid-19 Lockdown on Society and Environment

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Abstract

In a fairly short time, the worldwide spread of COVID-19 has brought a dramatic reduction in industrial
activities, road traffic and tourism. During this time of crisis restrained human interaction with nature
has appeared as a blessing for nature and the environment. Reports from around the world indicate that
environmental conditions, including air quality and water quality in rivers, are improving after the COVID-19
outbreak, and wildlife is blooming. India has always been a pollution hub with enormous populations. But
since COVID-19 announced the lockdown, air quality has begun to improve and all other environmental
parameters such as water quality in rivers have begun to offer a positive sign of restoration.

Keywords: COVID-19, Lockdown, Impact, society, Environment, Trade, Unemployment.

Introduction

As of 21 August 2020, Covid-19, who emerged in
Wuhan somewhere back eight months in December 19,
has now taken shelter in host bodies in 213 countries
across the globe infecting 22,589,017 people and 792,475
deaths. India has also reported more than 2,905,823
positive cases with 54,849 death tolls on the same day1.
The disease remains uncontrolled, and the virus has no
proven cure. Locking in homes and social distances is
the only preventive step the country as a whole is taking.
But as the human activities in most areas are limited,
the country’s natural environment has begun to heal
itself. Factories, trade, aircraft and aviation are all at a
standstill. Social media has immerged out as platform
for people to stay connected with each other. Lockdown
due to COVID-19 has also affected employment status
of whole world. Worldwide import and export has been
reduced substantially.

Aims and Objectives:
1. Discussion about the various effects of lockdown
due to COVID-19 on environment, mental health,
trade, unemployment etc.
2. Try to find solutions on adverse effects.
3. Try to find out solutions to maintain positive effects
of lockdown.

Materials and Method

Material and data for this article is collected from
authentic official websites and news channel reports
from national and international platform.

Result

Due to lockdown, environment and society is
influenced as follows:

Air Quality: Thanks to the effect on travel and
industry of the coronavirus outbreak many regions
and the world as a whole witnessed a decrease in air
pollution.2 The Energy and Clean Air Research Centre
estimated that strategies for suppressing coronavirus
spread, such as quarantines and travel bans, resulted in a 25% reduction in carbon emissions. NASA uses an instrument for ozone monitoring (OMI) to measure and monitor the ozone layer and contaminants such as NO2, aerosols and others. According to scientists at NASA, the decline in NO2 emissions originated in Wuhan, China and spread gradually to the rest of the planet.

**Water Quality:** Water in the canals in Venice cleared and saw greater flow of water. The increase in water clarity was attributed to the settling of sediment which is disturbed by boat traffic and the decrease in air pollution along the waterways listed.

**Wildlife:** Some animals have been seen in towns as people remain at home due to lockdown and travel restrictions. Sea turtles were seen laying eggs on the beaches they once avoided (such as the Bay of Bengal coast), due to lower human intrusion and light pollution rates.

German scientist Rainer Froese has said that fish biomass will increase due to the sharp decline in fishing, and has projected that some fish such as herring could double their biomass in European waters.

**Carbon emission:** A study published in May 2020 found that the daily global carbon emissions declined by 17 percent during the lockdown steps in early April and could lead to an annual decrease in carbon emissions of up to 7 percent, which according to researchers would be the largest drop since World War II. They attribute these declines largely to reducing the usage of transport and manufacturing activities.

**Public mobility:** Public mobility has deteriorated dramatically due to constraints, including the imposition of a lockout in several countries, a Google Study reveals. Across India, shopping and leisure places saw the steepest decline across people’s presence between February 16 and March 29 relative to traffic between January 3 and February 6. There was a significant rise in phone traffic from homes, meaning more people were staying at home. Visits to restaurants, shopping malls and movie theatres plummeted by 77 per cent between Feb. 16 and Mar. 29 compared to the period from Jan. 3 to Feb. 6. Visits to stores, markets and pharmacies have dropped by 65%. Visits to national parks, beaches and public gardens have been reduced by 57%. Compared to the period between Jan. 3 and Feb. 6, the use of public transport facilities such as buses and trains fell 71 per cent between Feb. 16 and Mar. 29. Workplace visits declined 47 per cent as many people were told to work from home. People stayed 22 per cent more at home than they did between January 3 and February 6.

**Impact on trade:** Trade in United States has been declined which shows impact on the trade in other countries of world.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Trade</th>
<th>Export</th>
<th>Import</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Passenger cars and light trucks</td>
<td>Decreased by 9.8 percent</td>
<td>Decreased by 6.2 percent</td>
</tr>
<tr>
<td>2</td>
<td>Engine and parts</td>
<td>Decreased 28.9 percent</td>
<td>Decreased by 23.0 percent.</td>
</tr>
<tr>
<td>3</td>
<td>Crude oil</td>
<td>Decreased 7.9 percent</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Refined petroleum products</td>
<td>Decreased 9.8 percent</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Medical equipment</td>
<td>Increased 24.2 percent</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Medical diagnostic equipment</td>
<td>Increased 34.8 percent</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Medical diagnostic products</td>
<td>-</td>
<td>Increased 44.4 percent</td>
</tr>
<tr>
<td>8</td>
<td>Disinfectants and sterilization products</td>
<td>Increased by 14.4 percent</td>
<td>-</td>
</tr>
</tbody>
</table>

**Impact on Unemployment:** The International Labour Organization (ILO) projected that the spread of corona virus would threaten more than 25 million jobs globally. Four out of five people (81 per cent) in the 3.3 billion global work forces are currently impacted by the complete or partial closure of the workplace. The United States, the United Kingdom, Canada and most European and Asian countries have already registered huge jobs losses leading to significant increase in unemployment. The ILO in its report ‘‘*‘ describes COVID-19 as ‘worst global crisis since World War II’*.

Low-paid and low-skilled informal workers are particularly concerned in low- and middle-income countries, where the industries and services have a high proportion of these informal employees, who account for...
61 per cent of the global workforce or 2 billion men, and lack any social security. The sudden loss of livelihood will make them horrifying.

The CMIE (Centre for Monitoring Indian Economy) report showed a major job loss and corresponding substantial unemployment rate rise in March 2020. The unemployment rate in March 2020 stands at 8.7 per cent, which is far higher than the government’s estimate of unemployment in 2017-18 at a 45-year high of 6.1 per cent. This is the highest jobless rate since September 2016. Over the same time, the unemployed have also risen from 32 million to 38 million. The situation got worse when we went into the lockdown time last May week and the unemployment rate rose to 23.48%.

Role of Social media during lockdown: During the lockout the social media plays a significant role. During the lock down social media always update people’s current affairs. The role of social media is very important in managing the anger, tension, and fear of the people and in helping they update the current scenario. Also Study indicates that active use of social media is better for you than passive use, so consider writing a blog or sharing status updates as a way to connect. And it will help you organize virtual encounters with family and friends. These should not limit themselves to chatting; they will engage in community activities such as watching films, playing drama and online conversation through video calls and share their views on academic aspects and other aspects of cooking together. Teachers are conducting online lectures for their students so they do not skip their academics by use of social media applications during the lockdown.

Only a couple of days of isolation may cause anxiety and depression to develop. Add to it the imminent possibility of constantly hammering a terrible disease through the media, and you have a prescription for several shades of mental and physical distress.

Impact on Mental health and behavior: Human beings have evolved into social beings, and are designed to live in collaborative communities. Feeling removed from families, friends and employers can be unbalanced and stressful for most people and can lead to psychological and physical health issues in the short or even long term. Psychological consequences of isolation may include a rise in levels of anxiety, aggression, depression, forgetfulness and hallucinations. In those with inherent pre-existing susceptibilities psychiatric disorders that are precipitated and even manifest without precondition in several others. Personal relationships help us cope with tension, and if we lack this outlet for steam, a massive emotional voice will result which, for an average person, is difficult to deal with.

Solitary inmates and patients in segregated medical facilities have also had negative psychological effects including elevated anxiety, panic attacks and elevated paranoia rates. This has been found that social isolation has a correlation with greater alcoholism. Researchers who had to live in remote areas such as deserts, the Antarctica, forests and outer space have confirmed that overcoming loneliness is a tough challenge. Yossi Ghinsberg, an Israeli explorer who spent several weeks alone in the Amazon, admitted making imaginary companions to fend off the loneliness. The shutdown of Covid has put forced isolation on many.

Young people live away from their families, trapped in small apartments with abysmal cooking skills. Many senior citizens living on their own seek companionship by meeting up in community parks with age mates. We find themselves marooned, robbed of social contact and even from their children’s sporadic visits. Lack of playtime with peers causes children to become irritable and edgy.

Staying in a confined space with family is not a pink picture for everyone. It may be extremely oppressive and claustrophobic for large low-income families huddled together in small single-room houses. Children are not lucky enough to have a lot of board/electronic games or books to keep them busy. Add to this the profound uncertainty of running out of food funds and basic necessities. On the other hand, there are people with dysfunctional family dynamics, such as dominant, abusive or alcoholic partners, siblings or parents, who make a period of trial stay at home. There has been a worldwide increase in the incidence of suicide and physical abuse against women. Higher anxiety and depression often impair an individual’s immune system and make them more vulnerable to disease.

Discussion

The issue today is not whether the Covid-19 passage will bring similar socio-political changes; experts predict it will be a long and damaging fight. This needs to be preparing for the long term. We need to control our population’s physical and psychological harm by urgently diverting full resources to improve our health-care system. We have to maintain a fair distribution of
food and essential needs among the less favoured groups. Before the lockout we tripped badly by misunderstanding their worries. Even more bungling will lead to messy rioting scenarios and food theft. The Government needs to move into action quickly to prevent losing legitimacy. A higher death toll also means that many families deprive members of their earnings and put greater burden on the welfare system. Throughout India, losses are the highest in the males of the 22-40 year age group, which is also the most active.

Import and export trade has decreased all over the world due to lack of transport; but environment is seen to be recovering up to great extent.

Today, social media like Twitter, Face book and Instagram have become the main information sources. They are also platforms for misinformation and false news.

Conclusion

Stigma and blame targeted at outbreak-affected communities may hinder international trade, finance, and relationships, prompting further unrest. Care needs to be taken to erase the stigma associated with disease, racism, religious propaganda and psychosocial impact and to be implemented through regular discussions with trained and specialist healthcare staff by setting up task forces and execution teams that are directly involved in healthcare delivery systems without creating any communication gaps between policy makers and ground level.

It is desperately necessary to set up mental health organizations specific to future pandemics with branches in many nations and individual healthcare institutions for research, delivery of mental healthcare and organization of awareness programs at both personal and community levels. To relieve psychological anxiety in the general population over this continuing pandemic, standardized websites and toll-free helpline numbers can be introduced. Social media should be used in good sense to educate people about dynamics of transmission, disease symptoms, and time when precise medical consultations are required. Strict government laws and legislation regarding fake news, social media rumours, disinformation and misinformation should be implemented to protect social media from devaluations.

The COVID-19 pandemic has clearly shown us how, even in the 21st century, a “virus” can adversely impact our lives and at the same time make us aware that the greatest assets of humanity are health, goodwill, compassion, unity, creativity and awareness.

Ethical Clearance: Taken from institutional ethics committee.

Source of Funding: Self.

Conflict of Interest: Nil.

References

Participation in Community-Based Road Safety Program Associated with Motorcycle Helmet Use in Udon Thani Province, Thailand

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Abstract

Background: Road traffic fatalities remain a significant cause of premature death in Thailand, with motorcycle riders comprising the largest proportion of deaths. Helmet use improves road safety outcomes; therefore, it is important to understand how to improve helmet use. The purpose of this study was to determine whether community participation in road safety meetings was associated with helmet use and to identify other factors associated with self-reported helmet use.

Objective: To determine the participation in community-based road safety program associated with motorcycle helmet use in Udon Thani Province, Thailand

Method: Multivariable logistic regression was used to analyze the association between self-reported participation in community meetings about road safety and other factors with self-reported helmet use behaviors among 2,474 motorcycle riders (55.4% female, aged 53.4 ± 12.3 years) in Prachaksinlapakhom District, Udon Thani province, Thailand.

Results: Regular participation in community road safety meetings (ORadj.=1.61; 95% CI=1.24 to 2.08, p-value <0.001) was associated with increased self-reported helmet usage. Risk factors for non-compliance included being female (ORadj.=0.64; 95%CI=0.53 to 0.77, p-value <0.001), elderly (i.e., ≥60 years old) (ORadj.=0.65; 95%CI=0.54 to 0.79, p-value <0.001), and smoking (ORadj.=0.79; 95%CI=0.62 to 0.97, p-value = 0.029).

Conclusions: Regular community participation was associated with increased self-reported helmet usage after adjusting for other factors. Further research should assess whether helmet use outcomes improved following participation in community road safety activities.

Keywords: Community participation, motorcycle helmet use, road safety program.

Introduction

Globally, over 1.3 million people die from road traffic injuries, or 18.2 per 100,000 population, per year. Rates vary substantially across regions. South-East Asia has one of the highest road traffic death rates, at 20.7 deaths per 100,000 population, with 43% occurring among users of two- and three-wheeled motorized
vehicles—the highest such proportion among World health Organization regions.1

Traffic injuries are a major public health problem in Thailand.2 Thailand is frequently ranked as having one of the top five highest per capita death rates from road traffic accidents, with a mortality rate of 32.7 per 100,000.1 Accidents have increased 1.65 percent every year, while related deaths have increased by 4.01 percent every year.3 Nearly three out of every four road traffic deaths occur among riders of motorized two- and three-wheeled vehicles in Thailand.1

Helmets are one of the most effective methods to reduce the severity of injuries in motorcycle accidents and reduce the loss of life.4 Nationwide helmet use in Thailand, however, is estimated around 44%. Moreover, pillion riders were 2.5 times less likely to wear a helmet than drivers (19.3%).5 Higher compliance with helmet laws would substantially improve Thailand’s outcomes in road safety. It is estimated that increasing the nationwide helmet compliance to 90% would reduce total road traffic deaths by 23%.6

Several factors influence helmet usage among motorcyclists. For example, accident experience can predict helmets use.7 Additionally, personal factors such as gender and family income correlate with helmets use.8 Helmet laws and law enforcement also have been shown to affect vehicle driving behavior9 and decrease the morbidity of head injuries.10 To improve helmet usage, several programs, including community participation projects, have been proposed. In one such program an increase of 13.2% in the rates of helmet usage was found.4 This study aimed to measure the relationship between participation in community-based road safety programs and helmet, as well as identify other factors associated with helmet use.

Materials and Method

Study Population: Prachaksinlapakom District is located in Udon Thani province, Thailand. The district has a population of 25,621.11 The area is suburban with an agriculture (71.49%) as the most common occupation. Udon Thani is one of the largest provinces in the northeastern region. Annually, between 6,596 and 6,980 people were injured in the province between 2017 and 2019.12

Data Collection: Data was collected by the District Health Coordinating Committee between 2017-2018 using a “Health Information Status” questionnaire. Questionnaires were collected by village health volunteers. The instrument requested participants to report helmet use behaviors, participation in community activities, demographics, smoking status, alcohol consumption, and chronic disease. The primary outcome was helmet use. The main factor of interest was community participation.

A total of 3134 records, representing most of the families in the district, existed within the governmental database. To be eligible, records were included in the study if the respondent was aged between 15 and 80 years and reported using a motorcycle in daily life (n=3035). After removing records without the primary outcome (helmet use) and primary factor (community participation), the final sample size was 2474.

Statistical Analysis: Prior to univariate analysis, any continuous variable (i.e., age) was recoded into categorical format. Univariate logistic regression was then used to analyze the association between each factor and helmet use and identify factors to be included in the initial model. Factors were included in the initial model if significant in the univariate analysis (p<0.25) and confounding factors.

Multivariable logistic regression analysis was utilized to fit models and assess the relationship between helmet use and community participation, while adjusting for potential confounding factors. Backwards stepwise elimination method was used to remove factors (p > 0.05). Model fit was assessed using AIC. Statistical analysis was performed with STATA software version 15.0.

Results

Sample Characteristics: A total of 2,474 participants were included (Table 1). Most of the subjects (55.4%) were female, and the average age was 53.4 ± 12.3 years old. Agriculture was a major occupation of participants (71.5%), and most of the education level was a primary school (68.7%). Almost all participants were married (73.0%). Most participants did not smoke, drink alcohol, or have chronic disease (74.2%, 64.5%, and 78.2%, respectively). Most participants reported participating in community activities of subjects was seldomly (46.1%) or usually (40.3%) (Table 1).
Table 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number (n = 2,474)</th>
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<td><strong>Age (Years)</strong></td>
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<td>45-65</td>
<td>1,463</td>
<td>59.14</td>
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<tr>
<td>&gt;=65</td>
<td>440</td>
<td>17.78</td>
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<td><strong>Mean (SD)</strong></td>
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<tr>
<td><strong>Median (Min:Max)</strong></td>
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**Univariate Analysis:** Crude analysis identified three factors for inclusion in the initial model (Table 2). They were community participation (usually: OR = 1.60; 95% CI = 1.24 to 2.06, p-value < 0.001), gender (female: OR = 0.72; 95% CI = 0.61-0.85, p-value < 0.001), and age (≥60 years old: OR = 0.68; 95% CI = 0.57 to 0.81, p-value < 0.001).

**Multivariable Analysis:** The final multiple logistic regression retained all confounding factors and showed that three factors strongly associated with outcome were community participation (usually: OR adj. = 1.61; 95% CI = 1.24 to 2.08, p-value < 0.001), gender (female: OR adj. = 0.64; 95% CI = 0.53 to 0.77, p-value < 0.001), and age (≥60 years old: OR adj. = 0.65; 95% CI = 0.54 to 0.79, p-value < 0.001). In addition, smoking status who have smoking were associated with helmet using behavior (OR adj. = 0.79; 95% CI = 0.62 to 0.97, p-value = 0.029).

**Discussion and Conclusion**

**Discussion:** Our main finding indicates that community participation is associated with self-reported helmet use. Participation in community activities provides an opportunity to receive information and share ideas among many stakeholders. Previous studies have found that the community participation projects can increase the rates of helmet usage. Increased knowledge and awareness are likely explanations for this relationship. Studies have found that knowledge and greater awareness of safe driving was related with safe driving, and motorcyclists with low exposure to road safety awareness campaigns were more likely not to use helmets when compared to higher exposure groups. Moreover, widespread awareness programs have been shown to increase motorcyclist’s helmet use and improve road safety of motorized users.

Females, elderly, and smokers were also associated with lower self-reported helmet use. Gender is a personal factor that is different from lifestyle and behavior factors. Females have certain physical characteristics that may hinder the use of helmets. Previous studies have shown lower helmet usage among adult female motorcyclists in Thailand. However, the relationship between helmet use and gender may differ depending on the population. Male adolescent motorcycle drivers and male bicycle riders were shown to have lower self-reported helmet compliance than females. Among university students in Thailand, men engaged in motorcycle accident risk behavior more often than women. When the younger and older demographics were mixed, the relationship was not significant, suggesting age and gender may be compounding.

Another factor, age, is one of the factors involved in wearing a helmet, because it is representative of experience and daily living. This study found that the
elderly were less likely to report wearing a helmet. The injury and prevention program should focus on the older aged group because their injuries are more severe than younger adults. Along with being female and not wearing a helmet, increasing age was associated with an increased risk of death among two-wheeled vehicle traffic accidents in Spain. However, this study’s sample primarily consisted of adults and did not include many young or adolescent people. Therefore, the elderly were less likely to report helmet use as compared to primarily middle-aged adults. If younger adults are studied, previous studies show low helmet use among teenagers and young adults. On the other hand, older adults and elderly were shown to have lower rates of motorcycle injuries in a Thai cohort study. Therefore, while helmet compliance may be lower, usage may differ to include only short-distance or low-risk driving situations relative to younger groups that are more dependent on motorcycles as the primary mode of transportation.

Smoking was also shown to be associated with lower helmet use. Smoking may hinder helmet use, because smoking makes it difficult to use a helmet. Smoking may also indicate high risk-taking behaviour or lower safety compliance, such as seatbelt use.

**Conclusions**

This study found that regular community participation was associated with increased self-reported helmet usage after adjusting for other factors. Being female, older than 60, and smoking were also shown to be associated with lower reported helmet use. Further research should assess whether helmet use outcomes improved following participation in community road safety activities. Efforts should be made to expand community participation in road safety campaigns.

**Ethical Considerations:** This study was approved by the Khon Kaen University Ethics Committee for Human Research based on the Declaration of Helsinki and the ICH Good Clinical Practice Guidelines (reference number HE 622120).

**Acknowledgement:** We are grateful to Prachaksinlapakhom District Health Coordinating Committee Prachaksinlapakhom District, Udon Thani province, Thailand and Prachaksinlapakhom Hospital, Udon Thani province, Thailand for health status information. Finally, thanks are due to Anthony C. Kuster for his advice and assistance in writing this paper.

**Conflict of Interest:** No conflicts of interest to declare.

**Source of Funding:** Self-funding

**References**

11. Official statistic registration systems, Department of Provincial Administration. Information about


Dermatological Manifestations in Patients of Chronic Kidney Disease (CKD)

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Abstract

Background: CKD is associated with various mucocutaneous manifestations that impair the quality of life. The objective was to study the incidence of various cutaneous manifestations in CKD patients.

Materials and Method: 130 (M:F = 4.2:1) patients aged 15–78 (Mean age- 50.32 years) having CKD for 3 month to 5 years were studied for mucocutaneous manifestations. Forty (30.7%) patients were on hemodialysis for 1-3 months. Detailed medical history, clinical and mucocutaneous examination and lab investigations were performed. KOH mounts, skin biopsy, Gram’s and Giemsa staining, bacterial or fungal cultures were performed as required.

Results: Xerosis in 104 patients (80%), skin pallor in 76(58.4%), pruritus in 52 (50.9%) patients, pigmentation in 45(34.6%) and purpura in 12 (9.2%) patients were the major dermatoses. Perforating folliculitis occurred in 1 (0.76%) patient. Mucosal findings included coated tongue in 14(11.66%), xerostomia in 11(9.16%) and macroglossia with teeth markings and fissured tongue in 9 (7.5%) patients each, angular cheilits in 3 (2.5%), and aphthous stomatitis and black pigmented tongue in 1 (0.83%) patients each. Hair abnormalities included sparse scalp and body hairs in 43 (33%), 11 (8.4%), respectively and lusterless hair in 22 (16.9%) patients. Major nail abnormalities were half and half nails or Lindsay’s nails in 33(25.3%), longitudinal ridging in 29(22.3%), leuconyicha in 13(10%), onycholysis in 9(6.9%), Beau’s lines in 6(4.6%), koilonychia in 4(3.07%), Mee’s lines in 1(0.76%) and Meuhrrcke’s lines in 1(0.76%).

Conclusions: Xerosis, pruritus, skin pallor/pigmentary changes, half and half nails, longitudinal ridging, discoloration, sparse hairs, coated tongue, xerostomia, macroglossia, and infections were the most common mucocutaneous manifestations in the studied patients irrespective of hemodialysis status.

Keywords: Cutaneous manifestations, end-stage renal disease, skin diseases.

Introduction

Chronic kidney disease (CKD) is a term that encompasses all degrees of decreased renal function, from damaged–at risk through mild, moderate and severe chronic kidney failure. The guidelines define CKD as either kidney damage or a decreased glomerular filtration rate (GFR) of less than 60 mL/min/1.73 m\textsuperscript{2} for at least 3 months.\textsuperscript{(1)} It is a worldwide public health problem. Studies report the prevalence of Chronic kidney disease (CKD) to be 17.3% in India.\textsuperscript{(2)} CKD is more prevalent in the elderly population. However, while younger patients with CKD typically experience progressive loss of kidney function, 30% of patients over 65 years of age with CKD have stable disease.\textsuperscript{(3)} Most patients with severe CKD progress to end-stage renal disease (ESRD). Cutaneous manifestations are common in all stages of CKD
particularly towards ESRD with a prevalence of 50–100%.(4,5) An earlier study by Uday Kumar et al. reported all patients with ESRD on hemodialysis to have at least one skin manifestation.(6) The skin manifestations maybe due to the fact that at present dialysis is not as efficient as a normal kidney and cannot replace its endocrine function resulting in electrolyte imbalance and build-up of uremic substances. Some of the manifestations may be as a result of dialysis and immunosuppressive drugs used.(7) Skin manifestations specific to dialysis patients include acquired perforating dermatosis, calcific Uremic arteriolopathy (calciphylaxis), bullous lesions and nephrogenic fibrosing dermopathy. On the other hand, pruritus, xerosis, nail disorders, hair disorders, pigmentary changes, purpura, mucosal changes and pallor though not specific to hemodialysis, are more frequent in patients with CKD. However, it may be difficult to implicate either CKD or hemodialysis alone for any particular cutaneous manifestation as many of them are associated with both.(8) The aim of the study was to analyse the various cutaneous and mucosal manifestations in patients with CKD. We have limited studies on the pattern of mucocutaneous manifestations in CKD patients in India, so this study was carried out.

**Materials and Method**

A hospital based cross sectional study was conducted on 130 patients admitted in Rama Hospital for duration of 1 month after taking informed consent. The study was approved by ethical committee of the hospital. Patients with history of Human immunodeficiency (HIV), renal transplant recipients and patients with acute renal failure, hepatobiliary, pancreatic, or thyroid disorders, cutaneous, or systemic malignancies were excluded from the study. Details of medical history, clinical and mucocutaneous findings and investigations were recorded. KOH mounts, skin biopsy, Gram’s and Giemsa staining and bacterial or fungal cultures were performed when needed. The diagnosis and clinical staging of CKD was as per the National Kidney Foundation severity assessment criteria.

**Statistical Analysis:** Statistical analysis was done using Chi-square test to find associations between various cutaneous manifestations. Biochemical values were expressed as mean. To explore relationship of cutaneous findings and biochemical parameters, the unpaired t test was used. A p value of less than 0.05 was considered significant.

**Results and Discussion**

Of the 130 patients, 105 were males and 25 were females (M:F=4.2:1). The age of patients ranged from 15-78 years with the mean age being 50.32 years having CKD for 3 months to 5 years.

Out of 130, 40(30.7%) patients were on hemodialysis for 1-3 months. At least one cutaneous manifestation was present in 98% of the patients recruited in the study. Diabetes mellitus (DM) was the most common cause (45%) of renal dysfunction followed by hypertension (HTN) in 35% cases and glomerulonephritis in 4% cases.

Xerosis was the most common cutaneous finding as reported in 104 patients (80%) with severe and ichthyotic in 10 (8.33%) patients irrespective of the dialysis status. This is consistent with the previous studies also.(9,10,11,12) It can be correlated with decreased sweating and lowered levels of lipids in the skin surface. The decreased sweating may be due to a decrease in the size of the eccrine duct.(5,6) The second most common finding after xerosis was pruritus as seen in 82 (63%) patients. The pruritus intensity was mild to moderate in 52 (50.9%) patients with xerosis. It may be generalized or localized, episodic or continuous. It may or may not improve from hemodialysis and occurs in 15–49% during predialysis and in 19-90% hemodialysis patients.(5,6,10,13) However, there was no significant difference among patients with or without hemodialysis. The pathogenesis of uremic pruritus is poorly understood but its intensity is directly proportional to the severity of xerosis(14). In addition to pruritus, associated with xerosis is elastosis and premature skin wrinkling in 33-40% patients.(14,15,16) Only 4 (3.3%) patients showed early skin wrinkling in this study.

Skin hyperpigmentation is another common finding in patients especially with ESRD. In our study, 45(34.6%) CKD and 48% of the hemodialysis patients had hyperpigmentation which is consistent with previous studies also.(10,12) This may be attributed to the accumulation of Melanocyte Stimulating Hormone (MSH) due to failure of kidneys to excrete it. Extremities and photoexposed areas were more severely affected.

Pallor of the skin due to anemia was observed in 76(58.4%) patients and was significantly more common among patients on hemodialysis. The anemia may be due to anoxia and decreased erythropoiesis due to reduced erythropoietin secretion by the kidney.(17) Ecchymosis/purpura was seen in 12 (9.2%) patients...
but said to improve after hemodialysis.\(^6,12,16\) These are attributed to the increased vascular fragility and platelet dysfunction resulting from high blood urea levels or heparin use during dialysis. Perforating folliculitis of unclear pathophysiology is significantly common among diabetic CKD patients.\(^6\) which was observed in only 1(0.76%) in our study.

Mucosal abnormalities occurred in 55 (42.3%) patients including coated tongue in 14 (11.66%), xerostomia in 11 (9.16%), macroglossia with teeth markings and fissured tongue in 9 (7.5%) patients each, angular cheilitis in 3 (2.5%), and aphthous stomatitis and black pigmented tongue in 1 (0.83%) patients each.

The consistent nail change characteristic of CKD with or without dialysis is Lindsay’s “half-and-half nails,” a band of discoloration over the distal nail plate from increased density of nail bed capillaries, with a reported prevalence of 17–76%.\(^6,18\) In our study, half and half nails or Lindsay’s nails was seen in 33(25.3%) cases and longitudinal ridging in 29(22.3%) cases. Other findings were leuconychia in 13(10%), onycholysis in 9(6.9%), Beau’s lines in 6(4.6%), koilonychias in 4(3.07%), Mee’s lines in 1(0.76%) and Meuhrcke’s lines in 1(0.76%)

Hair abnormalities were seen in 65 (54.1%) patients. The findings were sparse scalp and body hair and lusterless hair in 43 (33%), 11 (8.4%), and 22 (16.9%) patients, respectively consistent with previous studies.\(^11,12,18\) The factors responsible for these changes are anemia, reduced sebum production and parathormone levels, stress of ESRD/dialysis or neglected hair.\(^6,15,16,18\)

There is increased susceptibility for bacterial, fungal, and viral cutaneous infections in 28–70% of CKD patients due to reduced immunity.\(^5,15,19\) In this study, fungal infections 22(16.9%) were more common than bacterial infections 15(11.5%) and viral infections 7(5.38%).

Gynaecomastia was seen in one patient of end stage renal disease in our study. Udaykumar et al reported gynecomastia in 1% of cases.\(^6\)

There was no significant association between biochemical parameters and various cutaneous findings (p>.05). There was no significant association between duration of dialysis and cutaneous manifestations (p>.05).

**Conclusion**

Xerosis, pruritus, skin pallor/pigmentary changes, nail pallor, nail discoloration, sparse hairs, coated tongue, xerostomia and macroglossia and infections were the most common mucocutaneous manifestations in majority of studied patients irrespective of their hemodialysis status.

**Ethical Clearance:** Taken from Institutional Ethical committee

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**


The Predictive Power of Moral Intelligence on Professional Commitment of Nurses

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Abstract

Background: Nurses’ adherence to ethical values in the field of patient care is affected by various factors, especially moral intelligence. The role of moral intelligence on professional commitment is an issue leading to improving the quality of services and health promotion. The aim of this study was to investigate the predictive power of moral intelligence on professional commitment of nurses.

Method and Materials: This descriptive-analytical study was carried out on 100 nurses and 300 patients selected by stratified random sampling. Data were collected using the Lenik & Kiel moral Intelligence Questionnaire and Nurse Professional Commitment Questionnaire. Data were analyzed using descriptive analysis and regression.

Results: The results showed that there was a significant statistical relationship between moral intelligence and professional commitment (P=0.001). There was a significant relationship between demographic variables, age and work experience with moral intelligence and two variables of gender and professional commitment (P <0.05). In addition, regression showed that dimensions of nurses’ moral intelligence account for 41% of the variance of nurses’ professional commitment. of the four dimensions of nurses’ moral intelligence, compassion had the most significant effect (P=0.03, β=0.32).

Conclusion: The results of this study showed that moral intelligence is associated with professional commitment and is able to predict it. Therefore, it is recommended that nursing managers and authorities to put the Strengthening nurses’ moral intelligence in the list of their priorities.

Keywords: Moral Intelligence, Professional Commitment, Nursing.

Introduction

Nowadays, health care environments are rapidly changing, and nurses meet various ethical issues in their daily practice¹. Among the factors that influence the performance of nurses in enforcing standards, providing professional and ideal care and making the right decisions, attention is paid to ethical values². Nurses’ adherence to ethical values in the field of patient care is influenced by various factors, especially moral intelligence³. Moral intelligence is one of the four dimensions of intelligence (intellectual, emotional, spiritual, and moral) that encompasses the mental capacity of individuals to apply human principles rather than personal goals and values⁴. In fact, moral intelligence provides a framework for proper human performance and is a behavior predictor⁵. Kiel considers moral intelligence to include the
principles of righteousness, responsibility, compassion, and forgiveness. People with high moral intelligence link their work to ethical principles, which in turn increases their commitment and responsibility and thereby improves individual and group performance.

Professional commitment is a practical and social dimension of ethics that has created a positive emotional tendency to respect the rights of others in the context of ethics; adherence to it promotes the nursing profession and increases the satisfaction of nurses and patients. Given the role of professional commitment in increasing the efforts of individuals to devote themselves to their profession, this issue has received special attention by managers of different professions around the world. Professional commitment is one of the main subjects of the nursing profession. So that professions commitment, belief in and acceptance of professional values and goals, strives for its realization and better service delivery.

A review of existing studies of professional commitment indicates the relationship between professional commitment and various performance indicators including job satisfaction, loyalty to the profession, individual stability, and staying in the profession and job performance. Studies show that commitment is one of the factors influencing the intention of nurses to leave work, in such a way that the higher the commitment of nurses, the lower their rate of leaving work. According to the findings of various researches, professional commitment not only leads to better care delivery by nurses, but also job satisfaction and striving for career advancement. While only 1.2% of nurses reported high job satisfaction in our country, most of them did not have much commitment and desire to leave the nursing profession. As the nursing profession has increased, the quality of nursing care has also declined.

Nurses with high moral intelligence appear to be more capable and willing to provide comprehensive care. Given the proven impact of professional commitment on various indicators, the present study investigated the predictive power of moral intelligence on professional commitment of nurses working in educational centers of Urmia. It should promote and, at the same time, improve the quality of nursing care.

**Method and Materials**

This descriptive-analytical study was carried out on 100 nurses working in educational centers of Urmia city (Imam Khomeini, Taleghani, Motahari, Seyyed al-Shohada hospitals) and 300 patients selected by stratified random sampling.

Inclusion criteria for nurses were having at least one year of clinical experience, having at least a bachelor’s degree, nurses working in all wards with the exception of intensive care units, emergency departments, clinics, children, infants, psychiatrists, operating rooms, angiography, burning, and willingness to participate in the study.

Inclusion criteria for patients were being hospitalized for at least three days, having no serious communication problems such as blindness and hearing loss, having no serious physical or psychological problems, hospitalized patients in all departments except the wards that was mentioned for nurses.

Exclusion criteria for both groups of patients and nurses were unwillingness to continue cooperation. Data were collected using demographic questionnaire, Lenik & Kiel Moral Intelligence Questionnaire and Nurse Professional Commitment Questionnaire (NPCS). We used Moral Competency Index of Lenik & Kiel to investigate moral intelligence with 40 questions including 10 items of moral competence. Distribution of scores of nurses’ moral intelligence were excellent (90-100), very good (80-89), good (70-79), and poor (>69).

The validity and reliability of the moral intelligence questionnaire were confirmed by Martin and Benjamin. The NPCS was first designed by Lachman and Aranya in 1968 with a reliability of 0.86. This questionnaire was first used in Iran by Shali and Joolaei with acceptable reliability, so that Cronbach’s alpha coefficient was 0.72.
Statistical Analysis: Data were coded and analyzed through SPSS version 16 (SPSS Inc., Chicago IL, USA). Descriptive statistics (frequency, mean, and standard deviation) and analytical statistical tests were used to access the research objectives. Kolmogorov-Smirnov test was used to determine if the data were obtained from a normal distribution. According to the normal distribution of the data, Pearson’s correlation coefficient was used. Stepwise regression was used to investigate the predictive power.

Results

The mean and standard deviation of nurses’ age, nurses’ work experience and patients’ age were (29.56±5.48), (5.53±4.87) and (43.74±16.88) respectively. The education of 90 nurses was bachelor’s science and 10 was master’s science, and 27 nurses participated in seminars or workshops (Table 1). Most nurses had a good level of moral intelligence (Table 2). The mean score of moral intelligence and professional commitment among nurses was 71.79±8.87 and (84.50±11.42) respectively (Table 3). There was a significant direct relationship between the overall score of moral intelligence and professional commitment (r = 0.47 and p = 0.001) (Table 4). Multiple correlation coefficient results indicated that based on the first model, the dimensions of nurses’ moral intelligence explained 41% of the variance of nurses’ professional commitment, and of the four dimensions of nurses’ moral intelligence, only the compassionate dimension had the most significant effect (P = 0.03, β= 0.32) (Table 5).

Table 1: Descriptive results of nurses

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<tr>
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<td>73</td>
<td>73</td>
</tr>
</tbody>
</table>

Table 2: Frequency of moral intelligence among nurses

<table>
<thead>
<tr>
<th>Moral intelligence</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor (&gt;69)</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Good (70-79)</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>Very good (80-89)</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Excellent (90-100)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3: Mean of moral intelligence and professional commitment among nurses

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Righteousness</td>
<td>29.75</td>
<td>3.79</td>
</tr>
<tr>
<td>Responsibility</td>
<td>21.32</td>
<td>3.05</td>
</tr>
<tr>
<td>Compassion</td>
<td>13.53</td>
<td>2.13</td>
</tr>
<tr>
<td>Forgiveness</td>
<td>7.19</td>
<td>1.27</td>
</tr>
<tr>
<td>Overall moral intelligence</td>
<td>71.79</td>
<td>8.87</td>
</tr>
<tr>
<td>Overall professional commitment</td>
<td>84.50</td>
<td>11.42</td>
</tr>
</tbody>
</table>

Table 4: Correlation between professional commitment and moral intelligence among nurses

<table>
<thead>
<tr>
<th>Correlation</th>
<th>R</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moral intelligence and professional commitment</td>
<td>0.47</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Table 5: Results of regression test based on predictive regression coefficients

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>R2</th>
<th>B</th>
<th>SE</th>
<th>Beta</th>
<th>t</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.41</td>
<td>2.08</td>
<td>0.34</td>
<td>-</td>
<td>6.01</td>
<td>0.001</td>
</tr>
<tr>
<td>Righteousness</td>
<td>0.35</td>
<td>0.12</td>
<td>0.038</td>
<td>0.27</td>
<td>0.78</td>
<td></td>
</tr>
<tr>
<td>Responsibility</td>
<td>0.012</td>
<td>0.12</td>
<td>-0.001</td>
<td>-0.007</td>
<td>0.995</td>
<td></td>
</tr>
<tr>
<td>Compassion</td>
<td>0.22</td>
<td>0.10</td>
<td>0.32</td>
<td>2.16</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>Forgiveness</td>
<td>0.072</td>
<td>0.11</td>
<td>0.08</td>
<td>0.64</td>
<td>0.51</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

In this study, the level of nurses’ moral intelligence was assessed at a good level. The results of the present
study are consistent with the results of Mohammadi et al. and Khosravani et al. who rated the level of moral intelligence at a good level. The findings of the present study were not in line with the findings of the study by Bahrami et al., who assessed the level of moral intelligence of faculty members and staff of Yazd Shahid Sadoughi University of Medical Sciences at very good level. The differences in findings regarding the level of moral intelligence can be related to the different community and study sample. Nursing is a profession in which ethics is an important principle in providing care to patients. The result can therefore be a confirmation of the morality of the profession. According to the search, no external study that examined nurses’ moral intelligence was found. Therefore, the researchers were satisfied to compare the level of moral intelligence in this study with the studies in Iran.

The professional commitment of the nurses under study was good and more than average value. In the study by Shali et al, the mean total score for professional commitment of nurses was 86 indicating high level of professional commitment of nurses under study. A study by Lu et al, conducted in Taiwan to assess the professional commitment of nurses revealed that nurses had a high level of professional commitment. In the study by Moradi et al., the professional commitment of nurses working in Qazvin educational centers was evaluated at a moderate level. Al-Hamadan also reported a moderate level of professional commitment of nurses working in private centers and educational hospitals in Jordan. In this study, there was a significant and direct relationship between the total score of moral intelligence and professional commitment and the dimensions of nurses’ moral intelligence explained 41% of the variance of nurses’ professional commitment, and of the four dimensions of nurses’ moral intelligence, only the compassionate dimension had the most significant effect. In the study of Lakeh et al., the results of multivariate linear regression model showed the effects of honesty and compassion subscales of moral intelligence on job satisfaction of university faculty members. Compassion means paying attention to others and creating an atmosphere in which people care about those around them, such as colleagues or patients. Compassionate people give priority to others. As a result, they show greater devotion to the profession, patients and colleagues and seems to have more job satisfaction.

**Conclusion**

In general, the results of this study showed the predictive power of moral intelligence on the important concept of professional commitment of nurses. Appropriate training programs that enhance nurses’ moral intelligence level simultaneously affect the important concepts of professional commitment.

**Competing Interests:** Authors have declared that no competing interests exist.

**Source of Funding:** Not

**Ethical Clearance:** The study was conducted in accordance with the principles of Declaration of Helsinki, 1996 version and its later amendments and also Good Clinical Practice standards. Each subject signed consent form before they were admitted into the study. Ethics approval was also received from Urmia University of Medical Sciences and ethics committee. All patients would be excluded from research if they did not consent to continue their research. The results of this study were presented to the patients.

**References**


The Development of Early Detection Tool for Stunting Prediction

La Banudi\(^1\), Bedjo Santoso\(^2\), Purnomo Leksono\(^1\), Matius Rantesalu\(^3\), Sukri Palutturi\(^4\)

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Abstract

Stunting is a nutritional problem in Indonesia which prevalence has experienced an increased every year. One way to overcoming nutritional problems, especially stunting, is the availability of technology, including early detection [tool] for prediction of stunting. The general objective of this research was to develop an early detection tool for predicting stunting. This research was a cross-sectional study. This research was conducted in Kendari and Semarang, from April to December 2019. The research population was children under two years-old in Kendari and Semarang. The samples of this research were children under two years-old in Kendari and Semarang. The data analysis was done using the SPSS program. The research results are: The prediction of stunting is formed when the maternal height variable is a predictive factor for stunting \(p_{v} = 0.004 \ C I\) (1.573–11.438); shorter maternal height with a tendency of 4.242 times. Feeding is a predictive factor for stunting \(p_{v} = 0.047 \ C I\) (1.015–14.229); feeding to baby is only breast milk with a tendency of 3.800 times. The maternal education is a predictive factor for stunting \(p_{v} = 0.012 \ C I\) (1.153–3.225); lower maternal education with a tendency of 1.929 times. The use of drinking water is a predictive factor for stunting \(p_{v} = 0.027 \ C I\) (1.072–3.213); the use of unfiltered drinking water with a tendency of 1.858 times. The prediction of stunting is formed when the variable of maternal height is short, feeding to baby is only breast milk and milk, Antenatal Care is lacking, maternal education is low, the drinking water used is unfiltered, the type of toilet used is other than gooseneck toilet and the birth weight is LBW, then the prediction of stunting would be 85%. Suggestions given in this research are that –from the models(variables) taken, namely inappropriate feeding, inadequate ANC and low maternal education can predict stunting status thus it is necessary to make improvements to these variables.

Keywords: Stunting, baduta, early detection.

Introduction

Stunting is one of the nutritional problems faced by all countries\(^1\)-\(^3\), particularly in poor and developing countries. Stunting is a problem with an increased risk of illness and death, slow brain development resulting in delayed motor development and stunted mental growth. Stunting is a predictor of poor quality of human resources which in turn will affect the development of a reliable nation’s potential\(^4\). It is estimated that 40% of children under five years-old suffer a loss of developmental potential; and stunting is a major risk factor\(^5\),\(^6\).

The nutritional status of children with short parent(s), one or both, are more at risk of growing short (having stunted growth) than children with parents of normal height\(^7\). If the parents are short because of the genes on the chromosomes that carry the short trait, it is likely that the short trait will be passed on to their children. But if the short trait of the parents is caused by food consumption or pathological problems, then the short trait will not be passed on to their offspring or children\(^8\).

A study conducted in Ethiopia identify factors associated with high stunting in breast-fed babies. The results show that babies of mothers who have low zinc levels in their breast milk are more likely to be stunted\(^9\). One of the problems in infant feeding is the cessation of
breastfeeding and insufficient complementary feeding. WHO recommends exclusive breastfeeding for the first 6 months of life and continued with the introduction of complementary foods in addition to breast milk until the age of 2 years.

Basic Health Research data in 2013 shows that the prevalence of stunting by province and national was 37.2%, meaning there was an increase compared to 2010 with 35.6% and 2007 with 36.8%. The prevalence of stunting was 37.2%, consisting of 18.0% being very short and 19.2% being short. In 2013, the prevalence of very short (stunted) decreased, from 18.8% in 2007 to 18.5% in 2010. The prevalence of short (stunted) increased from 18.0% in 2007 to 19.2% in 2013\(^{10}\). The results of monitoring the nutritional status in 2015, the description of the national nutritional status for the very short category reached 10.1% and 18.9% for the short category. Meanwhile, the nutritional status of children aged 0 — 59 months by province in 2015 reveals that the prevalence of very short children under five y.o in Southeast Sulawesi was 9.2% and the prevalence of short children in 2010 explains that the prevalence of stunting in Indonesia was 35.6%. The prevalence of stunting in Central Java is considered high, namely 33.6%, with 17% of short children and 16.9% of very short children. One of the areas in Central Java with a high prevalence of stunting is Semarang. Meanwhile, the sub-district with the highest prevalence of stunting is East Semarang sub-district which is 40.16%.

Harahap’s research results on the Disorders of Growth and Development in Children Aged 0.5– 1.9 Years Associated with Poor Food Intake and Parenting explain that protein intake, socio-economic status and child care are risk factors for growth and developmental barriers in children\(^{11}\). Other researches explain that The factor most influencing the occurrence of stunting in children under five years-old in rural and urban areas is the level of zinc adequacy\(^{12}\).

Indicators of the program success can be seen between the suitability of the process and the planned program, the conformity with objectives, the use and utilization of resources effectively and efficiently, and the ability to guarantee the conformity of processes and achievement of goals – through a harmonious control mechanism in one measuring instrument. One system to monitor early detection of stunting assessment activities is in the form of a screening module\(^{13,14}\).

Stunting early detection information system is a tool to track stunting prediction, procedures and policies used to manage early detection of stunting to support the implementation of monitoring of nutritional status (stunting) in an integrated and comprehensive manner within the framework of early detection of stunting. This program will describe the early detection of stunting and intervene when there are indications of stunting\(^{15,16}\).

**Materials and Method**

This research was a cross-sectional study. This research was conducted in Kendari and Semarang from April to November 2019. The population of this research was children under two years-old with a large sample size; 245 people (Kendari with 125 people and Semarang with 125 people). The sampling technique in this research was purposive sampling. The data analysis was done using the SPSS program. The data that has been analyzed are presented in tables and narratives to discuss the results of the research.

**Results**

This research was conducted at two locations, namely Kendari and Semarang. The sample characteristics are shown in Table 1.

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Nutritional Status H/A</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stunting</td>
<td>105</td>
<td>57.1</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>140</td>
<td>42.9</td>
</tr>
<tr>
<td>2.</td>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>131</td>
<td>53.5</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>114</td>
<td>46.5</td>
</tr>
</tbody>
</table>
The determination of nutritional status according to the H/A index reveals that those who experience stunting are 42.9% while those who are normal are 57.1%. The gender of the sample is almost equal between male and female, wherein for the male is 53.5% while the female is 46.5%. The percentage of sample age group of 6-12 months is 51.0% and 12-24 months is 49%. Meanwhile, for the categorization of maternal age of <20 y.o is only 2%, 20-35 y.o is 84.9% and >35 y.o is only 13.1%. Most of the maternal education is in the moderate category at 65.7%, while those in the low category are 12.2% and those in the high category are 22.0%. Most of the paternal education is in the moderate category at 66.2%, while those in the low category are 11.4% and those in the high category are 22.4%.

After the multiple logistic regression test was carried out in 5 steps with variables consisting of the maternal height, feeding, pregnancy desire, Antenatal Care (ANC), maternal education, death of siblings, use of drinking water, type of toilet and birth weight, the models for the formation of stunting in this research are presented in Table 2.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>PV</th>
<th>OR</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal height</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Less (short)</td>
<td>1.445</td>
<td>0.004</td>
<td>4.242</td>
<td>1.573 – 11.438</td>
</tr>
<tr>
<td>- Normal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeding</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Solid food</td>
<td>1.335</td>
<td>0.047</td>
<td>3.800</td>
<td>1.015 – 14.229</td>
</tr>
<tr>
<td>- Breast milk/milk</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Low</td>
<td>0.657</td>
<td>0.012</td>
<td>1.929</td>
<td>1.153 – 3.225</td>
</tr>
<tr>
<td>- Moderate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- High</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The use of drinking water</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Unfiltered</td>
<td>0.618</td>
<td>0.027</td>
<td>1.856</td>
<td>1.072 – 3.213</td>
</tr>
<tr>
<td>- Filtered</td>
<td></td>
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</tr>
</tbody>
</table>
The emerging models inform that maternal height is a predictive factor for stunting $p_v = 0.004, \text{CI} (1.573 - 11.438)$. Children of mothers whose height is less (short) are likely to experience stunting as much as 4.242 times greater compared to children of mothers with normal height.

Feeding is a predictive factor for stunting $p_v = 0.047, \text{CI} (1.015 - 14.229)$. Babies who are fed with only breast milk or milk have a tendency to experience stunting as much as 3.800 times greater compared to those who are fed with solid food in addition to breast milk/milk.

Maternal education is a predictive factor for stunting $p_v = 0.012 \text{CI} (1.153 - 3.225)$. Children of mothers with low education have a tendency to experience stunting as much as 1.929 times compared to children of mothers with high education.

The use of drinking water is a predictive factor for stunting $p_v = 0.027, \text{CI} (1.072 - 3.213)$. Babies who use unfiltered (unsafe) drinking water have a tendency to experience stunting as much as 1.858 times greater compared to those who use filtered water.

After the calculation of the models, so as to see the prediction of stunting from all variables then the following equation (Eq) is used:

$$y = \text{constanta} + B (BH) + B (\text{Feeding}) + B (\text{maternal education}) + B (\text{the use of water}) + B (\text{birth weight})$$

$$y = -3.047 +1.443 +1.375 + 0.657 + 0.618 +1.003$$

$$y = 0.133855$$

$$p = 1/1 + e^{-y}$$

$$p = 1/1 + (0.133855)$$

$$p = 85\%$$

From this calculation, it shows that if the variable of maternal height is short, feeding to baby is only breast milk and milk, Antenatal Care is lacking, maternal education is low, the drinking water used is unfiltered, the type of toilet used is other than gooseneck toilet and the birth weight is LBW, then the prediction of stunting would be 85%.

**Discussion**

The determinants of health, including stunting, are very complex, ranging from health, sanitation, parenting patterns to political issues\textsuperscript{17-26}. The emerging models inform that maternal height is a predictive factor for stunting $p_v = 0.004, \text{CI} (1.573 - 11.438)$. Children of mothers whose height is less (short) are likely to experience stunting as much as 4.242 times greater compared to children of mothers with normal height.

The height of the parents is closely related to the physical growth of the child. A short mother is one of the factors associated with and predicts the occurrence of stunting\textsuperscript{27}. The results of this study are in line with Rahayu (2011), which states that children born to short mothers or fathers are at risk of becoming stunted. One or both parents who are short due to a pathological condition (such as growth hormone deficiency) have a gene on the chromosome that carries a short trait, increasing the chances of the child inheriting the gene and growing stunted. However, if the parent is short due to nutritional deficiencies or disease, the child may grow to a normal height as long as the child is not exposed to other risk factors. As many as 40% of children have stunted growth (loss of developmental potential) due to stunting\textsuperscript{6}.

Another research also concludes that a short mother, short father, low education level and low income are risk factors associated with the occurrence of stunting in children\textsuperscript{28}. Other studies also state that genetic factors in mothers, namely height, have a strong correlation and can predict the occurrence of stunting in children under five\textsuperscript{5,29}.

Feeding is a predictive factor for stunting $p_v = 0.047, \text{CI} (1.015 - 14.229)$. Babies who are fed with only breast

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>PV</th>
<th>OR</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- LBW</td>
<td>1.003</td>
<td>0.029</td>
<td>2.727</td>
<td>1.108 – 6.712</td>
</tr>
<tr>
<td>- Normal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constanta</td>
<td>-3.047</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### Table 1: Coefficients and confidence intervals for predictive factors of stunting.
milk or milk have a tendency to experience stunting as much as 3,800 times greater compared to those who are fed with solid food in addition to breast milk/milk.

This the test results are in accordance with other studies that reveal the level of food consumption, for example lack of vitamin C, is a risk factor for the occurrence of stunting with an OR value of 2.97, meaning that the respondents with lack of vitamin C consumption have a risk of stunting 2.97 times greater compared to those with sufficient level of vitamin C consumption30,31.

Food consumption that must be well cared for in children is the consumption of calcium nutrients (the most abundant mineral in the body – about 99%). The total calcium in the body is found in hard tissues, namely bones and teeth. Lack of calcium during growth period can cause growth disorders. Calcium plays a role in phosphate metabolism by forming solubility in the form of bone mineralization30,32.

The research conducted in Guatemalan explain that children with insufficient consumption will experience stunting (F = 7.069, p = 0.013), for example children who do not consume a sufficient amount of protein source, will likely to experience stunting. Likewise, for not consuming sufficient amount of milk.33. Whereas, a research in Uganda on millet porridge as the main food for children reveals that they could only meet <60% of the recommended daily nutritional intake34.

The research on the Predictors of stunting for children aged 6 – 59 months in the Sodo Zuria District, Southern Ethiopia illustrates that children who receive pre-lacteal feeding are predictors of stunting (AOR = 3.8; 95% CI: 1.2 – 12.2). This happens because children are introduced to complementary foods that are not suitable for the age of feeding35. Meanwhile, the nutritional status of children living in institutionalized care is revealed to have half of the study results on dietary information with inappropriate intake or dietary diversity. Likewise, younger children will experience higher stunting than older children36.

Maternal education is a predictive factor for stunting pv = 0.012, CI (1.153 – 3.225). Children of mothers with low education have a tendency to experience stunting as much as 1.929 times compared to children of mothers with high education. Maternal education level is determined by formal education that has been completed. The level of maternal education is the basis for achieving good nutrition for children because theoretically, the low level of maternal education is a risk factor and can predict the children’s growth. The provision (feeding) of appropriate ingredients and food menus for children in an effort to improve their nutritional status will be realized if the mothers have a good level of education and knowledge. Maternal education and knowledge level influence attitudes and behaviors in choosing quality food ingredients which will affect the nutrition of their family.37

The research on Children Malnutrition in the Metropolitan City of Southeast Nigeria explains that the risk factor for malnutrition is maternal education. Where it is explained that mothers with sufficient level of education will easily seek daily information (about appropriate nutrition for their family) compared to those with low level of education38.

The level of education is related to how mothers can easily get and receive access to information about nutrition and health from outside. Mothers with higher level of education are more likely to receive information from others, compared to mothers with low level of education. The level of education in families of children under five years-old who experience stunting is mostly in the low category, this is due to the economic limitations, including eating which sometimes is just what it is.39

The use of drinking water is a predictive factor for stunting pv = 0.027, CI (1.072 – 3.213). Babies who use unfiltered (unsafe) drinking water have a tendency to experience stunting as much as 1.858 times greater compared to those who use filtered water. Clean drinking water sources are important factor for body health in order to reduce the risk of various diseases such as diarrhea, cholera, and typhus. Children are susceptible to infectious diseases because naturally their immune system is classified as low. The deaths and morbidity of children are generally associated with contaminated drinking water sources and inadequate sanitation.40.

Filtered drinking water sources are healthy environmental sanitation that indirectly affecting the health of children under five years-old, which in turn can affect their nutritional status, in this case – the occurrence of stunting. Nutritional problems, apart from being caused by a lack of nutrient intake, can also occur due to poor environmental sanitation. In this case, unfiltered sources of drinking water and bad personal hygiene make it easier for infectious diseases to occur. This is in line
with other studies which state that there is a relationship between environmental hygiene and sanitation with the occurrence of stunting as these condition can predict the occurrence of stunting in children.

Based on the results of the calculation that if the variable of maternal height is short, feeding to baby is only breast milk and milk, Antenatal Care is lacking, maternal education is low, the drinking water used is unfiltered, the type of toilet used is other than gooseneck toilet and the birth weight is LBW, then the prediction of stunting would be 85%.

**Conclusion**

Based on the results and discussion, the conclusion of this study is that the prediction of stunting is formed when the variable of maternal height is short, feeding to baby is only breast milk and milk, Antenatal Care is lacking, maternal education is low, the drinking water used is unfiltered, the type of toilet used is other than gooseneck toilet and the birth weight is LBW, then the prediction of stunting would be 85%. The suggestions given in this study are that from the models (variables) taken, namely inappropriate feeding, inadequate ANC and low maternal education are proven to be able to predict stunting status, thus it is necessary to make improvements to these variables.

**Ethical Clearance:** Taken from institution ethical clearance

**Source of Funding:** Self funding

**Conflict of Interest:** Nil

**References**

19. Palutturi S. HEALTH POLITICS: TEORI DAN


Factors Affecting Subjective Well-Being of the Middle-Aged Class

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Abstract

Background/Objectives: The purpose of this study is to identify the factors influencing the subjective well-being of the middle-aged class and to identify the relative influence of the variables.

Method/Statistical Analysis: The subjects of this study consisted of a middle-aged class group, aged 40 to 64, among the panels of an online research company, and data was collected from a total of 196 subjects. The collected data were analyzed using descriptive statistics, t-test, ANOVA, post-test Scheffé test, Pearson’s correlation coefficient and stepwise multiple regression using SPSS 22.0.

Findings: The average score of the subjective well-being of the middle-aged class was 3.34. The difference in subjective well-being according to general characteristics was found to be significant according to education (F=4.89, p=.009) and economic status (F = 9.76, p<.001). Subject’s subjective well-being was positively correlated with health status (r=.56, p<.001), meaning in life (r=.66, p<.001), generativity (r=.76, p<.001), self-efficacy (r=.62, p<.001), and social support (r=.57, p<.001). As a result of stepwise regression analysis, generativity (β=.424, p<.001), health status (β=-.209, p<.001), social support (β=.190, p=.001), and self-efficacy (β=.150, p=.014) were factors affecting subjective well-being, and the explanatory power of these 4 variables was 62.6%. The most influential variable was generativity.

Improvements/Applications: This study considered variables in various fields to provide nursing intervention to promote subjective well-being of the middle-aged class, and as a result, it will contribute to promoting a qualitative life by improving the health potential of the middle-aged class.

Keywords: Subjective well-being, health status, generativity, meaning in life, self-efficacy, social support.

Introduction

The middle-aged class has served as a key generation of growth in countries and businesses, and an economic backbone in the home. However, the middle-aged class generation is also a generation that suffers from various difficulties as physical health is weakened, the loss of roles and anxiety about economic sources of income are heightened while preparing for retirement in the labor market.

Especially in middle age, people feel that they have somewhat reached personal achievement, feel emotional stability through social stability, aim to find their identity, and feel true happiness when they find meaning in life\(^1\). Efforts to find meaning in life become the power to lead life well as an opportunity to grow by discovering its meaning in adversity or pain experienced in life\(^2\). The meaning in life is an indicator of psychological health related to happiness and is a variable that has an important influence on quality of life and well-being\(^3\).

In general, the social-psychological development task of middle-aged people is generativity versus...
stagnation, and generativity is the degree of personal internal development that is important for having an identity as a middle-aged adult and indicates the maturity of psychosocial adaptation. However, if the generativity is not obtained at this time, the person may fall into a sense of stagnation and self-righteousness, and the relationship with spouses and others becomes difficult and can suffer psychological difficulties such as atrophy, anxiety, depression, and decreased self-esteem. Generativity is a concept that exists within an individual, but in a social relationship, an individual can increase psychological well-being and increase generativity by perceiving the support of social support systems or resources.

Well-being is divided into two categories, subjective well-being focusing on “hedonic” results and psychological well-being emphasizing “eudaimonic” results. In particular, subjective well-being is a concept that encompasses emotional experiences and cognitive judgments related to life, and cognitive judgment means evaluation of life satisfaction, and emotional experience means static and negative emotional reactions in life conditions. Personal factors affecting subjective well-being include physical change and health status, and health status is becoming a source of effective coping skills by increasing social activity and giving positive meaning in life and value through interpersonal relationships and interactions with others. In addition, subjective well-being is affected by self-efficacy, expectations, environmental support and resources, and social support is an important influencing factor.

So far, many studies on quality of life have been conducted in nursing, but studies on well-being considering the developmental tasks and comprehensive concepts of middle-aged classes are rare. For helping middle-aged classes achieve their development tasks and give them new meaning in life, and in order for them to experience well-being and prepare for successful aging, nursing intervention is needed considering various aspects. Therefore, this study aims to find an intervention that can improve the well-being of the middle-aged class by identifying factors affecting subjective well-being of the middle-aged class.

Method

Subjects: The subject of this study is a panel of a specialized online research company, and is a middle-aged class aged 40 to 64 years old. The minimum number of samples is 178 when calculated by setting the statistical power for regression analysis to 90%, medium effect size 0.15, significance level 0.05, and 11 predictors using the G*Power 3.12 program, and a total of 196 questionnaires were included in the final analysis subject considering the dropout rate of 10%.

Tools:

Subjective well-being: It is a 5-point scale of 30 questions developed by Bakand Hong. The higher the score, the higher the subjective well-being score. The reliability in this study was found to be Cronbach’s α = .75.

Health status: It is a 5-point scale of 4 questions that Chang and Oh developed. The higher the score, the better the subjective health status. The reliability in this study was found to be Cronbach’s α = .90.

Meaning in life: The Korean version meaning of life scale of Won et al. was used. It is a 7-point scale of 10 questions, and the higher the score, subjectively the more meaning in life. The reliability in this study was found to be Cronbach’s α = .87.

Generativity: It is a 5-point scale of 27 questions developed by Lee and Lee, and the higher the score, the higher the level of generativity. The reliability in this study was found to be Cronbach’s α = .95.

Self-efficacy: It is a 4-point scale of 10 questions developed by Schwarzer and Jerusalem, and the higher the score, the higher the level of self-efficacy. The reliability in this study was found to be Cronbach’s α = .90.

Social support: It is a 5-point scale of 12 questions developed by Zimet et al., and the higher the score, the higher the level of social support. The reliability in this study was found to be Cronbach’s α = .90.

Data collection: Data collection was conducted from June 12, 2020 to June 30, 2020, and it was deemed to have been agreed upon if the person who received the participation e-mail from the company among the panel the of online research company went online and proceeded to answer the questionnaire.

Ethical considerations: This study was approved by deliberation and written consent exemption from the Public Institutional Review Board of the Ministry of Health and Welfare (PO1-202006-22-009).
Data analysis method: The collected data were processed by computer statistics using SPSS/WIN 22.0 program. Descriptive statistics for the general characteristics and variables of the subjects were obtained. The difference in subjective well-being level was determined according to general characteristics t-test, ANOVA, and post-test Scheffé test. The correlation between the subjective well-being and the variables was analyzed by Pearson’s correlation coefficient. In addition, in order to identify factors affecting subjective well-being, it was analyzed by stepwise multiple regression after multicollinearity diagnosis.

Result

General characteristics of subjects: The distributions of the gender were 94 male (47.5%), 104 female (52.5%). Mean age of the subjects was 52.7(±7.93) years old and 60 to 64 years old group was the most among these with 196 persons (33.8%). University graduates were the most with 128 (64.6%); 152 (76.8%) had their spouses; 115 (58.1%) had no religion; and 156 (78.8%) had occupations. With respect to the economic status, 132 (66.7%) answered as

Table 1. General Characteristics and Difference in Degree of Subjective Well-Being according to General Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Categories</th>
<th>n(%)</th>
<th>Subjective well-being</th>
<th>M±SD</th>
<th>t/F</th>
<th>p</th>
<th>Scheffé</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>94(48.0)</td>
<td>3.34±0.48</td>
<td>0.04</td>
<td>.966</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>102(52.0)</td>
<td>3.33±0.46</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (Yr)</td>
<td>40-49</td>
<td>66(33.6)</td>
<td>3.26±0.42</td>
<td>2.11</td>
<td>.124</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>50-59</td>
<td>65(33.2)</td>
<td>3.32±0.40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>60-64</td>
<td>65(33.2)</td>
<td>3.43±0.55</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>High school²</td>
<td>43(21.9)</td>
<td>3.20±0.42</td>
<td>4.89</td>
<td>.009</td>
<td>a&lt;c</td>
<td></td>
</tr>
<tr>
<td></td>
<td>University²</td>
<td>126(64.3)</td>
<td>3.33±0.46</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Graduate school³</td>
<td>27(13.8)</td>
<td>3.55±0.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spouse</td>
<td>Yes</td>
<td>150(76.5)</td>
<td>3.33±0.47</td>
<td>0.21</td>
<td>.832</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>46(23.5)</td>
<td>3.35±0.45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td>Yes</td>
<td>81(41.3)</td>
<td>3.39±0.49</td>
<td>1.32</td>
<td>.188</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>115(58.7)</td>
<td>3.30±0.44</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td>Yes</td>
<td>155(79.1)</td>
<td>3.34±0.46</td>
<td>0.42</td>
<td>.678</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>41(20.9)</td>
<td>3.31±0.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic status</td>
<td>Low²</td>
<td>59(30.1)</td>
<td>3.13±0.48</td>
<td>9.76</td>
<td>&lt;.001</td>
<td>a&lt;b, e</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Middle²</td>
<td>131(66.8)</td>
<td>3.42±0.43</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High³</td>
<td>6(3.1)</td>
<td>3.62±0.43</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Descriptive statistics of the study variables: Subjective well-being averaged 3.34 (±0.47), health status averaged 3.22 (±0.66), and meaning in life averaged 4.58 (±0.92). In addition, the average generativity was 3.33 (±0.56), the self-efficacy was 2.71 (±0.39), and the social support was 3.48 (±0.69) (Table 2).

Table 2. Descriptive Statistics of the Study Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health status</td>
<td>3.22</td>
<td>0.66</td>
<td>1.25</td>
<td>5.00</td>
</tr>
<tr>
<td>Meaning in life</td>
<td>4.58</td>
<td>0.92</td>
<td>1.90</td>
<td>7.00</td>
</tr>
<tr>
<td>Generativity</td>
<td>3.33</td>
<td>0.56</td>
<td>1.19</td>
<td>4.93</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>2.71</td>
<td>0.39</td>
<td>1.70</td>
<td>3.90</td>
</tr>
<tr>
<td>Social support</td>
<td>3.48</td>
<td>0.69</td>
<td>1.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Subjective well-being</td>
<td>3.34</td>
<td>0.47</td>
<td>1.97</td>
<td>4.93</td>
</tr>
</tbody>
</table>
**Difference in degree of subjective well-being according to general characteristics:** The degree of subjective well-being was significantly different according to education ($F=4.89$, $p=.009$) and economic status ($F=9.76$, $p<.001$) (Table 1).

**Correlation between subjective well-being and variables:** Subjective well-being was positively correlated with health status ($r=.56$, $p<.001$), meaning in life ($r=.66$, $p<.001$), generativity ($r=.76$, $p<.001$), self-efficacy ($r=.62$, $p<.001$), and social support ($r=.57$, $p<.001$) (Table 3).

**Table 3. Correlations Coefficient among the Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Health status $r$ ($p$)</th>
<th>Meaning of life $r$ ($p$)</th>
<th>Generativity $r$ ($p$)</th>
<th>Self-efficacy $r$ ($p$)</th>
<th>Social support $r$ ($p$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjective well-being</td>
<td>.56 (&lt;.001)</td>
<td>.66 (&lt;.001)</td>
<td>.76 (&lt;.001)</td>
<td>.62 (&lt;.001)</td>
<td>.57 (&lt;.001)</td>
</tr>
</tbody>
</table>

**Influencing factors on subjective well-being:** To identify factors affecting subjective well-being, education and economic status, which showed significant differences in general characteristics, were converted into dummy variables, and a total of 7 variables, such as health status, meaning in life, generativity, self-efficacy, and social support, were input to perform regression analysis in a stepwise manner (Table 4). As a result, generativity ($β=.424$, $p<.001$), health status ($β=.209$, $p<.001$), social support ($β=.190$, $p=.001$), and self-efficacy ($β=.150$, $p=.014$) were identified as significant variables explaining subjective well-being. The explanatory power of these 4 variables was 62.6%, and the most influential variable was generativity ($β=.424$, $p<.001$). The concept of self-efficacy is applied in various fields in nursing or health-related fields, and since it acts as a determinant in creating behavioral change and characteristics was found to be significantly different according to education and economic status. In the study of Chang and Sohn$^{10}$ using the same tool for middle-aged men and women, subjective well-being was found to have a significant difference according to economic status, which was consistent with the results of this study. However, early studies of well-being reported that the influence of demographic variables on subjective well-being is low, so further studies are required$^{16}$.

The average of subjective well-being of the subjects was 3.34 points. In the study of Chang and Sohn$^{10}$, the score was 3.36, which was similar to the results of this study.

Subjective well-being was shown to correlate with health status, meaning in life, generativity, self-efficacy and social support. These results are consistent with the results that meaning in life is closely related to quality of life and well-being and health status$^{13}$. In addition, generativity correlates with social support$^{17}$, and subjective well-being correlates with meaning in life, self-efficacy, and social support$^{18}$, supporting the results of the study.

As a result of stepwise regression analysis to identify factors affecting subjective well-being, generativity, health status, social support, and self-efficacy were found to be significant variables for explaining subjective well-being. The most influential variable was generativity. Generativity is related to psychological well-being, self-esteem and life satisfaction, and subjective well-being can be felt in the process of obtaining generativity$^{6}$. The second influential variable was health status, which was shown in the study by Chang$^{18}$ as a variable influencing middle-aged well-being, which was consistent with the results of this study. Health status means physiological adaptation, and as the health status worsens, the quality of life is reported to decrease$^{11}$, supporting the results of this study. Social support appears to be an important factor influencing well-being and supports the results of this study$^{7}$. However, the result of the study by Chang$^{18}$ showed that social support did not affect middle-aged well-being, which was contrary to the results of this study. These results are estimated to be the result of different variables input as subjects, measurement tools used, and predictors, and further study is needed.

**Discussion**

Subjective well-being according to general...
synchronization for problem solving in the middle-aged class\textsuperscript{20,21}, it can be confirmed that it is a factor influencing subjective well-being.

On the other hand, although meaning in life was highly correlated with subjective well-being, it did not appear as a variable affecting subjective well-being in the middle-aged class. However, meaning in life is a decisive component\textsuperscript{13} of well-being, and repeated studies using the same measurement tool are needed for these contradictory results.

Through the above results, it is necessary to provide information and build a system to utilize the community infrastructure to establish the middle-aged identity and strengthen the support system. Furthermore, it is necessary to promote the physical and mental health of individuals to prepare for retirement and to actively reorganize and understand the meaning in life from middle to old.

**Conclusions**

Generativity, health status, social support, and self-efficacy were identified as significant factors predicting the subjective well-being of the middle-aged class.

This study is meaningful in that it considers physical, mental, and social variables to promote subjective well-being and prepare for successful aging by increasing generativity, a development task of middle-aged class. In particular, by identifying factors affecting subjective well-being of the middle-aged class, it provides a framework for exploring individualized nursing intervention method, and it will contribute to improving the quality of life by improving the health potential of the middle-aged class, their family and, furthermore, the elderly.

**Ethical Clearance:** Not required

**Source of Funding:** This work was supported by Hanseo University Research Fund in 2020.

**Conflict of Interest:** Nil

**References**


E-Learning Innovation in Indonesia: Journal Sharing of Critical Care (JSCC) for Nursing Students in the Pandemic Covid-19

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1Associate Lecturer, Certified Expertise Critical Care (CECC), 2Indonesian Critical Care Nurses Association (ICCNA), 3Baptist Hospital Health Collage in Kediri Indonesia

Abstract

The challenge during the COVID-19 pandemic was Nursing Students studying at home. The innovation of e-learning encourages Clinical Reasoning, patient safety, self-actualization, clinical decision, professionalism, and competences. The purpose of this study was to determine the effectiveness of the E-Learning Innovation: Journal of Sharing Critical Care (JSCC) in Critical Nursing Students during the Pandemic COVID-19.

Research Design uses Descriptive Analysis. The population was all professional nursing students. The sample size was 39 respondents using purposive sampling. Inclusion criteria are students who can complete the learning process for 2 weeks. The independent variable was JSCC. The dependent variable was primary assessment, diagnostic procedures, nursing care, Soft skills, and Outcome. Instrument use Edlink Application. Data analysis uses Partial Least Square (PLS).

The results showed that the variable The ability to explain theory had a positive relationship with The ability to make nursing care (ρ = 0,000), primary assessment with the ability to make nursing care (ρ = 0,000), The ability to explain diagnostic procedures with nursing care (ρ = 0,000), The ability to make nursing care with Soft skill (ρ = 0,000), and soft skill has with Outcome (ρ = 0,000) with t statistic> 1.96 in The ability to make nursing care (t statistic = 25,273), Soft skill (t statistic = 8,15), Outcome (t statistic = 9,267).

The innovation of learning method using e-learning journal sharing of critical care has a positive impact on explaining deeper cases, strengthening learning competencies, and critical thinking.

Keywords: e-hearing, critical nursing, journal sharing.

Introduction

Pandemic COVID-19 is an outbreak of coronavirus disease 2019 (COVID-19) which attacks many victims globally as well as in Indonesia1,2. The cause of the Plague was due to the rapid spread of COVID-19 to various countries and caused many deaths. The reason is because of the rapid spread of COVID-19 which is easily transmitted through saliva splashing or maybe also airborne. The plague is certain to continue to increase with the increase in COVID-19 victims, the Indonesian government in May 2020 issued a policy to work, worship, and study at home3. Local governments also follow the recommendations of the central government by making circulars related to physical distancing, using masks when leaving the house, washing hands with soap and running water, studying at home, worshiping at home, and working at home. The world of nursing education in Indonesia is also affected by government policy, so lecturers must innovate in the learning process at home for a long time. Nursing students who are currently going through the education process are also affected because of the COVID-19 Pandemic. The impact is felt by every student and lecturer in the learning process in Indonesia. The impact that is seen through the learning process is the change in learning method in nursing students who were initially conventional and are now fully engaged in using e-learning innovations. Nursing students are currently enrolled in critical nursing...
courses. Students have different challenges in 2020 in completing assignments and completing the existing learning process. Critical nursing students must also complete the workload they get during the COVID-19 Pandemic. If this pandemic is not finished soon, the learning process will be hampered and the need for learning innovations to find the best solution without leaving aside the competencies obtained by students.

WHO data on May 8, 2020, found COVID-19 cases in the world of 3,759,967 confirmed cases with 259,474 deaths. Data from the Ministry of Health on 9 May 2020 found COVID-19 cases in the Southeast Asia Regional of 86,294 confirmed cases with 3,075 cases died. WHO data on May 8, 2020, also shows that in Indonesia there were 12,776 confirmed cases of COVID-19 with 930 deaths with transmission classification as community transmission4,5. Whereas on May 11, 2020, COVID-19 cases in Indonesia found 14,032 confirmed cases with 1,176 deaths in 6. The health university in Kediri City has dismissed its students to study at home, but the learning process must still be carried out11. Some health schools in China formally cancel formal teaching in hospitals, have their exams suspended, and hinder the education of health students in the face of a pandemic, as well as in Canada, the effects of the Pandemic virus restriction cause cessation of clinical practice and choice for students for up to 6 weeks8. Cui’s research results in 2018 showed that the effectiveness of evidence-based nursing is superior to traditional teaching in students’ critical thinking9. Competence in practice using evidence-based practice or journal sharing is better than other method 10. The health university in Kediri City has dismissed its students to study at home, but the learning process must still be carried out11. STIKES Kediri Baptist Hospital has also closed students and carry out learning from home. The need for innovation related to the learning process of nursing students who are also supposed to practice in hosp. The role of lecturers in facing the challenges of using e-learning fully without using conventional method (lectures) during COVID-19 needs to make innovations that focus on student activity. The use of e-learning method, in full without any physical interaction (lecture method) requires a student-focused learning approach. The use of sharing journals can improve student self-efficacy, increase information literacy, improve perceptions of evidence-based practice (EBP), and intrinsic academic motivation to experience stimulation, and can predict the future implementation of EBP 7,12–14. Satisfaction increased significantly in satisfaction surveys that were routinely collected over one year related to the curriculum by providing material related to evidence-based nursing practice 15. The results of previous studies show that overall, there is no significant difference between groups with e-learning and conventional learning or face-to-face relating to the knowledge, skills, and satisfaction of nursing students, and also E-learning can be used in offering alternative education method15–17. The study uses an e-learning model with a journal sharing approach to work on nursing care reports, measure competence, and exam results in critical nursing periods. Students do a Journal Sharing or research results to students to be able to do in-depth analysis related to interventions or measuring tools obtained through journals and are expected to improve the quality of care and get the best means of intervention or measuring tools in carrying out nursing care in the critical nursing area. Implementation of Evidence-Based Practice Nursing must continue to be developed, implemented, and evaluated using validated method including the use of best practice standards 18. Learning to students using method like this needs to be developed to improve the quality of applications of research results in the area of health services. Learning method don’t have to be classed, can also use online media through e-learning to apply evidence-based practice using JSCC. Traditional learning in the class can be transferred to online media and is inseparable from the learning styles of students. Students feel that online programs can meet their needs in learning. Lecturers applying technological innovation in nursing education require an understanding of learning directly to students so they can satisfy and meet the needs of students.

Materials and Method

The study uses a descriptive-analytic research design. Descriptive Analytic Research was to use crosssectional research that analyses deeply related to several variables studied. The purpose of this study was to analyze the E-Learning Innovation: Journal of Sharing of Critical Care (JSCC) in Critical Nursing Students during the Pandemic Period of COVID-19. The study population was all final-year nursing students at STIKES Kediri Baptist Hospital. The research sample was nursing
students at the final level of Nursing at STIKES Baptist Hospital in Kediri using the Total Sampling Technique. Total Sampling is a sampling technique that uses the entire population as research respondents. The sample size of this study was 39 respondents. The independent variable of the study is critical nursing competency. Implementation of JSCC for 6 weeks, with a load of 6 critical nursing care. JSCC procedures namely 1) The learning process using paid edlink applications (https://edlink.id/login) 2) students get pseudo cases of critical patients through e-learning 2) students conduct critical nursing assessments based on case theory or diagnostic prognosis, primary assessment, and diagnostic procedures 3) students make nursing care through Main complaint assessment, problem priority analysis, outcome nursing care plan, nursing care plan, 4) students determine interventions by comparing interventions or measuring tools based on journals or research results and sharing them through video conversion with students and other lecturers 5) after students implement JSCC 6 months the students assessed Fatigue, competency and exam score scores. This research was conducted data collection from March to April 2020. Data collection using questionnaires based on Edlink Application and Google Form. The scoring technique uses an interval data scale from 0-10 (less to very good). The results of the study were tabulated and coded and then analyzed using Partial least square (PLS). The study has obtained a letter of ethics clearance from the Chakra Brahmanda Lentera Institute with letter number 001/25/V/EC/KEPK/Lemb.Candle/2020.

Results and Discussion

Results: Measurement of the outer reflective model using reliability and validity. Reliability using Cronbach’s alpha with a minimum value of 0.7, the value on the outer loadings obtained the latent variable value (the ability to explain the theory, primary assessment, diagnostic procedure, nursing care, soft skills, and outcome) ≥0.7. Convergent validity using the average variance extracted (AVE) value with a value of ≥ 0.5, which means that this value describes sufficient convergent validity and means that one latent variable can explain more than half of the variance of the indicators on the average. The results showed that composite reliability, which is a group of indicators measuring a variable, has good composite reliability because it has a composite reliability ≥ 0.7. The results showed that the Goodness of fit model was measured using the R-square dependent latent variable with the same interpretation as regression. Q-Square predictive relevance for structural models measures how well the observed value is generated by the model and also its parameter estimates. The value of Q-square> 0 indicates that the model has predictive relevance, otherwise, if the value of Q-square ≤ 0 indicates that the model lacks predictive relevance. The results showed that the results of T-statistics with α = 5% and t = 1.96, obtained a variable T statistic> 1.96 with a positive original sample estimate, so all variables have a positive relationship between variables (The ability to make nursing care with Soft skill; Soft skill with Outcome; Outcome with Soft skill).

![Figure 1. PLS E-learning “Journal Sharing of Critical Care (JSCC)”](image-url)
Discussion

The results showed that there was a strong relationship and validity and reliability were confirmed for each latent variable. The strong relationship between the ability to explain the theory to the ability to make nursing care, this explains that the ability of students to explain theory through e-learning using the edlink application in the journal sharing of critical care model in the practice of the nursing profession shows validity, reliability, and relationships strong and positive. The ability of students to explain the theory. Students can explain the concepts of medical diagnosis, etiology, clinical manifestations, pathophysiology \((p = 0.000)\). Students understand medical diagnosis in critical nursing using the JSCC E-learning model. Students demonstrate their ability to complete assignments, pre convergence assessment results, and video conferencing post conferences. Lecturers give questions related to cases theoretically and direct students in understanding the etiology of diagnostic problems, clinical manifestations to the course of the disease to have an impact on subsequent nursing care. Students can understand the signs and symptoms of the case and refer to it as major and minor data to establish a nursing diagnosis. Nursing care is inseparable from the ability of students to understand the basic medical diagnosis cases that arise, students can see the prognosis of the disease, and the direction of the disease will develop.

The results also showed that there was a close and positive relationship between the ability to explain the primary assessment and the ability to make nursing care. The ability of students in conducting critical nursing care assessments by conducting primary assessment studies including airway studies, breathing studies, circulation studies, disability studies, and exposure studies. Critical nursing students must be able to perform competencies or actions for each primary assessment carried out, this is important because it deals with critical conditions in patients. A close and positive relationship based on statistics shows that students studying during the Pandemic COVID-19 period were still able to have the standardized abilities of higher education in health Baptist hospital health colleges in Kediri. Students learn from home but they can carry out assignments and achieve predetermined primary assessment competencies. Teaching online research does not improve attitudes toward research, but nursing students report an increase in understanding of research terminology 19–21. Critical care nursing research tends to increase collaboration with patients and families, illustrating the shift towards user values 22–24. Students in conducting nursing care also focus on the primary assessment that has been done. Nursing care plans made by students must be based on a journal or research results. Students use evidence-based practice and are directed as needed for each primary assessment that has been obtained. JSCC allows students to analyze journals using PICO (population, intervening, control, outcome) data extraction and is compared to each nursing care plan that will be provided.

The results showed that there was a relationship with a strong and positive relationship between the ability to explain diagnostic procedures and the ability to make nursing care \((p = 0.000)\). Students get pseudo cases through e-learning media with the method of journal sharing for critical care. Students analyze laboratory and diagnostic results to analyze the relationship with problems that occur in patients. Students connect the
problem of abnormal conditions related to the diagnostic results obtained and finally determine the problems in nursing care. Students make follow-up plans for nursing care based on evidence-based practice following the problems found. Educational interventions to improve the competence of mentors must be designed \(^{16,25,26}\). Evidence-based practice is very important for nursing education because Florence Nightingale is a pioneer of evidence-based practice and technology is a key component of the evolution of evidence-based practice \(^{27,28}\). Diagnostic procedures that were analyzed included abnormal values of cardiac output, fluid balance, acid-base, blood chemistry, IWL, mean arterial pressure, fluid balance, and CBC.

The results showed that the ability to make nursing care with soft skills had a strong and positive relationship \((P = 0,000)\). Sub variables that are in it indicate that there are a high validity and reliability related to the making of nursing care with the ability of students in the realm of soft skills. The ability of students in making nursing care has sub-variables as a measuring tool including the meaning of the main complaints, analysis of priority problems, the objectives of nursing care, and planning of interventions based on evidence-based practice. Students can also achieve their soft skills in the form of clinical reasoning skills, patient safety, self-development, and self-actualization. Students plan critical nursing care in a structured manner with an evidence-based practice approach from sharing journals that have been made previously. E-learning based learning method for students of the critical nursing profession with a journal sharing of critical care approach in the area of intensive care to improve evidence-based understanding based on practice must be carried out due to the existence of Pandemic COVID-19 which makes students unable to achieve their competence in the practice field and have an impact on learning conditions \(^{22,29}\). This learning method shows the existence of learning preferences, interactive learning, course design, patient safety, and future learning needs. The e-learning program captures the learning styles and needs of students. Evidence-based practice underscores the modern approach to nursing to ensure the provision of safe, up-to-date, and person-centered care in a developing clinical environment.

Professional students at the critical nursing stage carry out nursing care with secondary and primary data. Students generally do nursing care without using research or journal results when doing nursing care. But at this time because there is a Pandemic, students use secondary data and the use of journals without doing practice. Students are more focused on conventional nursing care in general, which makes sharing information related to research results less. Journal sharing is expected to increase knowledge and information related to new things from information that can be applied to nurses based on evidence. Critical nursing care by sharing journals with students, students can be more exposed and easier to understand in doing nursing care with the best action on patients. Evidence-based practice can support the nursing profession to ensure the provision of safe, current, patient-centered care \(^{15,30}\). The nursing curriculum includes this as a good learning method for students and easy internet access in implementing it. Lecturers and students are connected in a flow and can discuss well related critical care to be provided. Professional students will further enhance the understanding between evidence and clinical practice and will ultimately increase self-confidence in students when students take care of patients in clinical settings. The learning method for professional students is by sharing a journal of Critical Care (JSCC). In the condition of Pandemic COVID 19 online student learning method based on professional profession. Digital learning innovation method with online media can be used. The method of the Sharing Journal of Critical Care (JSCC) can still be used with students conducting a journal analysis and making nursing care based on evidence-based practice.

The results also showed that the ability of the student soft skill to influence the outcome was in the form of the final score of the critical nursing competency test and the level of student fatigue. Higher education bridges the practice gap in increasing knowledge, through learning method using journal sharing of critical care based on evidence-based practice to remind knowledge of college students. Findings from small-scale research studies also indicate that e-learning does meet a variety of learning styles and the needs of nursing students, but we all also understand that online learning alone is not enough nor should a mixed approach to learning also be adopted to meet and bridge the gap in theoretical practice which supports the integration of knowledge into clinical practice. The application of the Journal of Sharing of Critical Care needs to also understand changes to research ideas that have been formed beforehand into something accessible and useful, clear links between research and clinical and professional nursing practice, comments on subject and learning formats, improved
skills in search and exploration effective evidence, and improvement for the future. The evidence-based practice supports nursing to ensure the provision of safe, current, and patient-centered care. The critical nursing curriculum includes evidence-based research but students often have difficulty understanding the relevance of research. Making the connection between research and clinical practice open to students increases their overall satisfaction. Improving understanding between clinical evidence and practice increases student confidence in questioning the clinical practice.

Models based on sharing journals or based on evidence in nursing care offer academic support and coping strategies in advanced nursing programs. (Cantwell et al., 2020). The American Association of Colleges supports active learning strategies and strategies must also use student-centered strategies. Although the surveyed nursing students reported moderate ability beliefs, their intention to adopt and integrate EBP in their future nursing practices was relatively high (Labrague et al., 2020). Evidence-based nursing is an important competency for nurses to provide high-quality care. Various educational efforts to improve the evidence-based practice of nurses are ongoing internationally. An evidence-based practice curriculum can be combined and integrated with core nursing courses. Implementing blended learning in EBP education among nursing students is effective.

**Conclusion and Acknowledgment**

**Conclusion:** The ability to explain the theory, the ability to explain primary assessment, the ability to explain diagnostic procedures have a strong and positive relationship to the ability to make nursing care. Students can make nursing care that has a positive impact on Soft Skills, and Outcome.

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**Ethical Clearance:** Ethical Clearance has taken form from the Chakra Brahmanda Lentera Institute with letter number 001/25/V/EC/KEPK/Lemb.Candle/2020.

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**Conflict of Interest:** This Research has no conflict of interest

**Reference**


Regional Exposure to Air Pollution and Health Behaviors as a Risk Factor for Suicide Attempt: The Seventh Korean National Health and Nutrition Examination Survey (KNHANES), 2016-2017, Korea Centers for Disease Control and Prevention

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Abstract

Background/Objectives: The purpose of this study is to identify the influencing factors of fine particle concentration level by region and health behaviors on suicide attempts.

Method/Statistical Analysis: This study used the 7th (2016-2017) primitive data disclosed by the National Health Nutrition Examination Survey. Considering the design features of the sample data, it is analyzed with a complex sampling method by reflecting stratas, clusters, and weight. The data were analyzed using logistic regression analysis of the complex sample using the SPSS/WIN 18.0 program.

Findings: As a result of logistic regression analysis, the provability of suicide attempt was 12.32 times (95% CI 5.33-28.49, \( p < .001 \)) higher in depression diagnosis group, 5.55 times (95% CI 1.87-16.46, \( p = .002 \)) higher in 10 or more drinks in single session group, 2.48 times (95% CI 1.07-5.73, \( p = .003 \)) higher in high perceived stress group, and 0.1 unit increase in Health-related Quality of life (\( \beta = -2.35, p = .030 \)) resulted in 0.79 times factor on suicide attempt rate.

Improvements/Applications: This study can provide basic data to develop an intervention program that can reduce suicide attempt rate by analyzing environmental and health related factors affecting suicide attempts.

Keywords: Air pollution, health behavior, suicide, depression, quality of life.

Introduction

Korea’s suicide rate was 24.3 per 100,000 in 2017\(^{[1]}\) and it is very high compared to 11.58 people per 100,000 population, which is the average suicide rate in OECD countries in 2015, second only to Lithuania\(^{[2]}\). Suicide is an important indicator of the mental health of the general public and plays an important role in identifying the weaknesses of the nation’s mental health system.

Suicide is caused by multiple causes, including various physical, mental, and sociocultural factors. Recently, some studies on environmental factors related to suicide-related behaviors were conducted\(^{[3]}\). Among the various air pollution materials, ultrafine particle, due to its small size, affects the central nervous system and induces an inflammatory reaction, which is considered to be highly likely to have a neurobehavioral effect\(^{[3]}\). In addition, when the concentration of fine particle PM10 increased by 1 \( \mu g/m^3 \), the probability of death due to suicide was significantly increased by 1.008 times compared to the probability of death by other factors\(^{[4]}\), and from 2002 to 2013, in the results of a long-term follow-up study of the National Health Insurance Corporation sample cohort data, the risk of suicide by region increased over a long period of air pollution exposure as suicide increased more than 4
times according to air pollution in the highest level (4th quartile) from the lowest level (1st quartile)[5]. Therefore, it is necessary to study how environmental factors such as air pollution are related to suicide attempts.

Other health behavior factors such as health-related quality of life, perceived stress, depression, and drinking have been reported to be related[6-9]. It has been reported that the risk of suicidal thought is low when health-related quality of life is good[6]. Depression is reported as the riskiest factor among suicide-related behaviors[7-8]. In addition, studies on the relationship between environmental factors and suicide attempts among suicide-related factors have not been conducted. In recent years, the global environmental pollution problem has become serious and the damage to the health is expected, but the result is difficult to predict. Therefore, research on the relevance of health effects such as suicidal behavior of environmental factors is needed. Therefore, by analyzing the relevant data on the fine particle concentration by region of the Ministry of Environment and data from 2016 to 2017 out of the 7th National Health and Nutrition Examination Survey, the aim is to determine the effect of fine particle concentration by region and health behavior on suicide attempts.

Method

Subjects: This study used the 7th (2016-2017) primitive data disclosed by National Health and Nutrition Examination Survey[9] and the annual air pollution level provided by the Ministry of Environment[10]. The National Health and Nutrition Examination Survey used a two-stage stratified cluster sampling method, with each sample’s enumeration district and household as primary and secondary sampling[9]. In this study, a total of 16,277 people aged 19 and over were the final subjects for this study.

Instruments:

Suicidal attempt: The suicide attempt was determined by whether or not a suicide attempt was made in the last year[9].

Regional exposure to air pollution: For the fine particle exposure, the average PM10 (fine particle) concentration data of the year was used for the annual air pollution level of the Air Korea’s annual report[10] on air quality for the subject’s residence area. In this study, the PM10 4th quartile of the year was calculated and analyzed.

Health behavior: Health behavior was measured by health-related quality of life, depression diagnosis, perceived stress, and amount of drinking. Health-related quality of life was measured by EQ-5D is calculated by multiplying each score in five dimensions by weight value, and closer to 1, the higher the health-related quality of life[9]. Perceived stress is the stress perception rate, and the numerator were the number of respondents who felt stress “less” or “strongly” during their daily life[9]. Depression diagnosis was measured by whether or not a depression was diagnosed[9]. The amount of drinking was the average amount of alcohol consumed when drinking[9].

Data collection: This data was surveyed from January to December 2016-2017[9] and annual air pollution level change measurement data by region provided by the Ministry of Environment[10].

Ethical consideration: As of 2015, the National Health and Nutrition Examination Survey conducted the research conducted by the state for public welfare without being reviewed by the Research Ethics Review Committee in accordance with the Bioethics Act and Enforcement Rules[9].

Data analysis: In order to establish the representativeness of the sample to the population, the complex sampling method was used by reflecting strata, cluster, and weight in consideration of the sample design characteristics of the data[9]. The data were analyzed using descriptive statistics of the complex sample and logistic regression using the SPSS/WIN 18.0 program.

Result and Discussion

General characteristics of subjects

The suicide attempter’s mean health-related quality of life was 0.81 (±2.69) and the mean health-related quality of life of non-suicide attempter was 0.95 (±0.001), indicating that the suicide attempter had a low health-related quality of life. There was no significant difference in the proportion of suicide attempts according to the 4th quartile of PM10 concentration of fine particle(F=0.36, p=.972). The rate of suicide attempt was significantly
different according to depression diagnosis (F=112.70, \( p<.001 \)), level of perceived stress (F=33.19, \( p<.001 \)), and degree of amount of drinking (F=18.50, \( p=.005 \)). Among the general characteristics, there was a significant difference in the proportion of suicide attempts according to income level (F=42.79, \( p<.001 \)) and economic activity (F=37.94, \( p<.001 \)) [Table 1].

Table 1. General Characteristics and Difference of Suicidal attempt according to Characteristics N = 16,277

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Categories</th>
<th>N</th>
<th>Suicidal attempt % or M±SD</th>
<th>Wald F or Chi-square (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>EQ-5D</td>
<td></td>
<td></td>
<td>46.99±0.28</td>
<td>49.7±2.69</td>
</tr>
<tr>
<td>PM10</td>
<td>1Q</td>
<td>2339</td>
<td>99.4</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>2Q</td>
<td>1968</td>
<td>99.3</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>3Q</td>
<td>4599</td>
<td>99.3</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>4Q</td>
<td>3223</td>
<td>99.3</td>
<td>0.7</td>
</tr>
<tr>
<td>Income</td>
<td>Low</td>
<td>3004</td>
<td>98.5</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Medium low</td>
<td>3039</td>
<td>99.5</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Medium high</td>
<td>3013</td>
<td>99.7</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3034</td>
<td>99.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Economic activity</td>
<td>No</td>
<td>4653</td>
<td>98.7</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>6946</td>
<td>99.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Depression diagnosis</td>
<td>No</td>
<td>11126</td>
<td>99.6</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>521</td>
<td>93.0</td>
<td>7.0</td>
</tr>
<tr>
<td>Perceived stress</td>
<td>Low</td>
<td>8809</td>
<td>99.6</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>3306</td>
<td>98.6</td>
<td>1.4</td>
</tr>
<tr>
<td>Amount of drinking (glasses)</td>
<td>Above 10</td>
<td>1081</td>
<td>98.7</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>7-9</td>
<td>1250</td>
<td>98.7</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>5-6</td>
<td>1272</td>
<td>99.4</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>3-4</td>
<td>1845</td>
<td>99.7</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>1-2</td>
<td>8741</td>
<td>99.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Factors affecting suicidal attempt of subjects:
To identify exposure to fine particle concentrations and health behavior factors affecting suicide attempts, a logistic regression analysis was performed by adjusting the income level and economic activity, which differ in general characteristics. As a result of the analysis, there was no significant difference in suicide attempt according to the 4th quartile of fine particle concentration (PM10). Among health behaviors, factors affecting suicide attempts were depression diagnosis (\( \beta = 2.51, p<.001 \)), health-related quality of life(\( \beta = -2.35, p=.030 \)), amount of drinking (\( \beta = 1.71, p=.002 \)), and perceived stress (\( \beta = 0.91, p=.033 \)). The group diagnosed with depression was 12.32 times more likely (95% CI 5.33-28.49, \( p<.001 \)) to undergo suicide attempt than the group not diagnosed with depression. Compared to the group with low perceived stress, the group with high perceived stress showed 2.48 times more susceptibility (95% CI
In amount of drinking, compared with the group with 1 or 2 drinks, the group with 10 or more drinks was 5.55 times more likely to attempt suicide (95% CI 1.87-16.46, \( p = .002 \)). In health-related quality of life (\( \beta = -2.35, \ p = .030 \)), a 0.1-unit increase equated to 0.79 times the suicide attempt rate. In other words, the suicide attempt rate increased by 1.11 times as the health-related quality of life decreased by 0.1 units [Table 2].

### Table 2. Factors affecting suicidal attempt

<table>
<thead>
<tr>
<th>Variables</th>
<th>Parameter estimate</th>
<th>OR</th>
<th>95% CI</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-6.18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PM10 (4Q)</td>
<td>-.26</td>
<td>0.76</td>
<td>0.25-2.33</td>
<td>.640</td>
</tr>
<tr>
<td>PM10 (3Q)</td>
<td>.72</td>
<td>2.07</td>
<td>0.77-5.55</td>
<td>.147</td>
</tr>
<tr>
<td>PM10 (2Q)</td>
<td>-.12</td>
<td>0.88</td>
<td>0.20-3.74</td>
<td>.862</td>
</tr>
<tr>
<td>PM10 (1Q)</td>
<td>Ref</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression diagnosis (yes)</td>
<td>2.51</td>
<td>12.32</td>
<td>5.33-28.49</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Depression diagnosis (no)</td>
<td>Ref</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived stress (high)</td>
<td>.911</td>
<td>2.48</td>
<td>1.07-5.73</td>
<td>.033</td>
</tr>
<tr>
<td>Perceived stress (low)</td>
<td>Ref</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amount of drinking (Above 10)</td>
<td>1.71</td>
<td>5.55</td>
<td>1.87-16.46</td>
<td>.002</td>
</tr>
<tr>
<td>Amount of drinking (7-9)</td>
<td>1.07</td>
<td>2.92</td>
<td>0.94-9.08</td>
<td>.064</td>
</tr>
<tr>
<td>Amount of drinking (5-6)</td>
<td>0.42</td>
<td>1.52</td>
<td>0.36-6.32</td>
<td>.558</td>
</tr>
<tr>
<td>Amount of drinking (3-4)</td>
<td>-0.10</td>
<td>0.90</td>
<td>0.27-2.99</td>
<td>.864</td>
</tr>
<tr>
<td>Amount of drinking (1-2)</td>
<td>Ref</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health-related Quality of life (EQ-5D)</td>
<td>-2.35</td>
<td>0.79</td>
<td>0.63-0.97</td>
<td>.030</td>
</tr>
<tr>
<td>Income (low)</td>
<td>1.11</td>
<td>3.03</td>
<td>1.11-8.27</td>
<td>.030</td>
</tr>
<tr>
<td>Income (medium low)</td>
<td>.14</td>
<td>1.15</td>
<td>0.36-3.68</td>
<td>.81</td>
</tr>
<tr>
<td>Income (medium high)</td>
<td>-.02</td>
<td>0.97</td>
<td>0.23-4.08</td>
<td>.97</td>
</tr>
<tr>
<td>Income (high)</td>
<td>Ref</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic activity (no)</td>
<td>1.52</td>
<td>4.61</td>
<td>1.92-11.04</td>
<td>.001</td>
</tr>
<tr>
<td>Economic activity (yes)</td>
<td>Ref</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Discussion**

In this study, to determine whether air pollution and health behavior affect suicide attempts, the National Health and Nutrition Examination Survey and the Ministry of Environment’s atmospheric environment concentration data were used. In Korea, a policy is in place to establish a national suicide prevention action plan since 2018, to eliminate suicide risk through active intervention and management of suicide, and reduce the suicide rate to 17 by 2022\(^{[11]}\). Recently, on the basis of the results that systemic inflammatory marker (C-reactive protein) has been changed due to environmental pollution, that this is related to suicide risk\(^{[12]}\), and in addition to the existing biological and socio-cultural causes, the relationship with environmental pollution as a cause of suicide has been raised. As a result of designing and analyzing the study based on the results of these previous studies, it was found in this study that it does not affect the suicide attempt according to the annual PM10 concentration exposure by region. This is similar to the result that there was no association between PM2.5 and 29,939 suicides in Japan\(^{[13]}\). However, this is contrary...
to the result that there is a correlation between suicide mortality rate and 5 pollutant concentrations during the week, and a reported result of a 3.2% increase in suicide mortality according to weekly PM10 concentration\(^{[14]}\), and the study of suicide deaths in Korea which found that the odds of deaths due to suicide increased 1.008 times as PM 10 concentration increased \(^{[4]}\). In this study, the annual average observed concentration of fine particle concentration by region was applied, and various factors such as temperature that could affect fine particle concentration were not considered. Therefore, in the next study, it is necessary to make a model for predicting the atmospheric environment for pollutant concentration.

In this study, the factor that had the greatest influence on suicide attempts after adjusting income and economic activity was depression. Post-mortem investigations showed that almost all suicide attempters had mental health problems and high levels of depression\(^{[15]}\). In a study in Taiwan, the risk of suicidal thought was 15.5 times higher compared to the group without depression\(^{[7]}\). In this study, the group diagnosed with depression was 12.32 times higher in suicide attempt than the group not diagnosed with depression, which is similar to the results of the previous studies.

The second influencing factor was amount of drinking. In the risk factor analysis of suicide attempters, drinking status was 51.5% during suicide attempt, and drinking was found to be a risk factor affecting suicide attempts\(^{[17]}\). In this study, people with a large amount of drinking were 5.55 times higher than those with a small amount of drinking\(^{[17]}\). In a drinking state, it makes it difficult to control the negative emotions of people who have thoughts of suicide, and the ability to judge is also reduced by paralyzing rational thinking. This condition can easily lead to suicide attempts or suicide\(^{[17]}\).

The third influencing factor was perceived stress. Stress is shown to be a major influencing factor in suicide related behavior \(^{[7, 17]}\). In this study, it was found that a person with a lot of stress is 2.48 times more likely to attempt suicide, and it is similar to the result that stress is a major influencing factor of suicide related behavior\(^{[7]}\), or the result that a person who has a lot of stress thinks suicide 3.5 times more than a person who feels less stress\(^{[17]}\). People with suicide attempt experiences can lead to suicide related behaviors due to inability to address stress well.

The fourth influencing factor was health related quality of life. The health-related quality of life was 0.95 for those who did not attempt suicide, similar to the results for men and women in their 40s, which was 0.95 and 0.92 for 50s \(^{[18]}\), but suicide attempters were as low as average 0.81. This is because health-related quality of life is negatively correlated with suicidal thoughts \(^{[19]}\) and when health-related quality of life is low, suicidal thoughts are 2.5 times \(^{[17]}\) higher than in the high health-related quality of life group.

As a result of this study, air pollution concentration exposure level, which is an environmental factor among the risk factors of suicide attempt, did not appear as an influencing factor of suicide attempts. There should be contributions to reducing suicide attempts by mediating depression, amount of drinking, perceived stress, and health related quality of life which were found to be health behavior related factors affecting suicide attempts.

**Conclusion**

Factors influencing suicide attempts were depression, amount of drinking, perceived stress, and health related quality of life. Therefore, a program to mediate these factors should be developed and applied, and repetitive studies should be attempted to confirm the impact of environmental factors on suicide attempts. Therefore, in order to investigate the short-term and long-term effects of air pollution on suicide-related behaviors, a predictive modelling research on air pollution exposure should be conducted, and corresponding research on risk factors should be conducted.

**Ethical Clearance:** Not required

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**Conflict of Interest:** Nil

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Tuberculosis in Baghdad, Iraq 2012-2016: Retrospective Study

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Abstract

Objective(s): The present study intended at examining the prevalence of tuberculosis in Baghdad City, Iraq for the period of 2012-2016.

Methodology: A descriptive “retrospective” design was applied throughout the present study from the period of November 12th 2017 to February 13th 2018 in order to detect the tuberculosis cases with regard to patients’ demographic characteristics in Baghdad City, Iraq for 2012-2016. A total of (11680) registered patients with tuberculosis are selected. An instrument was constructed for the purpose of the study. Data were collected from the health records at the National Tuberculosis Center, State TB center, and district TB center for the period of 2012 to 2016 with the use of the study instrument. Data were analyzed through the application of descriptive statistical data analysis approach of frequency, percent and total scores.

Results: The study findings revealed that there was a significant difference among them pairwise from this point of view; i.e., the number of married people is more than single, more than divorced and more than a patient with a dead spouse the literacy level of TB patients is significantly different, with (59.77%) of illiterate patients, (2.27%) of elementary education, (18.30%) of secondary education, (19.04%) of secondary education and diploma and (0.61%) university degree. Most of the patients had experienced Extra-pulmonary Tuberculosis (52.36%).

Conclusion: The study concluded that the gender ratio was accounted for the most (2.14:1) in the year of 2015. The urban zone the incidence rate was greater than that of the rural zone.

Keyword: Tuberculosis, retrospective study, prevalence, Baghdad City, Iraq.

Introduction

Tuberculosis, or TB, is a bacterial infection that can spread through the air. It is most often found in the lungs, but can exist in any organ in your body. When a person coughs or sneezes, they can transmit so-called “active” TB. However, many people are also infected with an inactive form of TB, known as latent TB. The bacillus that causes the disease is called Mycobacterium tuberculosis (M.tb). M.tb’s unique cell wall, which has a waxy coating primarily composed of mycolic acids, allows the bacillus to lie dormant for many years. The body’s immune system may restrain the disease, but it does not destroy it. While some people with this latent infection will never develop active TB, five to ten percent of carriers will become sick in their lifetime(1).

The incidence of TB varies with age. In Africa, TB primarily affects adolescents and young adults (WHO, 2011a). However, in countries where TB has gone from high to low incidence, such as the United States, TB is mainly a disease of older people, or of the immunocompromised(2,3).

The limited availability of data on health status is a major constraint in assessing the health situation in developing countries. Surveillance data are lacking for many major public health concerns. Estimates of prevalence and incidence are available for some diseases but are often unreliable and incomplete. National health authorities differ widely in capacity and willingness to collect or report information. To compensate for this and improve reliability and international comparability, the
World Health Organization (WHO) prepares estimates in accordance with epidemiological models and statistical standards\(^{(4-12)}\).

Based on the early stated facts, the present study ought to carry out a retrospective study to investigate the detected cases of tuberculosis in Baghdad, Iraq for 2012-2016 with respect to its demography.

**Method**

A descriptive “retrospective” design was employed throughout the present study from the period of November 12\(^{th}\) 2017 to February 13\(^{th}\) 2018 in order to detect the tuberculosis cases in Baghdad City, Iraq for 2012-2016. A convenient sample of (11680) registered patients with tuberculosis in Baghdad, Iraq for the period of 2012-2016. These patients were males and females and they were one year to over than 65 year of age. An instrument was constructed for the purpose of the study. It is comprised of items that focused on patients’ characteristics of age, gender and type of Tuberculosis. A pilot study was conducted for the determination of the study instrument’s content validity, internal consistency reliability and adequacy. The study was carried out for the period of December 10\(^{th}\) -20\(^{th}\) 2017. Content validity of the instrument was determined through panel of (15) experts. These experts were (5) faculty members at the College of Nursing University of Baghdad, (5) Faculty members at the College of Medicine University of Baghdad and (5) epidemiologists at the Ministry of Health and Environment. They were presented with copy of the study instrument and asked to review it and provide comments for its modification to be more appropriate measure of the study. They had reviewed the instrument and presented their comments with an agreement that the instrument is content valid. Internal consistency reliability was determined for the study instrument through the use of split-half technique and measurement of Cronbach alpha correlation coefficient. The result indicated that Cronbach alpha correlation coefficient was $r=0.85$ which adequately reliable measure for the problem underlying the present study. Data were collected from the health records at the National Tuberculosis Center, State TB center, and district TB center for the period of 2012 to 2016 with the use of the study instrument. Data were analyzed through the application of descriptive statistical data analysis approach of frequency, percent and total scores.

**Results**

Table 1a presents that female patients were slightly larger than male ones. Relative to the living place, this table depicts that patients living in the urban area were accounted for the most (91.85%) (Table 1b).

The results in the Table 1c reveal that 41.92%, 18.53%, 31.05% and 8.50% of the patients were married, single, divorced and patients with deceased spouses, and there was a significant difference among them pairwise from this point of view; i.e., the number of married people is more than single, more than divorced and more than a patient with a dead spouse.

The data show that the literacy level of TB patients is significantly different, with 59.77% of illiterate patients, 2.27% of elementary education, 18.30% of secondary education, 19.04% of secondary education and diploma and 0.61% university degree (Table 1d).

Table 1e indicates that most of the patients had experienced Extra-pulmonary Tuberculosis (52.36%).

Table (2) reveals that reported incidence rate of TB cases according to the geographically in Baghdad during 2012-2016. The rural area incidence rate was 66/100,000 per year and Urban area 166/100,000 per year. The incidence rate of rural area was almost same since 2012 to 2016. Among the urban zone the incidence rate was slightly decreasing during 2012- 2016.

**Conclusion**

Based on the interpretation of the study findings, the study can conclude that:

1. Female patients were slightly larger than male ones.
2. Most of the patients were married, urban area residents, illiterate and having Extra Pulmonary Tuberculosis.
3. The gender ratio was accounted for the most (2.14:1) in the year of 2015.
4. The urban zone the incidence rate was greater than that of the rural zone.
Recommendations:

Based on the early stated conclusion, the present study can recommend that:

1. Patients who were young males and females, married, illiterates and urban area residents can be provided with all means of treatment and preventive measures.

2. Further research with a large sample size and wide range of variables can be conducted.

Table (1). Distribution of Demographic Characteristics of Tuberculosis Patients Referred to Baghdad Health Centers

<table>
<thead>
<tr>
<th>Demographic Characteristic</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>5747</td>
<td>49.5</td>
</tr>
<tr>
<td>Female</td>
<td>5933</td>
<td>50.5</td>
</tr>
<tr>
<td>Living place</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>10729</td>
<td>91.85</td>
</tr>
<tr>
<td>Rural</td>
<td>951</td>
<td>8.15</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>4897</td>
<td>41.92</td>
</tr>
<tr>
<td>Single</td>
<td>2165</td>
<td>18.53</td>
</tr>
<tr>
<td>Divorced</td>
<td>3627</td>
<td>31.05</td>
</tr>
<tr>
<td>Other</td>
<td>991</td>
<td>8.50</td>
</tr>
<tr>
<td>Total</td>
<td>11680</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>6980</td>
<td>59.77</td>
</tr>
<tr>
<td>Primary</td>
<td>266</td>
<td>2.27</td>
</tr>
<tr>
<td>Secondary</td>
<td>2137</td>
<td>18.30</td>
</tr>
<tr>
<td>Diploma</td>
<td>2225</td>
<td>19.04</td>
</tr>
<tr>
<td>University</td>
<td>72</td>
<td>0.61</td>
</tr>
<tr>
<td>Total</td>
<td>11680</td>
<td></td>
</tr>
<tr>
<td>TB type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exta-pulmonary TB</td>
<td>4539</td>
<td>52.36</td>
</tr>
<tr>
<td>Pulmonary TB</td>
<td>4129</td>
<td>47.64</td>
</tr>
</tbody>
</table>

Table (2). IR or TB in Iraq Baghdad during (2012-2016) by Urban and Rural Areas

<table>
<thead>
<tr>
<th>Years</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>619</td>
<td>1649</td>
</tr>
<tr>
<td>2013</td>
<td>631</td>
<td>1576</td>
</tr>
<tr>
<td>2014</td>
<td>671</td>
<td>1708</td>
</tr>
<tr>
<td>2015</td>
<td>712</td>
<td>1860</td>
</tr>
<tr>
<td>2016</td>
<td>699</td>
<td>1555</td>
</tr>
</tbody>
</table>

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

References


Immediate Induction of Labour Versus Expectant Management (Waiting for 24 Hours Before Induction) For prelabour Rupture of Membranes at Term

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Abstract

Background: Prelabour rupture of membrane occur when membrane ruptured without contractions in term pregnancy.

Objectives: To assess the effects of expectant management versus induction of labour in term prelabour rupture of membranes on maternal and fetal wellbeing.

Method: This study is carried out in kerbala maternity hospital from October 2018 till December 2019. (139) patients with rupture of membrane at term in latent phase of first stage of labor. These patient were divided into 2 groups; first group (62 pregnant) which was expectant management for 24 hours and a second group (77 pregnant) which was managed by active induction of labour by using either oxytocin infusion or prostaglandienes depending on Bi-Shop score of the cervix.

Results: 139 pregnant 50 (35.97%) primigravida and 89(64.03%) had at least one previous vaginal delivery. Term with membrane rupture and no uterine contractions. 77(55.4%) start active management of labor with either prostaglandins or oxytocin depending on Bi-shop score of the cervix and 66 (44.6%) start conservative management. Caesarean section was carried out in 24 (17.3%) of the female mostly due to fetal distress and arrest of cervical dilatation. Vaginal delivery occur in 115 (82.7%) . The active management group (19.48%) delivered by caesarean section and (80.52%) delivered vaginally. While the group that managed conservatively (14.52%) delivered by caesarean section and (85.48%) delivered vaginally and the P-value between both groups are not significant (0.593).Regarding the duration of labour we found that expectant management had a mean duration of labour of about 8 hours which is shorter than the mean duration of labour of active management which is 10 hour, but the P-value is statistically not significant (0.440). There are no maternal complications in the two groups of pregnant female, but there is one intrapartum fetal death with active management plane but the difference was statistically not significant. (P-value 0.811).

Conclusion: Conservative or active management of labour are effective as a treatment for term prelabour rupture of membrane, but active management of labour need close monitoring and associate with more complications.

Keyword: Prelabour rupture of membrane, expectant management of labour, active management of labour.

Introduction

Prelabour rupture of membrane occurs in about 10% of all pregnancies, 80% of them occur in term pregnancies.¹ Rupture of membrane occur due to many causes such as over distended uterus (polyhydramnio, twin pregnancy or uterine fibroid), congenital uterine anomaly or cervical incompetence, inflammatory process due to cervicitis or amnionitis or due to smoking and nutritional deficiencies.² Complications of prelabour rupture of membrane include cord prolapsed, cord compression, placental abruption, maternal and neonatal infection and increase incidence of caesarean...
section and operative vaginal delivery\(^2\). Pregnant women with term pregnancy and rupture of membrane without contractions had 2 main management options; conservative management in which we can wait for 24-48 hr with the hope of starting spontaneous contractions and labor (mimic the spontaneous labor) which may cause chorioamnionitis, prolonged labor and active management in which we can initiate the contractions by using prostaglandins or oxytocin infusion to shorten the duration of labor and lower incidence of infection but increase the incidence of fetal distress and caesarean section. \(^3\)\(^4\) Prostaglandin E1 analogue (Misoprostol) can be used for induction of labour as an oral tablet, sublingual, vaginal or rectal which can cause uterine contractions and cervical ripening and is a drug of choice for induction of labour because it is cheap, easily to be administer and no need special temperature for it is use.\(^5\)\(^6\)\(^7\) The recommended dose of oral misoprostol for induction of labour between 50-100 micrograme can be repeated every 4 hours.\(^8\)

**Materials and Method**

139 pregnant female included in the study, who are attained Karbala maternity hospital from October 2018 till December 2019. All these women are in latent phase of first stage of labour (cervical dilatation ≤ 4 cm). Inclusion criteria: Single cephalic presented fetus, Term (37-41 weeks) gestation and had spontaneous rupture of membrane without abdominal pain. Exclusion criteria; Previous caesarean section, Fetal macrosomia, Preterm pregnancy, Signs and symptoms of chorioamnionitis, Signs and symptoms of fetal distress (decrease movement, abnormal Doppler, meconium stained liquir), Maternal medical disease (hypertension, diabetes.), Malpresented fetus, Women in active labour and any contra indications for induction of labour such as placenta praeavla. History taken from these female and general abdominal examination (presentation, contraction, fetal heart rate). Pelvic examination confirmation of rupture of membrane and assessment of cervical dilatation was done. After that these female divided into 2 groups. First group was conservative management (for 24 to 48 hours) and the second group were actively management (induction of labor by prostaglandins or oxytocin depending on Bishop score of the cervix). Women are followed during the whole period of their hospital stay (duration of hospital stay, mode of delivery, route of delivery, maternal and neonatal complications), both groups receive prophylactic antibiotics (oral amoxicillin). Caesarean section was indicated for fetal distress, arrest of cervical dilatation or descend of fetus. After delivery neonates were monitored for early signs of infection or neonatal care unite admission and the females were monitored for any signs of endometritis or bleeding that necessitate blood transfusion.

**Results**

139 pregnant female were included in this study, 50 female (35.97%) were primigravida and 89(64.03%) had at least one previous vaginal delivery. They were term pregnancy between 37 weeks to 41 weeks (mean 39.37). Duration of membrane rupture prior to admission was between one to 24 hours prior to admission with average about 4.67 hours. All female was in latent phase with cervical dilatation of (1–4) centimeter with average 3 centimeter. 77 of these female (55.4%) start active management of labor with either prostaglandins or oxytocin depending on Bi-shop score of the cervix and 66 female (44.6%) start conservative management. Rupture of membrane to delivery time was calculated between 1 to 48 hours with mean of 9.34 hours. Caesarean section was carried out in 24 (17.3%) of the female mostly due to fetal distress and arrest of cervical dilatation. Vaginal delivery occur in 115 (82.7%). No maternal complications were occur in both groups, But there is one intrapartum fetal death in the active management group. Mean hospital stay was about 12.19 hours (2-52 hours) as shown in table (1).

**Table (1): Characteristics of female in the study**

<table>
<thead>
<tr>
<th>Parity</th>
<th>Primigravida 50</th>
<th>Previous delivery 89</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weeks of gestation</td>
<td>(37-41)</td>
<td>Mean 39.37</td>
</tr>
<tr>
<td>Duration of membrane rupture (hr.)</td>
<td>Mean 4.67</td>
<td></td>
</tr>
<tr>
<td>Dilatation of the cervix (cm)</td>
<td>(1-4)</td>
<td>Mean 3</td>
</tr>
<tr>
<td>Management plane</td>
<td>Active 77</td>
<td>55.4%</td>
</tr>
<tr>
<td></td>
<td>Expectant 62</td>
<td>44.6%</td>
</tr>
</tbody>
</table>
# Table (2): The relationship between management plane and the mode of delivery

<table>
<thead>
<tr>
<th>Mode of delivery</th>
<th>Management</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Active</td>
<td>Expectant</td>
</tr>
<tr>
<td>Caesarean section</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>Vaginal delivery</td>
<td>62</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>77</td>
<td>62</td>
</tr>
</tbody>
</table>

Table (2) showed that of the total 139 cases, 77 female had active management (15 female delivered by caesarean section and 62 delivered by vaginal delivery) and the second group 62 female had expectant management (9 of them delivered by emergency caesarean section and 53 delivered vaginally).

# Table (3): The relation between percentage of cases delivered vaginally and caesarean section between the groups of patients and their statistical significant

<table>
<thead>
<tr>
<th>Management</th>
<th>Mode of delivery</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Caesarean section</td>
<td>Vaginal delivery</td>
</tr>
<tr>
<td>Active</td>
<td>19.48%</td>
<td>80.52%</td>
</tr>
<tr>
<td>Expectant</td>
<td>14.52%</td>
<td>85.48%</td>
</tr>
</tbody>
</table>

*Byperson chi-square

# Table (4): Relationship between mean duration of labour and management plane of labour

<table>
<thead>
<tr>
<th>Management plane</th>
<th>Mean duration of labour</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>10 hr</td>
<td></td>
</tr>
<tr>
<td>Expectant</td>
<td>8 hr</td>
<td>0.440</td>
</tr>
</tbody>
</table>

Table (3) showed that 19.48% of female with active management delivered by caesarean section compared to 14.52% of patients with expectant management that need immediate caesarean section. 80.52% of pregnant female delivered vaginally with active management compared to 85.48% of pregnant female with expectant management, but the P-value was 0.593 which is statistically not significant.

Table (4) showed the relationship between mean duration of labour and management plane of labour, which showed that expectant management had a mean duration of labour of about 8 hours which is shorter than the mean duration of labour of active management which is 10 hour, but the P-value is statistically not significant (0.440).

Table (5) shows the relationship between maternal active (-), expectant (-), P-value () and fetal complications active (1 dead baby (0.7%), expectant (-), P-value (0.811) . There are no maternal complications in the two groups of pregnant female, but there is one intrapartum fetal death with active management plane but the difference was statistically not significant. (P-value 0.811)

**Discussion:** Management options for prelabour rupture of membrane at term are either conservative or active induction of labour. Induction of labour is the most option applied nowadays because of maternal preference this modality of management(9), but induction of labour need close monitoring of uterine contractions and fetal heart rate as it may cause hypertonus uterine contractions, fetal distress, fetal death and rupture uterus. Most female with prelabour rupture of membrane can delivered spontaneously if managed conservatively 24-48 hr in 75-80% of these female(10). In our study we found that both planes of management (expectant or active by induction of labour) had no statistically significance difference regarding maternal, fetal complications, mode of delivery and duration of labour in contrast to study done by Jagrati Kiran in 2015 who found that active management of labour is superior to expectant management regarding maternal and neonatal morbidities and mortalities(11) while similar to the result.
of study done by A. Shetty in 2002\(^{16}\) and Shafqat Fatimain 2015 who also found no statistical significant between the two modalities of management\(^{12}\). There is a study done by Shah Krupa in 2012 who found that the period between rupture of membrane to the delivery was significantly lower in active management unlike our result we found that there is no statistically significant between the two groups\(^{13}\). In our study there was no statistically significant in the incidence of caesarean section in both groups (P-value 0.593) in contrast to study done by da Grace Krupa in 2005 which found higher incidence of caesarean section in conservative management group\(^{14}\). In a study done by Mansi in 2017 found higher incidence of fever and wound infection in women treated conservatively (P-value 0.006 for maternal fever and 0.003 for wound infection)which was statistically significant while in our study maternal and fetal complications between the two groups was not significant\(^{15}\).

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

**References**

Effects of E. Coli Infection on Kidney Function Tests in Experimentally Inoculated Rats

Mundher Jabbar Irsan AL_Okhedi¹, Thaar Mohammed Najim², Bahjat Fakhri Mahmood Al-shammari¹, Mustafa Salah Hasan², Marwa Raad Jead⁴


Abstracts

The aim of this study was to evaluate the kidney function tests in rats experimentally infected with E. coli with monitoring signs of UTI. Forty female rats were divided into two groups, infected (20 rats) and control (20 rats). The infected group were inoculated intraurethral by 10⁸ suspension of E. coli. The animals were monitored for presence of signs. E. coli urine bacterial demonstration were done at 1 week before infection and 24hrs., 48hrs, 96hrs, 6 days, 12 days and 24 days after infection. Blood samples were collected at zero, 24hrs, 3 days, 6 days, 14 days and 24 days. Blood samples for serum BUN and creatinine were collected. The findings suggested that the E.coli isolation has been continuous 24 days since experimentation started. After 24 hrs. post infection, infected rats were suffering from UTIs sings, including frequent urination, pain on urination, foul smelling, diarrhea, poor appetite, and fever. Also, the current results showed that at zero time, all rats present normal value of serum urea and creatinine, Post-infection with E. coli, A significant increase in BUN and creatinine was shown by the infected group at 24 hours, 3 days, 6 days, 14 days and 24 days, as opposed to the control group.

In conclusion, E. coli can induce UTI in rats manifested by increase BUN and Creatinine.

Keywords: Rat, BUN, Creatinine, E. coli, Kidney, UTI.

Introduction

Escherichia coli has been implicated to causes disease in human(1) as well as animals (2,3,4,5,6,7,8).

In addition to gastrointestinal effects, it can cause UTI, meningitis in neonates and humans septicemia(9).

The presence of a specific virulence factors, adaptations of the microbial, encouraging urinal tract achievement, distinguishes E.coli which is a source of UTI and another uropathogens from associated memberships of their genus and species(10). Escherichia coli are the most common organism causing Lower (UTI). Although not all strains of E. coli are pathogenic to the urinary tract which suggested that the infective E. coli strains are a selected group with special properties enabling them to survive and multiply in the host tissue(11).

Creatinine is generated as the final result of muscle metabolism, creatinephosphate is excreted primarily by the kidneys and then mostly through glomerular filtration. Blood creatinine assays are most specific clinically important renal function calculation(12).

The Urea of Blood Nitrogen (BUN) is the protein breakdown product cause acute kidney dysfunction and kidney hypoperfusion incidence(13,14).

An experimental infection of EHEC conducted on New Zealand rabbits by(15) they showed an increase in

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BUN level on the eighth day after infection as compared with control group.

Mohawk et al. (16) Managed E. coli O157: H7 was found to have elevated blood urea nitrogen levels in moribund animals, for mice orally.

This study aimed to estimate the kidney function tests in rats experimentally infected with E. coli with monitoring signs of UTI.

**Materials and Method**

Forty female rats were classified into two groups, infected (20 rats) and control (20 rats). The infected group were inoculated intraurethral by $10^8$ suspension of E. coli according to (17).

The animals were monitored for presence of signs. E. coli urinbacterial demonstration were done at 1 week before infection and 24hrs., 48hrs, 96hrs, 6 days, 12 days and 24 days after infection.

Blood samples were collected at zero, 24hrs, 3 days, 6 days, 14 days and 24 days. The blood samples were collected for estimation the serum BUN and creatinine which were done according to manufacturer instructions.

All data were analyzed statistically as described by (18).

**Results and Discussion**

The isolation of the E. coli was continuous for 24 days from starting the experiment, while no bacterial isolation was appeared before infection (Table 1).

<table>
<thead>
<tr>
<th>Period</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 week before infection</td>
<td>-</td>
</tr>
<tr>
<td>24 hrs.</td>
<td>+</td>
</tr>
<tr>
<td>48 hrs.</td>
<td>+</td>
</tr>
<tr>
<td>96hrs.</td>
<td>+</td>
</tr>
<tr>
<td>6days</td>
<td>+</td>
</tr>
<tr>
<td>12 days</td>
<td>+</td>
</tr>
<tr>
<td>24 days</td>
<td>+</td>
</tr>
</tbody>
</table>

These result in agreements with (19,20) who indicated that before the outbreak was triggered there had been a large rise in bacterial counts of infectious groups relative to their bacterial counts.

All rats included in this study had normal yellow urine before the infection was induced, after 24 hrs. post infection, infected rats were suffering from UTIs sings, including frequent urination, pain on urination, foul smelling, diarrhea, poor appetite, and fever.

Infection led to a strong loss-related anorexia body weight in both categories contaminated (21). The renal excretions of arginine vasopressin byendotoxin of E. coli as well as IL-1recovery. Bacterial endotoxin injections or IL-1 can induce fluid intake changes indicating increasing of fluid and water intake (22). The increased consumption of water in an infected group can contribute to body temperature increasing and diarrhea, resulting in loss of fluid as well as dehydration (23). Anorexia occurrence with an infection indicates that anorexia may be an integral part of the process reaction. It seems like the diet, the intake of food might be suppressed when the metabolic rates for each body temperature degree can go up by 10 - 13 percent. Anorexia caused by infections is believed to be the major factor in the negative balance between nitrogen and weight loss of the body (10). This theory has been tested by injection E.coli. Endotoxin bacteria in rodents, culminating in a rise in body temperature and a decrease in the consumption of food (24).

Appetite loss in infected rats is a vital factor for the hosts defence in the deliberate redistribution during infection of nutrients that contribute to “nutritional immunity.” Evidence now shows that suppression of food consumption in both E and fasted rabbits can be due to endogenous cytokines. E.coli and interleukin-1 have been shown to inhibit the consumption of food.

Also, the current results showed that at zero time, all rats present normal value of serum urea and creatinine, Post-infection with E. coli, the infected group displayed a significant increase ($P<0.05$) in BUNas well as creatinine at days 24 hrs, 3 days, 6 days, 14 days and 24 days as relating with control group (Table 2).

BUN’s and creatinin’s increased may be attributable to the consequence of micro-organisms and their toxins on the kidneys, also the results is completely agreed with (25,26,27) have all decided thoroughly to disclose this development. Increased amounts of creatinine and urea for kidney failure, the results of the present research in agreement with (28) who noticed that serum creatinine was higher in contaminated rabbits with pathogenic E. Coli and the animal found in many kidney areas that...
suffered severe destruction. Al-Taae(29) reported a substantial rise (P<0.05) in serum creatinine and urea on day 30 after *E. coli* infection. In comparison with the control group, *E. coli* O157: H7 in rabbits.

<p>| Table (2): BUN and Creatinine concentrations in infected and control groups. |
|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|-------------------------------------------------|</p>
<table>
<thead>
<tr>
<th><strong>Creatinine (mg/dl)</strong></th>
<th><strong>BUN (mg/dl)</strong></th>
<th><strong>Infected group</strong></th>
<th><strong>Control group</strong></th>
<th><strong>Infected group</strong></th>
<th><strong>Control group</strong></th>
<th><strong>Time</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.58±0.03Ab</td>
<td>0.59±0.06Aa</td>
<td>37.23±0.6Ab</td>
<td>38.4±0.29Aa</td>
<td>Zero day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.69±0.01Aa</td>
<td>0.55±0.02Ba</td>
<td>42.66±0.92Aa</td>
<td>36.74±0.52Ba</td>
<td>24hrs</td>
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</tr>
<tr>
<td>0.72±0.05Aa</td>
<td>0.58±0.01Ba</td>
<td>45.78±0.79Aa</td>
<td>39.26±0.17Ba</td>
<td>Day 3rd</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.72±0.02Aa</td>
<td>0.56±0.02Ba</td>
<td>44.6±0.38Aa</td>
<td>36.45±0.81Ba</td>
<td>Day 6th</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.70±0.1Aa</td>
<td>0.58±0.05Ba</td>
<td>45.24±0.41Aa</td>
<td>39.94±0.58Ba</td>
<td>Day 14th</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.68±0.02Aa</td>
<td>0.54±0.04Ba</td>
<td>45.2±0.2Aa</td>
<td>38.82±0.22Ba</td>
<td>Day 24th</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Capital letters denote significant (p<0.05) differences among infected & control

Small letters denote significant (p<0.05) differences among times

In conclusion, *E. coli* can cause signs of UTI manifested by increase in BUN and Creatinine.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

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9. Bélanger L, Garenoux A, Harel J, Boulianne M, Nadeau E, Dozois CM. Escherichia coli from animal reservoirs as a potential source of
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The Effectiveness of Audio-Visual Education on Lactation Management and Chocking in Mother with Baby in Pandemic Time Covid-19

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Abstract

Many mothers with babies who do not give exclusive breastfeeding and do not understand prevention efforts when the baby is choking, so that mothers need to understand lactation management to optimize the purpose of exclusive breastfeeding, and need to equip themselves in preventive management when the baby is choking. The research objective was to determine the effectiveness of lactation management education and management of choking in mothers with babies in East Java Indonesia.

The research method was a pre-experimental pretest-posttest design. The population was all mothers with babies in Kediri City East Java Indonesia. The sample consisted of 30 respondents using the incidental sampling technique. The independent variables were lactation management education and the choking in babies. The dependent variable was Knowledge and Skills. The research instrument used a questionnaire to use google form and Youtube. Data were collected and statistical tests were performed using the Wilcoxon test with α <0.05.

The results showed that most respondents were infants aged 11-15 months (40%), maternal age was 23 years old (30%), had two babies (60%), body weight 10-11 Kg (30%), complete immunization (90%), but 10% of infants are not immunized. All infant respondents receive exclusive breastfeeding and also regularly attend Posyandu. The results of the Wilcoxon statistical test on the knowledge variable obtained a Z value of -4.8 (> 1.96) with a P-value = 0.000 and the choking treatment variable with a Z value of -4.6 (> 1.96) with a P-value = 0.000 which means there is a significant effect of Audio-Visual Education on Lactation Management and Chocking in Mothers with Babies during the Covid-19 Pandemic on the knowledge and improvement of choking management skills in respondents.

Effective education is provided to increase knowledge and skills in the management of choking in infants. Prevention is more important in reducing the morbidity of cases related to nutrition and the incidence of choking in infants.

Keyword: Audio-visual Education, Lactation, Chocking, Mother with baby.

Introduction

Lactation management is an effort or means made to achieve successful breastfeeding. One of the successes of breastfeeding is breastfeeding techniques. Incorrect breastfeeding techniques cause pain and blisters on the nipples because the baby does not feed until the breast areola, if he only feeds on the nipples, the baby will get a little breast milk. After all, the gums do not press on the lactiferous and the mother will feel pain due to blisters on the nipples ¹. Mothers can study lactation management as part of an effort to prepare for labor and breastfeeding so that complications and things that hinder the breastfeeding process can be prevented². A mother after giving birth is obliged or expected to
breastfeed her baby, this is also believed by the existing culture in the community that it is perfect to be a mother if she can conceive, give birth and breastfeed. Obstetricians must take action to safeguard perinatal mental health. The ability to provide support and to protect our breastfeeding mothers becomes extremely difficult where the virus is rampant. Mother’s milk is the best life fluid that is needed by babies. Mother’s milk contains various substances that are important for the growth and development of babies and according to their needs, but not all mothers want to breastfeed their babies for various reasons, for example, fear of fat, busyness, saggy breasts, and so on, some mothers want to breastfeed their babies, but there are many obstacles, usually, breast milk does not want to come out or the production is not smooth. In the Covid-19 pandemic phenomenon that is often found in the community when breastfeeding mothers often have more severe problems due to the mother’s lack of knowledge in proper breastfeeding techniques, this can affect the fulfillment of baby nutrition because they do not get optimal nutrition and can also cause pain, blisters, and redness in the mother because the baby is not feeding using improper technique.

The Pandemic COVID-19 is spreading throughout the world and has increased sharply in the number of infections, the number of pregnant women and children with COVID-19 continues to rise. Maternal age at the time of COVID-19 in Wuhan was between 29-34 years, with clinical manifestations of fever (86%), cough (14%), and shortness of breath (14%) According to a study in Dhaka Bangladesh on 1,667 infants for 12 months, the results showed that exclusive breastfeeding can reduce the risk of death from acute respiratory infections and diarrhea. Providing exclusive breastfeeding for 6 months is recommended by international guidelines which are based on scientific evidence about the benefits of breast milk for babies, mothers, families, and country. Based on the results of research by Susan Narula, (2015) on the Relationship between Knowledge Level and Mother’s Work with the Success of Lactation Techniques in Breastfeeding Mothers, it shows that most (80.4%) breastfeeding mothers fail to perform lactation techniques, (64.7%) breastfeeding mothers have a low level of knowledge and most (80.4%) breastfeeding mothers have jobs. The COVID-19 has ramifications for the delivery of newborn nutrition. The factors that influence the process of breastfeeding mothers with infants aged 0-6 months, it is shown that 47% of mothers show poor breast conditions, 55% of mothers show poor breastfeeding techniques. Based on the results of observations on breastfeeding mothers on February 10, 2020, at Puskesmas Pesantren Kediri City, the results obtained from 10 breastfeeding respondents, 6 respondents were not capable of breastfeeding techniques by 60%, and 2 respondents who were less capable in breastfeeding techniques by 20%, as well as 2 respondents who are capable of breastfeeding techniques by 20%. The results of the pre-study showed that the problems that occurred in breastfeeding mothers were a pain in 40% for 4 respondents, 10% blisters in 1 respondent, and 10% redness in 1 respondent, and without complaint 40% in 4 respondents.

Mothers who have babies aged 0-6 months are obliged to provide exclusive breast milk. Exclusive breast milk is that babies are only given breast milk, without additional fluids such as formula milk, oranges, honey, tea water, water, and without additional solid foods such as bananas. papaya, milk porridge, biscuits, rice porridge, and team. Breastfeeding on time is not enough, not infrequently, failures in breastfeeding, one of which is due to lack of or absolutely no experience and knowledge about how to breastfeed properly. The ability and willingness of a mother to breastfeed are based on a level of knowledge which is a learning process that can produce the expected behavior changes. Giving breast milk alone without any complementary food until the baby is six months old will have tremendous benefits for the development and growth of the baby in addition to increasing the bond of affection between mother and baby. When breastfeeding in public amenities, mothers can wear masks or cloth face coverings to protect themselves, while their infants cannot wear any respiratory protection to avoid direct exposure to the indoor air. The fulfillment of breast milk for infants aged 0-6 months is less effective. This is influenced by the lack of knowledge of mothers in breastfeeding techniques for their babies. Breastfeeding techniques are a way of providing ideal food for the growth and development of the baby, if the mother does not provide proper breastfeeding techniques then the impact on the mother is such as pain, blisters or redness caused by the baby not feeding until the breast areola, while the impact that can occur if babies do not get optimal nutrition from breastfeeding, including the baby’s weight does not increase, and babies often whine because they are not satisfied.

The correct breastfeeding technique is necessary
so that both the baby and the mother feel comfortable and the baby can get the most from breastfeeding. Management of Choking also needs to be properly educated for mothers with babies. Correct breastfeeding techniques can also be useful in reducing infant mortality due to improper breastfeeding positions. Every mother who has a baby needs to know about the correct breastfeeding technique to achieve optimal baby nutrition. Support from nurses and families is very influential in giving breast milk. Nurses can put more emphasis on counseling about correct breastfeeding techniques to prevent common problems that arise such as blisters, pain, and mothers are reluctant to breastfeed because breastmilk does not come out using leaflets and questions and answers so that families and patients can know the importance of breastfeeding in babies.

**Method**

Method were a pre-experimental pretest-posttest design. This research provides visual education through google form and also videos embedded in Youtube by researchers. The questionnaire is also placed on the google form, the assessment uses the Linkert scale. The independent variables of the study were lactation management education and the management of choking babies. The dependent variable of this research is Knowledge and Skills. The study population was all mothers with babies in the Pesantren District of Kediri City. The research sample consisted of 30 respondents. This research uses the incidental sampling technique. Incidental Sampling in the technique of determining the sample based on chance, that is anyone who accidentally meets the researcher can be used as a sample if it is considered that the person who happened to be met is suitable as the data source. How to collect research data using a google form link containing video and uploaded to Youtube. Respondents by accessing Google Form received audio-visual education and were also able to directly evaluate their understanding of lactation management and management of choking in infants. The questionnaire link is given to cadres to be continued and given to mothers with babies. The questionnaire contains videos of lactation management and management of choking infants. The sample size obtained was 30 respondents. This study has a permit from the agency and got an Ethics Clearance. Data were collected and statistical tests were performed using the Wilcoxon test with $\alpha < 0.05$. Ethical Clearance in Chakra Brahmanda Lentera Institute Indonesia with Number 010/09/VII/EC/KEPK/Lemb.Candle/2020.

**Results**

**Table 1. Demographic**

<table>
<thead>
<tr>
<th>Data</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age of babies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5 months</td>
<td>9</td>
<td>30.0</td>
</tr>
<tr>
<td>6-10 months</td>
<td>6</td>
<td>20.0</td>
</tr>
<tr>
<td>11-15 months</td>
<td>12</td>
<td>40.0</td>
</tr>
<tr>
<td>&gt; 15 months</td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td><strong>Age of Mothers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.00</td>
<td>9</td>
<td>30.0</td>
</tr>
<tr>
<td>24.00</td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td>25.00</td>
<td>6</td>
<td>20.0</td>
</tr>
<tr>
<td>28.00</td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td>32.00</td>
<td>6</td>
<td>20.0</td>
</tr>
<tr>
<td>33.00</td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td><strong>Number of Children</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One</td>
<td>12</td>
<td>40.0</td>
</tr>
<tr>
<td>Two</td>
<td>18</td>
<td>60.0</td>
</tr>
<tr>
<td><strong>Infant Weight (Kg)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Kg</td>
<td>6</td>
<td>20.0</td>
</tr>
<tr>
<td>8 Kg</td>
<td>6</td>
<td>20.0</td>
</tr>
<tr>
<td>10 Kg</td>
<td>9</td>
<td>30.0</td>
</tr>
<tr>
<td>11 Kg</td>
<td>9</td>
<td>30.0</td>
</tr>
<tr>
<td><strong>Immunization</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete</td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td>Incomplete</td>
<td>27</td>
<td>90.0</td>
</tr>
<tr>
<td>Exclusive Breastfeeding</td>
<td>30</td>
<td>100.0</td>
</tr>
<tr>
<td>Routine to Posyandu</td>
<td>30</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The results of the study were obtained from 30 respondents of mothers with babies who were respondents during the COVID-19 Pandemic. The results showed that most respondents were infants aged 11-15 months (40%). The results showed that most of the mothers were 23 years old (30%). Most of the respondents had two babies (60%). Respondents Babies weigh at most 10-11 kg (30%). Respondents Babies have the majority have complete immunization (90%), but 10% of infants are not immunized. All infant respondents receive exclusive breastfeeding and also regularly attend Posyandu.
### Table 2. Statistical Test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Before</th>
<th>After</th>
<th>Ranks</th>
<th>Wilcoxon</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X ± SD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shapiro-Wilk</td>
<td></td>
<td>Shapiro-Wilk</td>
</tr>
<tr>
<td>Knowledge of Lactation Management</td>
<td>5.1 ± 0.6</td>
<td>0.000</td>
<td>8.8 ± 0.8</td>
<td>0.001</td>
</tr>
<tr>
<td>Choking Management</td>
<td>4.8 ± 0.6</td>
<td>0.000</td>
<td>6.7 ± 9.4</td>
<td>0.003</td>
</tr>
</tbody>
</table>

Based on the results of the study, it was found that the average knowledge before the Audio-Visual Education on Lactation Management and Choking in Mothers with Babies during the Covid-19 Pandemic, it was 5.1 and after education, it was 8.8. Based on the results of the study, it was found that the average choking treatment before the Audio-Visual Education on Lactation Management and Choking in Mothers with Babies during the Covid-19 Pandemic was 4.8 and after education was 6.7. The results of the normality test using Shapiro-Wilk showed that all data <0.05, which means that all data groups are not normal, so the statistical test is reduced to Wilcoxon. The results of the Wilcoxon statistical test on the knowledge variable obtained a Z value of -4.8 (> 1.96) with P-value = 0.000, which means that there is a significant effect Audio-Visual Education on Lactation Management and Choking Baby Management in Mothers with Babies during the COVID Period 19 towards increasing knowledge of respondents. The results of the Wilcoxon statistical test on the choking management variable obtained a Z value of -4.6 (> 1.96) with P-value = 0.000, which means there is a significant effect Audio-Visual Education on Lactation Management and Choking Baby Management in Mothers with Babies during the COVID Pandemic Period 19 towards the improvement of choking management skills in respondents.

### Discussion

Lactation management is an effort or method made to achieve breastfeeding success. One of the successes of breastfeeding is breastfeeding techniques. Incorrect breastfeeding techniques cause pain and blisters on the nipples because the baby does not feed until the breast areola, if he only feeds on the nipples, the baby will get a little breast milk. After all, the gums do not press on the lactiferous and the mother will feel pain due to blisters on the nipples. Breastfeeding technique is a way that is second to none in providing ideal food for healthy growth and development of infants and has a unique biological and psychological impact on the health of mothers and babies. Breastfeeding techniques are needed so that babies and mothers feel comfortable and that babies can get the most benefit from breastfeeding. The correct technique of breastfeeding is how to give breast milk to the baby with the correct attachment and position of the mother and baby. Breastfeeding is a way that is second to none in providing the ideal food for the growth and development of a healthy baby.

Based on the results of the study, it was found that Audio-Visual Education on Lactation Management and Management of Choking Babies in Mothers with Babies during the Covid-19 Pandemic had an impact on choking management skills in infants. The baby was associated with increased risk of choking and the highest frequency of choking on finger foods occurred in those who were given finger foods the least often15–17. This shows that the education provided can be used as a preventive in management efforts if choking occurs in infants18,19. Based on the results of the study, most of the mothers who had fewer breastfeeding techniques were mothers who did the breastfeeding technique where the steps were partially carried out and some steps were not carried out. The steps that are not taken by the mother are that the baby is not stimulated to open the mouth by touching the cheek with the nipple after the baby is fed, the suction is not released in the right way, namely by inserting the mother’s little finger into the baby’s mouth, after breastfeeding, milk The mother did not remove a little which was then smeared on the nipple and areola, and the mother also did not check the condition of the breast for injuries or cracks after breastfeeding. In breastfeeding techniques with steps that are not taken by the mother, the mother may have become accustomed to not doing it because the breastfeeding time is not right, and the baby often cries20,21,30,31,22–29. The steps taken in part are that the mother does not wash her hands before the act of breastfeeding, the mother does not sit or lie...
Sufficient breastfeeding technique for mothers is mothers who do the technique with the right steps, and do the technique with partial steps, where the steps are taken correctly are the mother washing her hands before feeding, the mother looking at the baby with great affection, after the baby opens his mouth, quickly the mother brings the breast closer and most of the serial enters the baby’s mouth, the baby is slung in the right way, that is, the baby is held upright against the mother’s shoulder then the mother gently pats the baby’s back. However, it was also found that several techniques were not used, namely, the mother did not stimulate the baby to open his mouth when he was going to be breastfed, the mother did not release the baby’s suction with her little finger after breastfeeding, and the mother did not check the condition of the breast after breastfeeding. This can be proven in terms of the existing phenomena or problems if the respondent has problems with pain and blisters. After all, the baby does not breastfeed until the breast is acerola, if he only feeds on the nipple then the baby will get a little breast milk because the gums do not press on the lactiferous and the mother will feel pain due to blisters on the nipple. Insufficient breastfeeding techniques, the results show that working mothers do breastfeeding techniques in the right steps, it does not rule out that working mothers will affect the time of breastfeeding given to babies, a work schedule that cannot be controlled by the respondent. There are several views from experts on the family. A family consisting of individuals who are joined together by the bonds of marriage, blood, adoption, and live in the same household. While on the other hand, the family is defined as a part of a society whose role is very important to form a healthy culture. In the research results, it was found that most of the breastfeeding techniques lived together with husband and family so that living together in one house with the husband and the respondent’s family would feel psychologically supported to help and support in the act of breastfeeding so that the respondent had sufficient knowledge about the position of breastfeeding, adequate nutritional status, how to stimulate breast milk and care for breasts, so that respondents have confidence, are relaxed in breastfeeding and are not stressed. Family social support provides physical and psychological comfort, reducing the tendency for events that can cause stress.
Conclusion

Based on the results of the study, it was found that the mean of knowledge before the Audio-Visual Education on Lactation Management and Management of Choking Babies in Mothers with Babies during the Covid-19 Pandemic which means that there is a significant effect Audio-Visual Education on Lactation Management and Choking Baby Management in Mothers with Babies during the COVID-Pandemic Period 19 towards increasing knowledge of respondents. The results of the Wilcoxon statistical test on the choking management variable which means there is a significant effect Audio-Visual Education on Lactation Management and Choking Baby Management in Mothers with Babies during the COVID Pandemic -19 towards the improvement of choking management skills in respondents.

Acknowledgments: We thank the Indonesian Ministry of Science, Research, Technology, and Higher Education (RISTEKDIKTI RI) for the 2019 Research Grant and implementation in 2020. We thank all parties and all the research respondents.

Ethical Clearance: Ethical Clearance has taken form from the Chakra Brahmanda Lentera Institute with letter number 010/25/V/EC/KEPK/Lemb.Candle/2020.

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References


Analysis of Worring among Lecturers of Indonesian Bethel Theology on Covid-19

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Lecturer of STT Bethel Indonesia

Abstract

The purpose of this research is to analyze the worry among the lectures of Bethel Theological Seminary concerning Covid-19. The research is using mixed method, which is combination of both qualitative and quantitative method. It employs both descriptive quantitative and phenomenological investigation approaches. The results of quantitative method is triangulated with the qualitative results. The results show that the lecturers of Bethel Theological Seminary do not worry about Covid-19. However, in the future, they may worry, especially if information concerning Covid-19 is spreading uncontrollably. Therefore, the researcher suggest that the stakeholders filter the information regarding Covid-19, so that it may not raise anxiety among those lecturers.

Keywords: Covid-19, worrying, spreading, anxiety.

Introduction

Beginning in 2020, the world was rocked by the spread of co-19 from Wuhan which infected many people in many countries. Covid-19 is a humanitarian pandemic that has caused many victims to be positively infected. Among those infected, some recovered, but many also died. The pandemic covid-19 issue is an interesting phenomenon that is studied and analyzed. That is what encourages scientists, economic practitioners, leaders in various fields of life, and including the general public to give their views on this virus. His views and analysis cover health, social, economic and even political aspects. Pandemic covid-19 has a significant impact on the conditions of human life in general, including the emergence of anxiety, fear, concern and anxiety which then affects humans both physically and psychologically.

Research results show that computer anxiety impacts on a person’s poor skill, performance, and efficacy in using computers. So the results of previous studies indicate that concerns are strategic issues that need to be addressed immediately. But apparently there is no specific research that addresses the concerns of co-19 in the world of education. Based on the explanation above, it appears that research on STTBI lecturers’ concerns about co-19 is an important thing to do. The research was intended to study and analyze the extent to which the impact of co-19 influenced the concerns of STTBI lecturers. From the results of the aforementioned research, it is expected to be a reference for treatment for lecturers who are worried because of co-19.

Materials and Method

The method used in this research is mixed method or combination research that combines quantitative research method and qualitative research method. Conceptually, anxiety is a universal human experience that impacts on the physical, mental, social and spiritual conditions of humans. Operationally, anxiety is a condition in which a person experiences anxiety, fear, tension, anxiety, anger that affects his whole life. The focus of this research (ie worries) can not only be seen and/or discussed positivistically from the outside, but it also needs to be seen and examined more deeply. In the context of such understanding, combination research is a method that can accommodate these needs.

The combined strategy that will be carried out in this study is concurrent triangulation. In this case, the data generated from quantitative research is triangulated with data generated from qualitative research. When the data
from both studies are well confirmed, the research data can be declared valid. For this reason, it is necessary to explain the specifications of both studies.

Quantitative research method were carried out using a descriptive qualitative approach (1 variable and 1 sample group). The variables studied were worries, while the sample group studied was STTBI lecturers. The number of STTBI lecturers is 60 people. Sampling is done randomly using the help of Nomogram Herry King at an error rate of 0.1 which results in a sample of 30 people.

![Figure 1. Calculation of the Number of Research Samples](image)

Research data is measured on an interval scale, and collected by a questionnaire in the form of a statement with a choice of answers on a Likert scale. The questionnaire was arranged based on 3 indicators: feelings, experience, and fear of impact. The questionnaire was tested for validity and reliability then used to collect data. The collected data were analyzed by descriptive t-test. Qualitative research is used to test natural subjects. In this study, the qualitative research approach used is phenomenology. Researchers become the main instrument in research, and collect data with in-depth interview techniques and Focus Group Discussions. The research informants were taken by purposive technique and followed by snow ball sampling. Data validation was done by triangulation, and analyzed using the Spradley model of taxonomic analysis techniques. The results to be sought in the form of meaning is not just a conclusion. In this case what is being sought is the meaning of the level or hierarchy of STTBI lecturers’ concerns for Covid 19.
Results

Quantitative Research Results:

Instrument Validity and Reliability: This test is a indicator of anxiety. Thus there are 3 test results in accordance with the number of indicators of this study. There are 3 instruments with each instrument having as many as 6, 6, and 4. The following are the results of testing the instruments that have been carried out.

Table 1. Indicator Reliability Test Results

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s Alpha</td>
</tr>
<tr>
<td>.860</td>
</tr>
</tbody>
</table>

The instrument for this indicator has a Cronbach’s Alpha coefficient of 0.860. This value is higher than the value that becomes the reliability standard that is 0.6. Thus, this instrument has good reliability.

Table of Test Results of Indicator Validity 1

<table>
<thead>
<tr>
<th>Item-Total Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale Mean if Item Deleted</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>I1Q1 10.0000</td>
</tr>
<tr>
<td>I1Q2 10.2121</td>
</tr>
<tr>
<td>I1Q3 10.7576</td>
</tr>
<tr>
<td>I1Q4 10.4848</td>
</tr>
<tr>
<td>I1Q5 10.6667</td>
</tr>
<tr>
<td>I1Q6 9.8485</td>
</tr>
</tbody>
</table>

Of the 6 questions in this instrument, all of them had a Corrected Item-Total Correlation coefficient above 0.3. Thus, all question items are valid.

Indicator Reliability Test Results Table 2

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s Alpha</td>
</tr>
<tr>
<td>.793</td>
</tr>
</tbody>
</table>

The instrument for this indicator has a Cronbach’s Alpha coefficient of 0.793. This value is higher than the value that becomes the reliability standard that is 0.6. Thus, this instrument has good reliability.

Validity Test Results Table Indicator 2

<table>
<thead>
<tr>
<th>Item-Total Statistics</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>I2Q1 11.6364</td>
</tr>
<tr>
<td>I2Q2 12.2121</td>
</tr>
<tr>
<td>I2Q3 12.7576</td>
</tr>
<tr>
<td>I2Q4 13.4242</td>
</tr>
<tr>
<td>I2Q5 13.0909</td>
</tr>
<tr>
<td>I2Q6 13.3939</td>
</tr>
</tbody>
</table>
Of the 6 questions in this instrument, 5 of them have Corrected Item-Total Correlation coefficient above 0.3. Thus, the 5 question items are valid. There is only 1 invalid item, item number 1. As such, this item cannot be counted as part of this instrument.

### Indicator Reliability Test Results Table 3

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
<th>Cronbach’s Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.781</td>
<td>4</td>
</tr>
</tbody>
</table>

The instrument for this indicator has a Cronbach’s Alpha coefficient of 0.781. This value is higher than the value that becomes the reliability standard that is 0.6. Thus, this instrument has good reliability.

### Table of Test Results of Indicator Validity 3

<table>
<thead>
<tr>
<th>Item-Total Statistics</th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item-Total Correlation</th>
<th>Cronbach’s Alpha if ItemDeleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>I3Q1</td>
<td>8.7273</td>
<td>2.955</td>
<td>.611</td>
<td>.719</td>
</tr>
<tr>
<td>I3Q2</td>
<td>8.5152</td>
<td>2.820</td>
<td>.657</td>
<td>.695</td>
</tr>
<tr>
<td>I3Q3</td>
<td>8.7273</td>
<td>2.830</td>
<td>.544</td>
<td>.751</td>
</tr>
<tr>
<td>I3Q4</td>
<td>8.9394</td>
<td>2.684</td>
<td>.555</td>
<td>.749</td>
</tr>
</tbody>
</table>

Of the 4 questions in this instrument, all of them had a Corrected Item-Total Correlation coefficient above 0.3. Thus, all question items are valid.

### Description of Worry Variable Data

The values in the anxiety variable are obtained by averaging the values of each instrument on the three research indicators. There are 33 respondents who answered as many as 15 instrument items. In accordance with the instrument that has been developed, the range of lecturers’ anxiety values is from 1 to 4. In fact, the lowest concern that lecturers have is 1, and the highest concern is at the level of 3.47 as shown in the following table.

### Descriptive Statistics Calculation Results Table

<table>
<thead>
<tr>
<th>Descriptive Statistics</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kekuatiran</td>
<td>33</td>
<td>1.00</td>
<td>3.47</td>
<td>2.378</td>
<td>.50295</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>33</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The average lecturer concern is 2.37 in the range 1-4. In this case, on a scale of 1-4, the boundary between worrying and not worrying is at 2.5. Thus, while it can be said that the lecturer is not worried about the existence of Covid-19 because worries are only worth 2.37 (less than 2.5). The distribution of lecturer worries is shown in the following histogram.
Image of Distribution of Lecturers’ Concerns:
Based on the histogram above, it appears that although the average lecturer worries are 2.37, there are quite a number of lecturers who have worries. In this case, as many as 14 lecturers had worries above 2.5. For this reason, the average value (2.37) needs to be tested with one sample t-test.

Uji One Sample t-test:

<table>
<thead>
<tr>
<th>Table of results One Sample t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-Sample Test</td>
</tr>
<tr>
<td>Test Value = 2.5</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>t</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Kekuatiran</td>
</tr>
</tbody>
</table>

Based on the above table, it appears that the difference between lecturer worries (2.37) with limitation worries (2.5) is -0.12 which means lecturer worries are below the limit. Furthermore, the value of t is -1.39 which is accepted at the error level 0.172.

Qualitative Research Results
The concerns of STTBI lecturers on Covid-19 are in varying degrees of severity. However, this research found that there is something that equates one lecturer with another lecturer, namely the mechanism of the anxiety formation itself.

1. In December 2019, the world was shocked by the presence of a new virus, namely covid-19 or corona that occurred in Wuhan, China. At this
stage, lecturers who already know this information feel normal. This happened to all lecturers. There are several reasons they are not worried about this, namely the distance between China and Indonesia which is quite far, and there have been efforts to localize this incident so that it does not spread outside.

2. In January 2020, Covid began to spread outside of China and new cases occurred in other countries. At this stage, the lecturer has begun to be divided in terms of his worries.

3. In March 2020, the first Covid case occurred in Indonesia. At this stage, the gap between lecturers has begun to increase. Some lecturers who were not yet worried, are now starting to have worries. This is indicated by feelings such as panic, confusion, “parno”, and fear. While the lecturers who were still feeling normal, at this stage some began to be vigilant and guarded even though they did not panic.

4. In April 2020, Covid-19 infected students at the Bethel Petamburan Seminary. At this stage, some lecturers who had been panic-d, now become dizzy and stressed. While the lecturers who felt normal were no longer there.

Concrete Triangulation Results: The findings obtained in quantitative research are then triangulated with the findings in qualitative research. The process of matching data produces validated data, and data that is not validated. Validated data alone is the final result of this study.

Concrete Triangulation
Lecturers’ concerns are divided into 4 phases:
- Phase 1 (normal)
- Phase 2 (be on guard, just in case)
- Phase 3 (panic, fear, confusion)
- Phase 4 (stress, dizziness)

On the results of quantitative research, it is known that there is 1 lecturer who is not worried at all (worries of 1). When this was confirmed in qualitative research, there were no lecturers who were not worried at all. So this data is not confirmed. While lecturers who are in the category of not worrying (scores below 2.5) were found to be in the anxiety phase 2 and 3. Furthermore, lecturers who had worries (more than 2.5 worries) were found to be in the worry phase 3 and 4. Nevertheless, it is true that in general lecturers are not worried (as evidenced by the results of quantitative and qualitative research).

Discussion

Worrying is a universal human experience, because it is certain that everyone must have felt anxiety. It is true that the level of concern for each individual is different. Anxiety is very closely related to anxiety. Anxiety according to McCroskey is a feeling that is owned by every individual. He considers that the emergence of anxiety involves negative thoughts and feelings so that the consequences lead to unusual behavior and responses. While T E Foose saw an anxiety relationship with phobias. Such conditions actually want to describe the phenomenon, epidemiology, genetics, neurocircuits, and training of any irregularities, to identify in general and different clusters. Each anxiety instrument is organized cognitively and psychologically to see the reaction it causes.

While in the New Testament, a prominent expression can be seen from the Greek word merimnai, which means “concerned, worried, anxious, and afraid.” If the focus on material concern shows weakness or lack of faith. For this reason, understanding the nature of life that depends on God is far more important in worrying about material things.

Another phrase that is used to describe the attitude of worry is the Greek word daag which, if translated
can be interpreted to be anxious, anxious, afraid, afraid. Referring to various notions of the word “worry” it actually shows clear evidence that humans are limited beings who need help\(^1\). Thus it can be said that someone who is anxious needs help that is able or able to free himself from being worried.

On the other hand, feelings of worry in humans is one proof of the need for a definite guarantee about the survival of his life. The guarantee covers, among other things physical, mental, spiritual and social health. It is believed that with this guarantee the level of anxiety that brings anxiety to a person can be reduced. Regarding anxiety, it is good to pay attention to what is expressed by McCroskey\(^1\) that anxiety is an integral part of worry. Anxiety exists in two things namely, state anxiety and trait anxiety. Anxiety in the category of state anxiety is an experience of anxiety that arises in certain circumstances. So, worrying about the category of state anxiety can occur because there are calamities that threaten humanity such as the corona virus case that is endemic globally.

First, individuals experience stress and illness. One important symptom that is easily identified in someone who is anxious in the severe category is stress\(^1\). Furthermore, according to Rita L. Alkitson et al, stress situations produce emotional reactions ranging from excitement to general emotions of anxiety, fatigue, disappointment, and depression (Hilgard, Atkinson, and Atkinson 1980). It can be ascertained that stress that is not resolved properly will ultimately cause greater pressure on a person and if the condition is getting worse then the next result is the emergence of various diseases.

Second, confusion or apathy. If worries are not managed properly, it will have a wide impact, including causing apathy and depression. In general, apathy is an act of withdrawing from the problem at hand. However, apathy that is not resolved can be fatal because it causes depression. For individuals who are unable to control stress or show powerlessness to solve problems, it will cause apathy\(^1\).

Third, anxiety. Mental health is a condition where there is no psychopathology, such as depression and anxiety. This is shown in the harmonious relationship between feelings of happiness and satisfaction in life, positive individual functions both towards themselves and the environment\(^1\).

Fourth, hopelessness or frustration. Feelings of frustration or hopelessness are responses to disappointment towards the failure to achieve targets or goals. It can also be said that frustration is an unpleasant tension, filled with an increasingly higher level of sense and nerve activity. In an effort to achieve something big, hard efforts were made. Frustration as a sense of disappointment with one’s failure to achieve a desired hope or ideal, or a sense of disappointment because the expectations and results achieved do not have a match\(^1\).

Fifth, kill yourself. A person who experiences prolonged depression can result in self-harming actions namely suicide. Depression is an emotional condition characterized by deep sadness, feelings of insignificance and guilt, withdrawal from others, unable to sleep, loss of appetite, sexual desire, and pleasure from what can be done. For people who can’t stand the pressure, anxiety can cause someone to commit suicide. The results of this study indicate that the concern that exists in STTBI lecturers is still at a low level. If related to the five indications above, lecturers’ concerns only reach the third level, which is anxiety. This is certainly in accordance with the results of quantitative research, namely lecturers do not have significant worries about co-19.

Conclusions

Based on the results of research that has been done, it can be concluded that it is true that the concerns of STTBI lecturers on Covid-19 still exist in the low category, namely anxiety. However, this concern can develop if information about Covid-19 continues to grow, and the lecturer pays attention to that information. This is consistent with the new findings in this study, namely concerns based on historical information.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Obtained from university ethical committee

References


Evaluation of Health Services System Process Based on Island Clusters (Case Study in Tanimbar Island District)

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Abstract

The Cluster Center in the island cluster strategy is a health facility that provides primary and secondary health efforts that oversee several sub-groups and/or satellite groups within an island group. The purpose of this study was to determine the process of the island cluster-based health service system in the Tanimbar Islands Regency. This type of research is qualitative research. There were 8 informants in this study, namely the head of health Office, and 7 Head of Public Health Center in the southern cluster of the Tanimbar Islands. Source of informants determined intentionally (purposive). The results showed that the planning process was still carried out by each health facility that was not following island cluster-based services. The organization is carried out by the head of the Public Health Center by monitoring the implementation including preparation and setting of strategies and evaluating the achievement of targets. The implementation of island cluster-based health services is divided into 2 systems, namely case referral and program referral. In the implementation of health services not yet running optimally. Supervision consists of internal supervision and off-site supervision conducted every three months. The evaluation was carried out to see the problems faced by the Public Health Center to be immediately handled, the evaluation showed several programs had not been implemented 100%.

Keywords: Evaluation, Process, Island Clusters, Health Services, Tanimbar Island.

Introduction

Healthy Indonesia 2025 contains the hope that the community can reach quality health services and obtain health insurance. Quality health services intended here are health services including disaster emergencies, services that meet the needs of the community, and are organized by professional standards and ethics. The achievement of UHC differs from country to country, depending on political will and state financial capacity. The richer the country, the easier the country is to ensure health services for its citizens1.

As an archipelago, there are many islands in the Tanimbar Islands, both inhabited and untouched with a total of 113 (one hundred and thirteen) islands. The Tanimbar Islands Health Service is a regional work unit that is the main health service in the Tanimbar Islands district. In charge of 13 Public Health Centers, 34 Pustu (Supporting Public Health Centers) and 19 Poskesdes (Village Health Post), 2 Public Hospitals, 1 Maternity Hospital, 1 RB, and 3 BP. The total number of employees is 437 spread across the health department, Public Health Center, Pustu, and Poskesdes. Conditions of a very wide range of control and frequent obstacles in service in various fields, more specifically in the health sector, have created a health service system known as the Cluster Island health services.

Looking at the condition of the Tanimbar Islands Regency which is also included in the DTPK BK area (Border Remote Areas and Health Troubled Islands) and bearing in mind the Maluku Governor Regulation on Island Cluster Health Services, West Southeast Maluku Regency Regulation number 9 of 2018 concerning Island...
Cluster-Based Health Services and Technical Guidelines for Maluku Island Group Health Services, the purpose of this study is to find out the process of island cluster-based health service systems in the Tanimbar Islands Regency.

**Material and Method**

The type of research used is qualitative research. There were 8 informants in this study, namely the Head of Health Office, and 7 Public Health Center Heads in the southern cluster of the Tanimbar Islands. Source of informants determined intentionally (purposive). The study was conducted by conducting in-depth interviews with informants with the help of interview guidelines.

**Results**

There are several processes in island group-based health services, including planning, organizing, implementing, monitoring, and evaluating. The following are the results of each research variable in the health service process.

Planning at the Public Health Center is carried out to determine how the service process will be carried out in the future Public Health Center. The following are the results of the interview with the informant about the planning process at the Public Health Center.

“Prepare a work plan and put it into program planning for 1 year and then submit it to the Head of the Public Health Center after it has been approved and submitted to the Health Office. The design is based on the coverage results that were not reached and the problems that occurred in the previous fiscal year were included in the current year’s program plan” (YYH, 39 Years Old).

“If for program planning we sit together (every month) and then each presentation program if there are obstacles or problems then we sit and discuss after that a new plan is made” (SP, 57 Years Old).

“The program manager draws up a plan of proposed activities for each program after that, prepares a plan for implementing activities from the program to the Public Health Center planning team and then consults with the health department for implementation” (VO, 41 Years Old).

Information on the suitability of planning at the Public Health Center with the strategic plan in the health department was obtained from the following informants

“Yes, it was stated in the strategic plan” (JCR, 46 Years Old)

“It is appropriate and stated in the work plan of the health service because if it is not there it will be rejected by the system” (DB, 48 Years Old)

“It’s appropriate, because always consult with the health department” (YYH, 39 Years Old)

Based on the results of the interview with informants, it is known that the planning carried out at the Public Health Center is in accordance with the health department’s strategic plan because in the preparation of the plan it always consults with the health department and all forms of service are contained in the health department’s work plan.

Organizing is done so that every plan that has been made to get arrangements so that it is ready to be implemented to achieve common goals. The results of interviews with informants regarding the organizing process at the Public Health Center are shown in the following excerpt.

“Before starting the program, the head of the Public Health Center gathers program holders to see the preparation and timing of the program. After the program in the field has been completed, a re-evaluation is made of the obstacles in implementing the program.” (LL, 39 Years Old)

“The person in charge of UKM (public health efforts) conduct briefing with program holders before going to the field ...” (VO, 41 Years Old)

“Based on management functions, ranging from planning, implementation to evaluation. The Head of the Public Health Center performs the function of direct control over the implementation of the program.” (SF, 46 Years Old)

Based on the results of interviews with informants about the organization conducted by the Head of the Public Health Center it is known that the head of the Public Health Center always monitors the implementation carried out at the Public Health Center including organizing by looking at the preparation and setting of strategies that will be used before the implementation of health services and re-evaluating after implementation health services to see the extent of achieving targets.
After the planning and organizing are done, then what needs to be done is to realize the plan by implementing or implementing it. Information about island group health services was obtained from the following informants.

“There are 2 systems, case referral and program referral ...” (JCR, 46 Years Old).

“Shortening the range of control in handling health care in the cluster area. The capabilities of health workers in the Public Health Center of the cluster center are the same as those in other Public Health Centers. The island cluster system is quite helpful in handling health problems.” (SOL, 45 Years Old).

“The island cluster is one of the solutions to complete the control range of health services in the Tanimbar Regency, both in terms of funding, logistics, and human resources.” (JK, 45 Years Old).

“The island cluster system has a very good purpose. But in the development of island cluster-based health services, only symbols and extinctions.” (IM, 44 Years Old).

Based on the results of interviews with informants it was noted that the implementation of island group-based health services was carried out with 2 systems namely case referral and program referral, where case referral was intended for those who were sick and then referred to health facilities with higher levels. While the program reference is a report that is carried out in stages. Supervision is one of the most important aspects when it is important to implement island cluster-based health services. Supervision is carried out so that early irregularities can be known so that they can be addressed as soon as possible. The following are the results of interviews with informants regarding the supervision process in the implementation of island group-based health services.

“Supervision is divided into two, namely Public Health Center internal supervision through an internal audit team and off-site supervision every three months by involving internal audit and program holders” (LL, 39 Years Old).

“Supervision every 3 months in the Pustu and also Posyandu independently and integrated with the team related to the performance of services in the pustu. Coordinate with the village head to monitor services in the pustu due to island-based service areas. In the supervision, if there are obstacles in service in the pustu such as lack of medicines or consumables, they will be funded with available funds.” (IL, 43 Years Old).

The interview results show that the supervision process by the health department for each Public Health Center is conducted by SIDAK (inspection) and conducts discussions about the problems being experienced by the Public Health Center, but the implementation of supervision is more often done in cross-sector mini-workshops. Whereas the supervision conducted by the Public Health Center is divided into two types namely internal supervision and off-site supervision which is conducted every three months in collaboration with the village head.

The following are the results of interviews with informants about the evacuation process carried out by the Tanimbar Islands Health Department on the Public Health Center in the southern cluster.

“The evaluation was carried out by first conducting a presentation from the heads of the Public Health Center related to the implementation of activities in the months that have not yet been evaluated, if non-budgetary activities can be completed as soon as possible. and then it is evaluated by telephone for an unreachable Public Health Center and then calls every three months for us to complete and discuss in evaluation meetings.” (JCR, 46 Years Old).

The evaluation process is carried out with a presentation related to the implementation of activities that are already running and for Public Health Centers that cannot be reached by evaluating via telephone. Then the problem is identified and made an effort as soon as possible to resolve the problem, but for problems that can not be solved is postponed for the following year. From the evaluation results, it was found that there are still some programs that are not 100% implemented.

Discussion

Program planning carried out at the Public Health Center is following the strategic plan of the health department and all forms of service are contained in the health service work plan. However, this planning process is not following the planning of the island cluster system where planning should be arranged together through one-door planning so that it can be properly accommodated.

Research conducted by Habibi et al. shows the
results that planning is arranged through the process of identifying problems, determining priority issues and formulating work programs in the P2M program at Tamangapa Public Health Center. Another study conducted by Setiowati and Budiono showed the results that the PMT Recovery program planning activities for toddlers in the work area of the East Tegal Public Health Center went well, there were no obstacles. Planning is considered important because it is the process of determining goals or objectives to be achieved and determining the paths and resources needed to achieve that goal as efficiently and effectively as possible.

The organizing process carried out at the South Cluster Public Health Center in Tanimbar Islands Regency is always monitored. Research conducted by Habibi et al., found that the division of tasks, determination of resources, and arranging workgroups in the Communicable Disease Eradication program at Tamangapa Public Health Center was determined based on the discipline or competency of each health worker. While research conducted by Abdullah et al. shows the results that the organization of workgroups was not arranged according to the SDIDTK activity guidelines, the division of tasks to teachers and cadres was still limited to height and weight measurements, the use of KPSP was still carried out entirely by officers.

Other research conducted by Arifuddinet al shows the results that the organization of Public Health Center employees refers to applicable government laws and regulations. Lembasada Public Health Center in the search for responsibility or authority is still not going well.

This study is in line with the study of Jambormias et al., which shows that the formation and implementation of island-based maternity hospital waiting policies is one form of innovation in an effort to shorten the range of control and affordability of health services for pregnant women. Access to health services for pregnant women will be easier to obtain because it is still in a single unit or group of islands.

Research conducted by Utami et al found that internal control functions in the HIV-STI LKB were carried out by the Head of the Public Health Center and service manager while for external supervision conducted by the Semarang City Health Office was carried out by direct field observation and checking monthly reports from Public Health Centers, hospitals, and NGOs. Research conducted by Habibiet al note that the leadership in conducting supervision is usually only via telephone.

There are several indicators of the health service program in the South Cluster of the Tanimbar Islands Regency Public Health Center which are not optimally realized. For programs that have not been realized, education is carried out by working across sectors and endeavoring to create regulations in the form of regulations or decisions by village heads. In line with the research conducted by Purnomo, the results show that hospitals have not been able to handle emergency cases with 100% live saving as standard.

**Conclusion**

This study concludes that the planning process is still being carried out by each health facility that is not compatible with island cluster-based services. The organization is carried out by the head of the Public Health Center by monitoring the implementation including preparation and setting of strategies and evaluating the achievement of targets. The implementation of island cluster-based health services is divided into 2 systems, namely case referral and program referral. In the implementation of health services not yet running optimally. Supervision consists of internal supervision and off-site supervision conducted every three months. Evaluation is carried out to see the problems faced by the Public Health Center for immediate treatment. Evaluation results show that some programs have not been implemented 100%. Planning should be adjusted to the guidelines for the implementation of island-based health services in order to achieve the desired goals of health services.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Obtained from university ethical committee

**References**


Analysis of Serum Vitamin D and Major Histocompatibility Complex Class I-Related Chain a (Mica) Levels in Patients With Breast Carcinoma

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Abstract

Introduction: Breast carcinoma is the most deadly cancer in women worldwide, with an incidence rate of 26 cases per 100,000 women in Indonesia. Treatment and prognosis is very dependent on the stage of breast carcinoma. Vitamin D can inhibit proliferation and invasive cancer cells, induction of differentiation, apoptosis and promotion of angiogenesis. Major Histocompatibility Complex class I - related chain A (MICA) plays a role in reducing the expression of NKG2D receptors in breast carcinomas so that they can be targeted for treatment of breast carcinoma treatment. The aim of this study was to determine vitamin D and MICA levels in serum patients with non-metastatic and metastatic breast carcinoma.

Method: We examined 86 samples of breast carcinoma patients (44 non-metastatic samples and 42 metastatic samples) with a range of 29 - 68 years old. Vitamin D levels were examined by the Enzyme Linked Flourescent Assay (ELFA) method while the MICA levels were examined by Enzyme Linked Immunoabsorbant Assay (ELISA).

Result: There were significant differences in mean vitamin D levels in non-metastatic and metastatic breast carcinomas (29.88 ng/ml vs 19.06 ng/ml; \( p < 0.01 \)). Serum MICA levels in patients with non-metastatic breast carcinoma were lower (333.52 pg/ml) than in metastatic breast carcinoma (333.52 pg/ml vs 528.71 pg/ml; \( p < 0.01 \)). A negative correlation was found between vitamin D levels and MICA in both groups (Pearson correlation, \( p: -0.58 \)).

Conclusion: Metastatic breast carcinoma had lower vitamin D levels and higher serum MICA levels than non-metastatic breast carcinoma.

Keywords: Breast carcinoma, Vitamin D, MICA.
of breast carcinoma are metastasis, where 400,000 patients in the world died each year, the most common metastases are bone metastases (30-85%) with an mean life expectancy of only 25-72 months\textsuperscript{5}.

Major Histocompatibility Complex class I-related chain A (MICA) is a membrane-bound protein that functions as a ligand to stimulate receptor activation of Natural Killer Group 2 Member D (NKG2D). Major Histocompatibility Complex class I - related chain A includes MIC family members expressed in various types of malignant tumors such as breast, colon, liver and melanoma. MICA expression can be triggered by an active pathway in various pathophysiological conditions such as infection and oncogenic transformation (often expressed in epithelial tumors)\textsuperscript{6}.

Holdenrieder\textsuperscript{7} showed that serum MICA levels increased significantly in malignant patients (breast, lung, gastrointestinal, gynecological, kidney, and prostate carcinoma) compared to patients with benign tumors and healthy controls. Serum MICA levels in carcinoma patients are associated with stage and metastasis\textsuperscript{7}. Roshani\textsuperscript{8}in Iran showed that serum MICA has an important role in reducing the expression and presentation of NKG2D receptors in breast carcinoma patients and recommends that MICA be targeted for treatment of breast carcinoma.

Calcitrol inhibits the expression of cytokines IL-1, IL-6, IL-12, and TNF-α and inhibits the expression of Major Histocompatibility Complex (MHC) in both class I and class II Seydelfound that administration of Vitamin D2 was able to suppress MICA expression in hepatocellular carcinoma patients\textsuperscript{9-11}.

Research on serum vitamin D and MICA levels in breast carcinoma in Indonesia, especially in Makassar as long as the researchers’ knowledge has not been done so we are interested in conducting research on the analysis of serum vitamin D and MICA levels in metastatic breast carcinoma and non-metastatic breast carcinoma.

**Materials and Method**

A. **Study Design:** This study aims to find out the differences serum vitamin D and MICA levels in patients with non-metastatic and metastatic breast carcinoma. This study was a descriptive analytic study with a cross sectional approach.

B. **Place and Time of Study**

1. **Study Place**
   a. Outpatient Installation and Inpatient Installation of Surgical Oncology RSUP Dr. Wahidin Sudirohusodo Makassar and other networking hospitals for sampling.
   b. Installation of Clinical Pathology Laboratory RSUP Dr. Wahidin Sudirohusodo, and FKUH Research Unit/RSPHTN Hasanuddin University for examination of serum Vitamin D and MICA levels.

2. **Research Time:** The study was conducted from January-May 2019.

C. **Inclusion and Exclusion Criteria**

1. **Inclusion Criteria:**
   a. Research subject group: adult women (aged 20-70 years) who were diagnosed with breast carcinoma by the clinician in the Surgical Oncology Department based on history taking, physical examination, laboratory examination, radiological examination and/or histopathology and had never received chemotherapy, radiotherapy and surgery.
   b. Willing to participate in research by signing an informed consent.

2. **Exclusion Criteria:**
   a. Patients detected suffer from other primary malignancies.
   b. Breast carcinoma patients diagnosed with infectious diseases.
   c. Lipemic, icteric or hemolytic specimens.
   d. Insufficient sample volume.
   e. Incomplete data.

D. **Research Permit and Ethical Feasibility:**

Every action in this study was conducted with the permission and knowledge of the patients which were used as research samples through an informed consent sheet and stated to fulfill ethical requirements to be carried out from the Health Research Ethics Commission of the Faculty of Medicine, Hasanuddin University-Hasanuddin Hospital-RSUP Dr. Wahidin Sudirohusodo Makassar (KEPK FKUH-UH-RSWS).

E. **Research Process:**

a. Record identity of patients who meet the inclusion criteria and provide a complete explanation of what
will be done to them and if they agree they will fill out and sign an informed consent.

b. Subjects who fulfilled the inclusion criteria were sampling of 3 ml venous blood. The serum is obtained after a blood-filled tube forms a clot for 30 minutes at room temperature and then centrifuged for 20 minutes at 3000 rpm. Samples were collected enough, stored at 80°C for 12 months, when examined the samples were thawed at 25°C before analysis.

c. Laboratory examination:

1. Vitamin D levels were examined using the Vidas Biomerieux device in principle with the Enzyme Linked Flourescent Assay (ELFA) using the Biomereux reagent VIDAS 25OH Vitamin D.

2. MICA levels were examined using the Microplate Reader Multiscan FC Thermoscientific with the principle of an Enzyme-Linked Immunoabsorbant Assay test (ELISA) using the Human MICA ELISA reagent kit (Bioassay Technology Laboratory).

F. Analysis Method: Data distribution was tested for normality using the Kolmogorov-Smirnov test. If the distribution of data is normal, the serum vitamin D and MICA levels between the two groups (metastatic and nonmetastatic breast carcinoma) were tested using c. The difference was found to be significant if the value of \( p < 0.05 \). Correlation test between serum vitamin D and MICA levels was tested using the Pearson correlation test. Correlation was stated as significant if the value of \( p < 0.05 \).

Results and Discussion

The subject of this research was enrolled for 5 months, breast carcinoma patients who were treated at RSUP Dr. Wahidin Sudirohusodo Makassar and fulfilling the inclusion criteria were 88 patients. As many as 2 patients were excluded, due to incomplete data, so that the data included in the analysis were 86 samples. Patients with non metastatic breast carcinoma were 44 patients and metastatic breast carcinoma were 42 patients. The age of the subjects was 33-76 years, with a median of 50 years. Breast carcinoma patients aged <40 years are around 2.33%, and > 70 years are around 3.49%. This study showed that most breast carcinoma patients in RSUP Dr. Wahidin Sudirohusodo Makassar were in the age group 40-49 years (Table 1).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of Samples [n (%)]</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non Metastatic Breast Carcinoma</td>
<td>Metastatic Breast Carcinoma</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>Aged (Year)</td>
<td>44 (51.2)</td>
<td>42 (48.8)</td>
<td>86 (100)</td>
<td></td>
</tr>
<tr>
<td>&lt;40</td>
<td>1 (1.16)</td>
<td>1 (1.16)</td>
<td>2 (2.33)</td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>23 (26.74)</td>
<td>17 (19.77)</td>
<td>40 (46.51)</td>
<td></td>
</tr>
<tr>
<td>50-59</td>
<td>11 (12.79)</td>
<td>22 (25.58)</td>
<td>33 (38.37)</td>
<td></td>
</tr>
<tr>
<td>60-69</td>
<td>6 (6.98)</td>
<td>2 (2.33)</td>
<td>8 (9.30)</td>
<td></td>
</tr>
<tr>
<td>&gt;70</td>
<td>3 (3.49)</td>
<td>0 (0.00)</td>
<td>3 (3.49)</td>
<td></td>
</tr>
<tr>
<td>Histopathological Grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adenocarcinoma</td>
<td>1 (1.16)</td>
<td>6 (6.98)</td>
<td>7 (8.14)</td>
<td></td>
</tr>
<tr>
<td>IDC</td>
<td>27 (31.40)</td>
<td>11 (12.79)</td>
<td>38 (44.19)</td>
<td></td>
</tr>
<tr>
<td>IDC Low Grade</td>
<td>6 (6.98)</td>
<td>6 (6.98)</td>
<td>12 (13.95)</td>
<td></td>
</tr>
<tr>
<td>IDC Moderate Grade</td>
<td>1 (1.16)</td>
<td>5 (5.81)</td>
<td>6 (6.98)</td>
<td></td>
</tr>
<tr>
<td>IDC High Grade</td>
<td>9 (10.47)</td>
<td>12 (13.95)</td>
<td>21 (24.42)</td>
<td></td>
</tr>
<tr>
<td>Papillary Karsinoma</td>
<td>0 (0.00)</td>
<td>2 (2.33)</td>
<td>2 (2.33)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary Data

Description: \( n \) = Number of samples; IDC = Invasive Ductal Carcinoma.
Hadi\textsuperscript{12} found that breast carcinoma patients in developing countries were found in a younger population than in western countries with a majority of productive age (20-50 years). According to the CDC, breast carcinoma at \(< 45\) years can be caused by several risk factors such as a history of breast or ovarian carcinoma, genetic factors and a positive family history.\textsuperscript{13}

The serum vitamin D levels obtained were normally distributed by the Kolmogorov-Smirnov test. The mean serum vitamin D level in patients with non metastatic breast carcinoma is 29.88 ng/ml, with a value range of 9.7-33.7 ng/ml. The mean serum vitamin D level in patients with metastatic breast carcinoma is 19.06 ng/ml with a value range of 10.5 - 58.7 ng/ml. Comparison of mean vitamin D levels between the two groups was tested using the t-test. There were significant differences in the mean vitamin D levels in the non metastatic and metastatic breast carcinoma groups with a value of \(p < 0.01\) (Table 2).

**Table 2. Comparison of serum vitamin D levels in nonmetastatic and metastatic breast carcinoma groups.**

<table>
<thead>
<tr>
<th>Group</th>
<th>n (%)</th>
<th>Vitamin D Level (ng/ml)</th>
<th>Mean</th>
<th>SD</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non Metastatic Breast Carcinoma</td>
<td>44 (51.2)</td>
<td>29.88</td>
<td>8.46</td>
<td></td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Metastatic Breast Carcinoma</td>
<td>42 (48.8)</td>
<td>19.06</td>
<td>5.39</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** * Independent t-test

The difference in mean serum vitamin D levels in both groups can be seen in Figure 1, where the mean vitamin D level in the nonmetastatic carcinoma group was higher than metastasis.

![Figure 1. Comparison of mean serum vitamin D levels between nonmetastatic and metastatic breast carcinomas. (source: primary data)](image-url)
Alco\textsuperscript{14} found a median level of 25-OHD 19.76 in patients with breast carcinoma, and a serum 25-OHD level was lower in breast carcinoma patients who died than those who were still alive. Janbabai’s study in 2016 found an association between 25-hydroxyvitamin D levels and metastatic breast carcinoma. Patients with distant metastatic breast carcinoma had lower vitamin D levels (12.22 ng/ml) than patients without distant metastasis (23.7 ng/ml)\textsuperscript{15,16} showed that there was a relationship between vitamin D deficiency and breast carcinoma, where serum vitamin D levels are significantly lower in breast carcinoma (85.7%) than in control group (55.8%). White\textsuperscript{17} found that giving vitamin D can inhibit the progression of breast carcinoma. This further affirm that vitamin D has an antitumor effect that can inhibit proliferation and invasive cancer cells, induction of differentiation and apoptosis, anti-proliferation and antiangiogenesis\textsuperscript{18}.

The dysregulation of vitamin D metabolism in metastatic breast carcinoma is thought to be due to the effects of tumor paracrine and dysregulation of the 24-hydroxylase enzyme that plays a role in serum vitamin D homeostasis. In addition, microarray analysis shows the relationship of vitamin D with Cyclin-dependent kinase inhibitor P21, which plays a role in controlling the cell cycle. Beckett also found an association of vitamin D levels with overexpression of miR-26 and miR200 associated with increased motility, adhesion and invasion of EMT in metastatic breast carcinoma\textsuperscript{19}.

Data distribution of serum MICA levels was found to be normally distributed when tested by the Kolmogorov-Smirnov test. The mean serum MICA level in patients with metastatic breast carcinoma is 333.52 pg/ml, with a value range of 177-552 pg/ml. The mean serum MICA level in patients with metastatic breast carcinoma was 528.71 pg/ml with a value range of 364-694 pg/ml. Comparison of mean serum MICA levels between the two groups was tested using the t-test. It was found a significant difference in serum MICA levels in nonmetastatic and metastatic breast carcinoma groups with a value of \( p < 0.01 \) (Table 3).

<table>
<thead>
<tr>
<th>Group</th>
<th>MICA Level (ng/ml)</th>
<th>n (%)</th>
<th>Mean</th>
<th>SD</th>
<th>( P^* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non Metastatic Breast Carcinoma</td>
<td>44 (51.2)</td>
<td>333.52</td>
<td>79.40</td>
<td></td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Metastatic Breast Carcinoma</td>
<td>42 (48.8)</td>
<td>528.71</td>
<td>105.13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: * Independent t-test

The difference in mean serum MICA levels in both groups can be seen in Figure 3, where the mean serum MICA level in the metastatic carcinoma group was higher than nonmetastasis.

Major Histocompatibility Complex Class I - related Chain A can be detected in Leukemia patients and tumors in epithelial cells including breast, lung, colon, kidney, ovarian and prostate malignancies\textsuperscript{20-21}. Recent study showed that the expression of MICA is limited to the proliferation of epithelial cells but is not expressed in quiescent cells. It has been reported that over-expression of several oncogenes can induce MICA expression independently\textsuperscript{22}. Increased MICA soluble is detected in patients with pancreatic adenocarcinoma, various gastrointestinal malignancies, hepatocellular carcinoma, pulmonary carcinoma, malignant melanoma and various types of leukemia.

The initial stages of tumorigenesis begin with the loss of tumor suppressor gene function (gatekeeper) and activation of oncogenes, resulting in hyperproliferation. At this stage the active E2F transcription factor is needed for the cell cycle to take place, but it can also activate MICA transcription. Some findings indicate a direct relationship between the stages of tumor cell proliferation and MICA induction. Strong proliferative signals can cause DNA damage which results in an upregulation response of MICA and PI3K known to increase proliferation which indirectly also increases MIC transcription\textsuperscript{23}.

Table 3. Comparison of serum MICA levels in nonmetastatic and metastatic breast carcinoma groups.
The study by Cascone\textsuperscript{24} in patients with Non Small Cell Lung Carcinoma (NSCLC) found an increase in MICA expression associated with prognosis. MICA overexpression is closely related to DNA damage. The MICA-NKG2D bond can be a NK cell antitumor response costimulator. Tumor cells will protect NK cells through several mechanisms, namely MICA release, proteolytic action of metalloprotease, and suppression of NKG2D regulation on the cell surface.

Correlation of vitamin D and MICA levels in patients with breast carcinoma, followed by the Pearson correlation test. It was found that there was a significant negative correlation between Vitamin D and MICA levels in breast carcinoma patients ($p < 0.0001$) with strong correlation strength ($r = -0.58$), as seen in table 4. This indicates that the lower the vitamin D level then the higher the MICA level and the risk of metastasis in breast carcinoma will increase.

![Figure 2. Comparison of mean serum MICA levels between nonmetastatic and metastatic breast carcinomas. (source: primary data)](image)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>n (%)</th>
<th>Mean</th>
<th>r*</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin D Level</td>
<td>86 (100)</td>
<td>25.08</td>
<td>-0.58</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>MICA Level</td>
<td>86 (100)</td>
<td>428.85</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: * Pearson Correlation Test

Vitamin D can inhibit the expression of Major Histocompatibility Complex (MHC) molecules, both MICA and MICB, costimulatory molecules (CD40, CD80, and CD86), inhibition of dendritic cell maturation and inhibition of proinflammatory cytokines (IL-1 and TNF). In addition, Vitamin D is also able to
increase chemotaxis and phagocytosis of monocytes, is cytotoxic to tumor cells and bacteria, and many other effects\textsuperscript{10}. The interaction of MICA and NKG2D plays an important role in NK cell activation and tumor immunosurveillance. Chitadze\textsuperscript{23} found that NKG2D deficiency was associated with EMT which increased tumor invasion and metastasis.

**Conclusion**

a. Vitamin D levels in patients with metastatic breast carcinoma are lower than vitamin D levels in non metastatic breast carcinoma.

b. Serum MICA levels in patients with metastatic breast carcinoma are higher than serum MICA levels in non metastatic breast carcinoma.

c. Vitamin D levels were inversely correlated with serum MICA levels in patients with breast carcinoma.

**Ethical Clearance:** Obtained from university ethical clearance committee.

**Source of Funding:** Self

**Conflict of Interest:** Nil

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Critical Overview of Adolescent Suicides in India; A Public Health Concern

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Abstract

Suicide is the second most leading cause of death among the 15-29 age group (adolescent). The World Health Organization statistics indicate that 8, 00,000 people suicide annually. The National Crime Records Bureau records indicates that suicidal deaths in 2014 is 15.8% more than 2004, 17% of the suicides worldwide happens in India. Suicides is a contingency that affects the victim’s family community and nation at large and has a long lasting effect on the people left behind. The adolescents often don’t get help when needed which leads to suicides. Sustainable Development Goals 3 intents to promote healthy lives and promote wellbeing for all.

Aim: To understand; 1) the percentage increase of suicide in India, difference between male and female suicides, 2) identify states with maximum number of suicides, 3) identify states with maximum number of student suicides, 4) Major Causes for suicide among adolescent male, female and trans gender and to study 5) Major means adopted for suicides in India, 6) Understand the significance promoting wellness addressing adolescent suicides.

Results: there is significant increase in number of suicides form 2013 to 2016 and it affects the nation’s economy. The states with maximum number of adolescent suicides are 1) Maharastra, 2) Tamil Nadu, 3) West Bengal, 4) Madhya Pradesh and 5) Karnataka. The major Causes for suicides among adolescents male, female and trans gender were identified. The most common means adopted for suicide among adolescents have been identified and listed.

Conclusion: The adolescent and student suicides in the nation are increasing rapidly causing serious economic burden to the nation. Hence a comprehensive suicide prevention plan must be developed, the policy should individually target the states with highest number of adolescent and student suicides, access to the most prominent means of suicides must be limited. A national suicide prevention help line and community based access points could be created to provide mental health first aid to the vulnerable adolescents and students.

Keywords: Adolescent Suicides, Student Suicides, Economic Burden of Suicides, Suicide Prevention Policy, Adolescent Wellness, Adolescent Suicides in India, Suicides in Indian States.

Introduction

WHO recognizes suicides as a public health priority and plans to increase the awareness regarding suicide and suicide attempts and intents to make suicide prevention as global public health priority. The Sustainable Development Goals (SDGs) 3 is to ensure healthy lives and promote wellbeing for all.¹ The WHO statistics indicate that 8, 00,000 people attempt suicide and many more attempt suicide suicides. Suicide is the
second most leading reason cause of death among the age group 15-29 age group (adolescent), 79% of the suicide worldwide happens in lower middle income country and hence India is at greater risk.\(^{(2)}\) The National Crime Records Bureau reports indicate that the suicides rate has increased 15.8% from 2004 to 2014\(^{(3)}\), this significantly impairs the nation’s development the government and parents of the adolescents spend considerable amount of money in their upbringing.

Suicidemental health problems and depression has high correlation especially in developed nations. Suicide occurs impulsively at crisis situations as the victim is not able to deal with the life stress in situations such as; financial problems, relationship issues and chronic diseases. The most significant factor for suicide is a previous suicide attempt. The crucial aspect in suicide risk reduction is to identify the Causes for suicide and address them and to limit access to the means of suicides.\(^{(4)}\)

Research studies indicate that; indicate that suicide victims and inpatients showed similarly high rates of affective disorders. The suicide victims with family history of affective disorders and suicidal tenancies are more vulnerable to suicide. Four significant risk factors identified are 1) Bipolar Disorders, 2) Affective disorders with comorbidity, 3) Lack of previous mental health treatment and 4) availability of fire arms which accounted for 81.9% of cases.\(^{(4)}\) Prevention programs including Peer Educators (PEs) have been found useful in helping young people in school especially the adolescents going through heavy psychological burden. The results indicate that that the mindfulness and Support, Appreciate, Listen, Team (SALT) using Peer Educators (PE) have enhanced the PEs broad emotional intelligence and PEs expressed increased ownership of life, taking actionand seeking support when needed. Research studies also suggest that future research should be carried out in developing nations to understand the knowledge regarding suicides especially in the adolescent age group\(^{(5)}\). WHO further emphasizes that India develop a comprehensive suicide prevention plan and integrate it with the mental health act to contain the growing threat of adolescent suicides.\(^{(1)}\)

**Method**

This study is based on the secondary data available from the official government websites. The adolescent suicides related data from 2013 to 2016 has been used in the study. The basic statistical analysis was done using Microsoft Excel 2013.

The rationale behind this study is to understand 1) National adolescent suicide rate and difference between male and female suicides, 2) States with highest number of suicides, 3) States with highest number of student suicides and rate of student suicides, 4) Major Causes for adolescent suicides 5) Major means adopted by adolescent suicides and 6) Understand the significance promoting wellness addressing adolescent suicides. The researcher would also attempt to identify future research areas and try to lay down a comprehensive suicide policy guidelines keeping in mind the recommendations of WHO and UNICEF and relevant research studies.\(^{16}\)

**Results**

1. **Total Suicides among 15-29 Age Group (Adolescent) in India; Years 2013, 2014 & 2015\(^{(6),(7),(8),(9)}\):** The number of suicide in 2013 is 46,368, in 2014 it has raised to 54,100. The percentage increase of suicides form 2013 to 2014 is a whopping 16.675 % which is a matter of concern when we compare this data with the National Crime Records Bureau report stating that “suicidal deaths of 2014 is 15.4% higher than that of 2004”, we can understand the rapid increase in adolescent suicide in India which is a public health concern. The increasing number of suicides is a threat to the nations GDP, it’s estimated that death of one adolescent between the 15-29 years cost approximately 70 lakhs. The economic loss in 2014 alone would account to 70 lakhs × 54100 adolescent suicides which equals to 378.7 billion rupee, this significantly affect the nation’s economic progress and the public health initiatives.

**Male and Female Suicides among the Adolescent Age Group in India; Years 2013, 2014 And 2015\(^{(6),(7),(8),(9)}\):** There is significant difference between male and female suicides. The number of male suicides is significantly higher than that of the female suicides. The difference between male and female suicide in 2013 is 7,064 suicides, in 2014 the difference between male and female suicides is 9,950 suicides, and in 2015 the difference between male and female suicides is 9,435 suicides.

2. **Suicide Rate amongst Adolescents in India 2013-2015\(^{(6),(7),(8),(9)}\):** States with Highest Number of Suicides: The states with highest number of suicides
in 2013, 2014 & 2015 are 1) Maharashtra, 2) Tamil Nadu, 3) West Bengal, 4) Madhya Pradesh, 5) Karnataka and 6) Andhra Pradesh. Specific strategies must be formed to address suicides in these states as they contribute to the majority of the adolescent suicides in India.

3. Total Number of Student Suicides in India 2013-2016; States with Highest Number of Suicides: The states with maximum number of student suicides in India in the years 2013, 2014, 2015 and 2016 are; 1) Maharashtra, 2) Tamil Nadu, 3) West Bengal, 4) Madhya Pradesh, 5) Karnataka, 6) Chhattisgarh, 7) Andra Pradesh.

The percentage increase in student suicide from 2013 to 2016 is an alarming 18.31%. The government and parents spend a lot of time and effort in developing the career and character of a student and hence the rapid increase in student suicides significantly affects our nation’s developmental gains.

4. Causes for Suicide amongst Adolescent Age Group in India 2013 & 2015; Male, Female & Transgender

Male: Figure No. 1, Causes for Suicide amongst Adolescent Age Group in India 2013 & 2015; Male (Suicide rate in percentage).

The most common Causes for suicide among male in 2014 and 2015 are: 1) Other Causes, 2) Other Family Problems, 3) Causes not known, 4) Illnesses, 5) other prolonged illnesses, 6) love affairs, 7) Insanity/Mental Illnesses, 8) Failure in examination, 9) Marriage related issues, 10) Unemployment, 11) Drug Abuse/Addiction

Female: The Figure No. 2, Causes for Suicide amongst Adolescent Age Group In India 2013 & 2015; Female Illustrates that:

The most common Causes for death among adolescent female in India in 2014 and 2015 are; 1) Other Family problems, 2) Other Causes, 3) Marriage related issues, 4) Illnesses, 5) Causes not known, 6) Other Prolonged Illness, 7) Love affairs, 8) Dowry Related Issues, 9) Insanity/Mental Illness, 10) Examination Failures.

Transgender: The Figure No. 3, Causes for Suicide amongst Adolescent Age Group in India 2013 & 2015; Transgender illustrates that:-

The most common Causes for adolescent transgender suicides in 2014 and 2015 are; 1) Other Causes, 2) Illnesses, 3) Other Prolonged illness, 4) Suspected/illicit relation, 5) Professional/Career Problem, 6) Other family problem, 7) Insanity/Mental illnesses:-, 8) Drug Abuse Addiction, 9) Causes not known.

5. Means of Suicide Adopted by Adolescent Age Group in India; Male, Female and Transgender in 2013 and 2015;

Male: The Figure No. 4, Means of Suicide Adopted By Adolescent Age Group in India 2013 & 2015; Male illustrates that:-

The most common means adopted by adolescent male in 2013 and 2015 in India are; 1) Hanging, 2) Poisoning, 3) consumption of insecticides, 4) fire/self-immobilization, 5) consumption of other poison, 6) other means, 7) drowning, 8) coming under running trains, 9) jumping, 10) overdose of sleeping pills.

Female: The Figure No. 5, Means of Suicide Adopted By Adolescent Age Group in India 2013 & 2015; Female illustrates that:

The most common means adopted by women in the adolescent age group for suicide in the years 2013 and 2014 are 1) Hanging, 2) Poisoning, 3) consumption of other poison, 4) fire self-immobilization, 5) consumption of other poison, 6) other means 7) drowning, 8) coming under running vehicles/trains, 9) Jumping and 10) over dose of sleeping pills.

Transgender: The Figure No. 6, Means of Suicide Adopted By Adolescent Age Group in India 2015; Transgender illustrates that:-

The most common Causes for suicide among transgender suicides in India are; 1) by fire/self-immobilization, 2) by hanging, 3) Jumping and 4) jumping of moving trains/vehicles.

Discussions and Conclusions

The percentage increase in adolescent suicide in India from 2013 to 2014 is 16.67% is higher than the records published by the National Crime Records Bureau 15.4% in increase from 2004 to 2014. The economic loss caused by adolescent suicides in 2014 accounts to 378.7 billion rupees which seriously affects the nation’s developmental gains. The priority should be to prevent male suicides which is significantly higher than that of female suicides in India. The government and NGO’s must individually target the states with
The maximum number of suicides in 2013, 2014 and 2015 were in: 1) Maharashtra, 2) Tamil Nadu, 3) West Bengal, 4) Madhya Pradesh, 5) Karnataka and 6) Andhra Pradesh.

The percentage increase in student’s suicide from 2013 to 2016 is 18.31% is alarming. The states with the maximum number of student suicides should be individually targeted and suicide prevention strategies involving student volunteers and teachers could be introduced in the educational institutions to address student suicides.

The best way to prevent adolescent suicides is to understand the Causes for suicides and to take appropriate measures to address them states the WHO, hence the suicide prevention policy could try and target people who are vulnerable to; other causes, other family problems, causes not known, love affairs, illnesses, other prolonged illnesses, insanity or mental illness, failure in exams, marriage related issues, dowry problems, drug abuse/addiction, unemployment, suspected/illicit relations and professional and career problems.

Preventing access to the means of suicide helps in reducing the number of suicides as per WHO guidelines and we suicide prevention policy could try and limit access to the most common means of adolescent suicides; Hanging, poisoning, consumption of insecticides, consumption of other poison, other means, drowning, coming under running vehicles/trains, jumping, jumping of moving vehicles, overdose of sleeping pills, fire/self-immobilizing.’

Further research must be done to understand: 1) high number of male suicides, 2) high number of student suicides, 3) high student and adolescent suicides in certain states, 4) the leading causes of adolescent suicide other family problems and other problems, 5) the actual number of transgender suicides in India.

The government should try and develop a suicide prevention policy considering the recommendations; 1) the states with highest number of adolescent and student suicides should be targeted individually, 2) student volunteers should be trained in educational institutions to give support to the students, 3) the adolescents who are vulnerable to common means of suicide should be assisted, 4) Access to the common means of suicide should be reduced 5) government should try and start a suicide prevention helpline, computer based and mobile based chat support to help adolescents 6) community based access points to give mental health first aid 7) Community mental health volunteers could be trained and employed in the PHC-SHC-CHC respectively. The primary focus should be to reduce the adolescent suicides and to foster their growth for the betterment of the nation.

Figure No. 1, Causes for Suicide amongst Adolescent Age Group in India 2013 & 2015; Male (Suicide rate in percentage)}^{(16)(17)}
Figure No. 2, causes for Suicide amongst Adolescent Age Group in India 2013 & 2015; Female (Suicide rate in percentage)(16)(17)

Figure No. 3, Causes for Suicide amongst Adolescent Age Group in India 2013 & 2015; Transgender (Suicide rate in percentage)(16)(17)
Figure No. 4, Means of Suicide Adopted By Adolescent Age Group in India 2013 & 2015; Male (Suicide rate in percentage)\(^{14(15)}\)

Figure No. 5, Means of Suicide Adopted By Adolescent Age Group in India 2013 & 2015; Female (Suicide rate in percentage)\(^{14(15)}\)
Figure No. 6, Means of Suicide Adopted By Adolescent Age Group in India & 2015; Transgender. (Suicide rate in percentage)\(^{(14)}\)

**Ethical Clearance:** Not Required

**Conflict of Interest:** Nil

**Funding:** Self

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How are Government’s Liability in Indonesia and Netherland?: Juridical-Normative Study with a Comparative Approach

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Abstract

Indonesian liability is included as the Government’s responsibility, namely as a compulsory compliance obligation of the state or government officials or other who carry out government’s functions as a result of an objection, a law, a judicial review, which is submitted by a person, the community, an entity civil law either through court settlement or out of court. The purpose of this study was to compare the responsibilities between Indonesia Government with Netherlands. The study used juridical-normative with a comparative approach based on the statute approach as the object of discussion. This case as a form of Governments’ responsibility both in civil and administrative cases. While accountability of the Government in Netherlands (civil law system) are known with several teachings regarding civil liability, namely: Accountability based on mistakes (schuldaansprakelijkheid), liability based on an error with an inverse proof load (schuldaansprakelijkheid met omkering van de bewijslast), and liability based on risk (risicoaansprakelijkheid). In the Dutch legal system, the equivalent of strict liability is risk-aansprakelijkheid. Responsibility based on risk is a form of responsibility that is not based on the elements of error for the following activities: hazardous material management; waste management installation; and drilling mining activities. The Defendant is free from responsibility based on risk, if: loss arises as a result of war; losses due to extraordinary natural events; losses due to obeying authority orders; losses due to victim’s actions; losses due to third party actions.

Keywords: Comparison, Government Liability, Indonesia, and Netherlands.

Introduction

Government as implementing the legislation certainly has the main task and function for ensuring the creation of public welfare based on the established rules and assignment of bestuurzorg or tasks in the form of public services. State government based on the constitution is a reflection of the rule of law. The concept of a prosperous and society are a concept that includes responsive justice values, which support the objective of the rule of law. The government as the organizer is also demanded to be more flexible towards the problems that occur in the community so that the result of legal products do not harm and guarantee fairness. Furthermore, regarding the state’s liability in the air navigation implementation, the state’s liability could be divided into two, namely liability under the administrative law and liability under the international law.²³ That article said: “Delegation is the delegation of authority from a higher Government Agency and/or Government Officer to a lower Government Agency and/or Government Officer with responsibilities and accountability is fully transferred to the recipient of the delegation”. Even though UUAP distinguishes into two, it does not try to determine the definition of the two. Responsibility is paired with another responsibility while the equivalent responsibility is a liability. It turns out, that there are also those who equate the notion of accountability with accountability which implies the understanding: willingness to sue the responsibilities that have been given to those who accept and are willing to carry out certain tasks. Understanding Accountable means the same as responsible, answerable. Furthermore, the meaning of word accountable, according to the
Contemporary English-Indonesian Dictionary, is responsible. As in writings relating to the contractual relationship between the nurse and her client, many contain a charge of accountability that is equated with accountability. Based on the description above, the researcher will discuss the Liability of the Government in Indonesia and compare it with the Liability of the Government in Netherlands 4,5.

**Material and Method**

Type of research used in this study is juridical-normative research, which is scientific research procedures in finding truth based on the study of legal science in terms of normative which is focused on analyzing the application of norms in positive law 2,3. The approach used is a Comparative Approach, which compares the accountability of the Indonesia Government with Netherlands and the statutory approach, which is used in the contents of legal regulations to examine existing problems. Legal research 3 is a distinctive character of jurisprudence 3,4, to address legal issues that are studied in this research. In legal research, we need a method that is related to the problem to be examined. Source and Type of Data Material: Primary Data, which is legal material that consists of laws and regulations relating to issues raised regarding the comparison of government responsibilities in Indonesia and Netherlands. Secondary data, namely legal material obtained from books, journals, opinions of scholars, and symposiums conducted by experts related to issues raised in research on comparative accountability of governments in Indonesia and Netherlands. Tertiary Data, i.e. legal materials that provide meaningful instructions or explanations for primary and secondary legal materials, such as legal dictionaries in the fields of Administrative Law and Constitutional Law.

Finding: Responsibility in the sense of liability is defined as accountability which is a translation of liability/ aanspralijkheid, a specific form of responsibility. Peter Mahmud Marzuki’s opinion is related with the civil law experts’ opinion in the early 20th century, namely JH Niewenhuis, said that accountability is an obligation to bear compensation as a result of violating the norm. Violating actions of these norms can occur due to: first the act against the law, secondly the interpretation. Furthermore, Nieuwenhuis explained that accountability was based on two pillars, namely violation of law and error. Referring to Niewenhuis 5’s opinion, an understanding can be drawn that the accountability can occur because First of the Law; it means that a particular person/party is declared liable not because of his mistake, but he issued because of the provisions of the law. This kind of accountability is called a risk liability. The primary data used by the Swiss Reinsurance Company is compiled by governments or insurance associations in individual countries.

**Discussion**

The concept of this accountability can we examine based on Peter Mahmud Marzuki’s opinion. He said that the definition of responsibility in the sense of liability is defined as accountability which is a translation of liability/ aanspralijkheid, a specific form of responsibility. According to him, the definition of accountability refers to the position of a person or legal entity deemed to have, to pay a form of compensation after a legal event or legal action. A person, for example, must pay compensation to another person or legal entity for having committed an unlawful act (onrechtmatige daad) which causing harm to that person or other legal entity. The term of accountability is within the scope of private law 5,6,7,8. Peter Mahmud Marzuki’s opinion is related with the civil law experts’ opinion in the early 20th century, namely JH Niewenhuis, said that accountability is an obligation to bear compensation as a result of violating the norm. Violating actions of these norms can occur due to: first the act against the law, secondly the interpretation. Furthermore, Nieuwenhuis explained that accountability was based on two pillars, namely violation of law and error. Referring to Niewenhuis 5’s opinion, an understanding can be drawn that the accountability can occur because First of the Law; it means that a particular person/party is declared liable not because of his mistake, but he issued because of the provisions of the law. This kind of accountability is called a risk liability. The second mistake was caused by an agreement between the parties that harmed one of the parties as regulated in Article 1365 of the Civil Code (unlawful acts). This kind of liability is known as accountability based on the element of error and in its development also because the proof is a liability based on the presumption of guilt. The responsibilities and accountability of government positions in the public sector are outlined in the legislation form (regulation), policy regulations (beleidsregel), and state administrative decisions (beschikking), as well as factual actions (feitelijke hendeling), in the form of government actions that are resolved through institutions different courts, if the government’s actions cause harm to citizens.
According to Toshiro Fuke, from the historical aspect of the development of accountability to the state, there are 6 (six) development phases mentioned as follows: since the liberation theory, state liability, non-authoritative activities, the welfare state, the case of compulsory acquisition of property (land in particular), and loss/injury that caused by natural distoter. In a broad sense, state liability is that the state will compensate for any loss that arises and occurs, which is caused directly or indirectly, materially or mentally to the citizens, as a result of using public authority. Premiums are disaggregated into two broad classes: life and property-liability insurance.

The primary data used by the Swiss Reinsurance Company is compiled by governments or insurance associations in individual countries. Recognizing the different valuation bases adopted in different countries, the Swiss Reinsurance Company adjusts the primary data to attain consistency. In particular, an attempt is made to produce premium figures that are gross of reinsurance and gross of commissions. Even though such a valuation basis more closely reflects the demand for insurance rather than the supply, the researcher ensure that data are consistent enough to justify the international comparative analysis adopted in this paper. The definition of criminal liability is proposed by Simons as a psychic state so that the application of a criminal code from a public and private point of view is considered appropriate. Still, according to Simons, the basis of responsibility in criminal law is a certain psychic circumstance in the person committing a criminal act and relationship between the circumstances and the deeds that have been done in such a way that person can be reproached for doing the deed. So it can be deduced that the core of accountability in criminal law as proposed by Simons is: the first one, a person with psychic or mental condition; and second one about the relationship between psychological condition likely stress and self esteem and actions. The term of Governmental Liability is often interchangeable with the term State Liability, for example, JJ Van Der Gouw, et al. (1997) entitled Government Liability in Netherlands said that both the states, central and regional governments, the officer council and other subordinates that have governmental duties which are classified as legal persons who can be held accountable both in civil law and law administration if unlawful actions. Acts of public law (for example in the form of dismissal) article 131 were used, according to him because the use of Article 839 of the German Civil Code which is the personal responsibility of officials (official personality) is often unsatisfactory, so that in turn can lead to public distrust of the government. In general, the definition of Government Responsibility is the compulsory compliance obligation of the state or government or government officials or other officials who carry out government functions as a result of an objection, lawsuit, judicial review, which is submitted by a person, the public, a good legal entity through court settlement or out of court for fulfillment in the form of (a) payment of a sum of money (subsidies, compensation, benefits, etc.); (b) issue or cancel/revoke a decision or regulation, and (c) other actions that fulfill their obligations, for example, to carry out more effective and efficient supervision, prevent danger to humans or the environment, protect citizens’ property, manage and maintain public facilities and infrastructures, impose sanctions for violations and so on. The understanding is clear that governmental liability is more emphasized on civil and administrative liability, while criminal liability is attached to the personal acts of the officials concerned, for example, corruption, murder, adultery, etc. by criminal provisions. In the context of governmental liability, in the field of civil law is generally based on an action against the law committed by the authorities (onrechtmatige overheidsdaad or unlawful acts of the government) as determined in Article 1365 of the Civil Code.

The settlement of this civil action can be done through the court or outside the court, namely through the ADR mechanism (al: mediation and arbitration) The procedure for civil litigation pursuant to Article 1365 of the Civil Code is intended for the government to be civilly responsible in the form of compensation payments, so it must be proven: (a) the government’s actions are against the law; (b) truly guilty; (c) the claimant (community/private legal entity) did indeed suffer a loss; (d) the loss is the result of government actions. Governmental responsibility in the scope of administrative law is based on unlawful acts of the government caused by the actions of the government in the form of State Administration Decree made in violation/contravention, at first the laws and the prevailing regulations, the second is contrary to the general principles of good governance as stipulated in Law No. 28 of 1999 concerning Administration of a Country that is Clean and Free of Corruption, Collusion, and Nepotism.
Conclusion

The definition of accountability refers to the position of a person or legal entity deemed to have, to pay a form of compensation after a legal event or action. The liability in Indonesia is included as the Government’s responsibility, namely as a compulsory compliance obligation of the state or government or officials government who carry out government functions as a result of an objection, suit, judicial review, submitted by a person, community, body civil law either through court settlement or out of court.

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Conflict of Interest: No

Source of Funding: Self-funding

Ethical Clearance: This study was approved by the institutional review board of Ethical Approval The research received a certificate from the University of Muhammadiyah Mataram.

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Mediating Effect of Self-Leadership in the Relation between Job Commitment and Job Competence among Care Workers in Korea

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Abstract

Background/Objectives: The purpose of this study is to provide basic data for nursing intervention development that enhances the job competence of care workers by exploring the mediating effect of self-leadership in the relationship between job commitment and job competence.

Method/Statistical analysis: Data were collected using a questionnaire targeting 96 care workers belonging to 5 home-based elderly welfare centers in D city. Data were analyzed by descriptive statistics, Pearson correlation coefficients, multiple regression and Sobel’s test.

Findings: The care workers’ job commitment scored 3.99 points, self-leadership scored 3.82 points, and job competence scored 3.95 points out of 5 points. The job competence of subjects was a high positive correlation with job commitment (r=.78, p<.001), and self-leadership (r=.86, p<.001). The main factor influencing the subject’s job competence was self-leadership (β=.75, p<.001), and 74.9% of job competence was explained. In addition, self-leadership had a complete mediating effect in the relationship between job commitment and job competence.

Improvements/Applications: Job commitment and self-leadership showed a high correlation with job competence, self-leadership had a complete mediating effect. Therefore, the directors should place importance on job-related factors of care workers. It is necessary to develop and operate a leadership improvement program to foster self-leadership.

Keywords: Job commitment, Self-leadership, Job competence, Care workers, Mediating effect.

Introduction

The influence of the elderly in Korean society is increasing continuously. More than half of the elderly in Korea evaluate their health as average or bad, and are suffering from the disease for more than 3 months, 89.5% of the elderly responded that they had chronic diseases diagnosed by a doctor, and the entire population of elderly people have an average of 2.7 chronic diseases, and 83.5% of elderly people have taken prescription drugs prescribed by doctors for more than 3 months. In addition, the physical and cognitive function of the elderly also has a higher rate of restriction as the age increases, and 71.4% of the subjects with reduced physical function appear to be receiving care[1]. Overall, there is a need for a systematic care service policy for the elderly.

76.3% of the elderly in Korea currently live separately from their children, so the demand for home-visit care services provided by care workers is expected to continue to increase[1] and the elderly prefer to receive care at home, and the family is hoped that caregivers will visit home and provide services. Accordingly, the care
service providers for the elderly under the long-term care insurance for the elderly in Korea are care workers, and the job competence of care workers can be evaluated in terms of service quality. Job competence is an action that leads to successful outcomes through interaction with behavioral characteristics observed from those who generate high performance, that is, knowledge, skills, attitudes, and values. In particular, in the case of care workers since their competence plays an even more important role in the health and well-being of the subject.

According to the research to date, it has been said that if care workers have excellent competence, expertise and skill, they can satisfy the needs of recipients and provide quality services. In the case of 123 care workers job competence was about 3.66 out of 5 points, and as a result of measuring the job competence of 116 care workers, it was 3.79 out of 5 and it needs to be made so that they have higher job competence. In order to increase the job competence of these care workers, it is necessary to analyze the factors that affect job competence improvement.

In this study considers the results that the degree of commitment to one’s job affects job performance, and leadership affects job competence and performance. Job commitment means that one’s job becomes the center of one’s life, the desire to actively participate in the job becomes stronger, and the job is the standard in the process of establishing and realizing the concept of self and it is the degree to which he is immersed in his current job based on specific beliefs about the relationship between himself and his current job. Immersion is a result of the ability to experience and this level of job commitment appears more strongly in performance-related situations and situational characteristics.

On the other hand, self-leadership can be said to be able to exercise leadership by controlling and managing thoughts and actions with one’s own autonomy. According to a study, the self-leadership of 311 daycare center teachers was a major factor influencing teacher competency and as it was found that childcare teachers with high self-leadership have higher awareness of expertise and more positive verbal interactions, it is inferred that it will have a major impact on enhancing the job competence of care workers.

Therefore, the purpose of this study is to empirically test the mediating effect of self-leadership in the relationship between job commitment and job competence and provide basic data for developing strategies to increase the job competence of care workers.

**Method**

1. **Subjects:** The subjects of this study were 96 care workers in charge of home-visit care belonging to 5 home-based elderly welfare centers of D city, who were adult men and women who understand the purpose of the study and voluntarily expressed their willingness to participate and gave written consent, who were care workers with more than 6 months of job experience. The number of subjects was calculated using the G-power 3.1.9.4 program. The number of samples required to maintain 2 predictors, effect size of .15, significance level of .05, and power of .90 was 88, and 96 people were surveyed considering the dropout rate of 10%.

2. **Instruments**

   2.1. **Job commitment:** A job commitment tool revised by Park was used. This tool has a total of 9 questions, and on a Likert 5-point scale, the higher the score, the higher the degree of job commitment. In the study by Park, the reliability was Cronbach’s α=.92. In this study, it was .90.

   2.2. **Self-leadership:** A self-leadership tool revised by Koh was used. There are 20 questions. On a Likert 5-point scale, the higher the score, the higher the degree of self-leadership. In Koh’s study, the reliability of the sub-area was Cronbach’s α=0.78~0.86. In this study, it was .94.

   2.3. **Job Competence:** A tool reconfigured by Lee from National Competency Standards for care workers was used. There are 24 questions. On a Likert 5-point scale, the higher the score, the higher the degree of job competence. In Lee’s study, the reliability Cronbach’s α=.85. In this study, it was .94.

3. **Data collection:** Data collection was from July to August 2020. Researchers and research assistants visited 5 home-based elderly welfare centers in D city, and after receiving permission by explaining the research purpose and method to the center director, after meeting, the research purpose was explained directly to the nursing care provider and received a written consent with the help of a research assistant, especially in the data collection method. After that, data was collected through completing...
questionnaires. The time required to complete the questionnaire was 15 minutes.

4. **Ethical consideration:** This study was approved by the institutional review board of K University after submitting a proposal for ethics of the subject for deliberation (KNU_IRB_2020-44). The code of ethics was followed.

5. **Data Analysis:** Using the SPSS Window 23.0 program, the degree of variables of care workers was calculated by descriptive statistics, the correlation between job commitment, self-leadership and job competence was calculated using Pearson’s correlation coefficients, and the mediating effect was obtained using multiple linear regression, and the significance test for the mediating effect size was analyzed with the Sobel’s test.

**Result and Discussion**

1. **General characteristics of subjects:** The subjects of this study were care workers in charge of home-visit care (100%), and the age ranged from 32 to 76 years old, with an average of 57.78±8.89 years old, with age over 60 years accounting for 44.8% (44) over 60 years old. Most (96.9%) were women, and the most frequent education level was high school graduate with 48.9% (44), and the average work experience as a care worker was 42.59±31.82 months, ranging from 7 months to 11 years. It was found that more than half (69.4%, 77) had no other licenses other than the care worker license. Most of them (74.4%) received less than 1 education session during the past year, and for the monthly income, 0.51-1 million won accounted for more than half (55.2%).

2. **Degree of Job commitment, Self-leadership and Job Competence in Care workers:** The care workers’ job commitment scored 3.99 points out of 5 points, self-leadership scored 3.82 points out of 5 points, and job competence scored 3.95 points out of 5 points [Table 1].

<table>
<thead>
<tr>
<th>Variables</th>
<th>M±SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job commitment</td>
<td>3.99±0.61</td>
<td>1~5</td>
</tr>
<tr>
<td>Self-leadership</td>
<td>3.82±0.48</td>
<td>1~5</td>
</tr>
<tr>
<td>Job competence</td>
<td>3.95±0.46</td>
<td>1~5</td>
</tr>
</tbody>
</table>

3. **Correlation between job commitment, self-leadership and job competency in subjects:** Job competence and job commitment (r=.78, p<.001), job competence and self-leadership (r=.86, p<.001), and self-leadership and job commitment (r=.86, p<.001) of subjects showed high positive correlations [Table 2].

<table>
<thead>
<tr>
<th>Variables</th>
<th>Job commitment r(p)</th>
<th>Self-leadership r(p)</th>
<th>Job competence r(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job commitment</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-leadership</td>
<td>.86(&lt;.001)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Job competence</td>
<td>.78(.025)</td>
<td>.86(&lt;.001)</td>
<td>1</td>
</tr>
</tbody>
</table>

4. **Mediating effects of self-leadership in the relation between job commitment and job competence in subjects:** As a result of examining the multicollinearity, the Durbin-Watson index for autocorrelation was 1.96, which was close to 2, which was independent. The multicollinearity between the independent variables was less than 10 with a VIF (Variance Inflation Factor) index of 3.90, and the tolerance was 0.26, which was higher than the standard value of 0.1, indicating that there was no multicollinearity, so this data was suitable for regression analysis.

Self-leadership, a parameter between job commitment and job competence, had a significant influence in the regression analysis in step 3.

As a result of the regression analysis of step 1, job commitment, an independent variable, had a statistically significant effect on self-leadership, a mediating variable (β=.86, p<.001), and the explanatory power to
explain self-leadership was 74.4%. In step 2 regression analysis, job commitment, an independent variable, had a significant effect on job competence, a dependent variable ($\beta=.78$, $p<.001$), and the explanatory power to explain job competence was 60.4%. To test the effect of self-leadership as an intermediary variable on job competence as a dependent variable in step 3, as a result of regression analysis with job commitment and self-leadership as predictive factors and job competence as the dependent variable, job commitment ($\beta=.13$, $p=.211$) was not significant, but self-leadership ($\beta=.75$, $p<.001$) was a significant predictor of job competence.

As a result of comparing the $\beta$ values, it was found that self-leadership was completely mediated since .78 in step 2 was greater than .13 in step 3, and job commitment in step 3 was not statistically significant. The degree to which self-leadership explains job competence was 74.9%. As a result of conducting Sobel’s test to confirm the significance of the mediating effect coefficient, it was statistically significant ($Z=7.14$, $p<.001$) [Table 3].

**Table 3. Mediating effects of self-leadership in the relation between job commitment and job competence**

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
<th>Adj. $R^2$</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: Job commitment→ Self-leadership</td>
<td>.68</td>
<td>.86</td>
<td>16.52</td>
<td>&lt;.001</td>
<td>.741</td>
<td>272.82</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Step 2: Job commitment→ Job competence</td>
<td>.59</td>
<td>.78</td>
<td>11.99</td>
<td>&lt;.001</td>
<td>.600</td>
<td>143.67</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Step 3: Job commitment, Self-leadership→ Job competence</td>
<td>.744</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>138.95</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

1. Job commitment→Job competence | .09 | .13     | 1.26 | .211  |            |       |        |
2. Self-leadership→Job competence | .72 | .75     | 7.33 | <.001 |            |       |        |

$Z=7.14$, $p<.001$

**Discussion**

This study was attempted to understand the mediating effect of self-leadership in the relationship between job commitment and job competence.

The job commitment of this study was 3.99 out of 5 points, which was higher than the level of job commitment of 3.82 points [6] as a result of a survey of employees who received job training in securities companies. The life of care workers serving and providing care to others can be regarded highly as a desirable job in the profession and needs to be supported so that it can be further improved. The self-leadership score was 3.82 out of 5, somewhat higher than the self-leadership of the daycare center teachers which was 3.75 [7]. Self-leadership is a way of thinking about yourself and your role in what you’re doing, and care workers have a professional sense of duty to take the lead in helping the vulnerable subjects and it is judged that they have the ability to perform their role as a leader. In the future, if education to improve such leadership is given, it can be further improved. Also, the job competence of care workers was 3.95 out of 5, which was slightly higher than that of 3.68 points of job competence of 217 care workers who provide home-visit care services with more than 1 month’s experience [15]. The results of this study are considered to be the result of having subjects with higher job competency as they were subjects who provided nursing services for more than 6 months.

The relationship between the subject’s job competence, job commitment, and self-leadership showed a high positive correlation. This was similar to the result [16] showing a positive correlation between the job commitment of the cabin crew of a low-cost airline and 3 sub-areas of job competence. In addition, the self-leadership of daycare center teachers showed a positive correlation with the teaching competence, which is consistent with the result [7] that the higher the self-leadership, the higher the teaching competency. Therefore, it is recommended to consider job commitment and self-leadership in education and activities to increase the job competence of care workers. Also, in the relationship between job commitment and job
competence, self-leadership had a complete mediating effect. This was similar to the result of a study of care workers [17] showing that self-leadership improves the service quality and productivity of the organization. Self-service is a decisive factor for care workers to demonstrate job competence, and self-leadership with expertise and autonomy can help provide quality services and increase productivity. Therefore, it is recommended that home-based elderly welfare center directors develop and apply a self-leadership improvement program as a way to improve the job commitment and job competence of care workers in charge of home-visit care.

Based on the results of this study, it is necessary to increase self-leadership in order to increase the job competence of care workers in charge of home-visit care. In order to do that, one must control oneself and increase self-motivating autonomy, and knowing one’s role and abilities with thinking and action strategies, setting goals and putting them into practice, one should make an effort to take responsibility for the results. Ultimately, these efforts can increase the influence of care workers, and it is thought that they can improve their job competence and increase the satisfaction of the care recipients. Therefore, it is suggested that a leadership improvement program be developed and actively used as supplementary education for care workers.

**Ethical Clearance:** Not required

**Source of Funding:** Self

**Conflict of Interest:** Nil

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Periodic Acid Schiff (PAS) Staining: 
A Useful Technique for Demonstration of Carbohydrates

Swapna Shedge A., Priya Roy, Ajay Shedge, Megha A. Doshi

Abstract
The term mucosubstances is used to denote all tissue components other than glycogen, rich in carbohydrates, which are present in connective tissue or as secretion of certain epithelial structures. Connective tissue mucosubstances are called “mucopolysaccharides”, while those secreted by epithelia are referred as “mucins”.

Objectives: To show the usefulness of PAS staining in identification of carbohydrates in normal and malignant lesions of mammary gland and endocervical gland.

Methodology: This is a retrospective, observational, analytical, case control study aimed to evaluate mucin histochemical pattern in normal and diseased lesions of mammary and endocervical glands. Twenty five histologically proven blocks of normal and Intraductal carcinoma of mammary gland, normal and adenocarcinoma of endocervical glands were taken. Tissue sections were stained by PAS technique.

Results: Results were tabulated according to colour intensity into different grades ranging from + to ++++. PAS staining of normal endocervical glands showed presence of PAS +ve substances like carbohydrate & mucins. PAS stain for adenocarcinoma cervix gave mild reaction with focal magenta shade, suggestive of presence of few neutral mucosubstances. PAS staining of normal mammary gland and of Intraductal carcinoma showed similar results. Ducts and lobules stained with magenta showed the presence of PAS positive substances like carbohydrate and neutral mucins.

Conclusion: Mucin histochemical patterns serve as valuable, cost-effective tool for diagnosis in histopathology and for the researchers in histology, where a slight change in the mucin pattern may help in the early diagnosis of disease process. PAS technique is perhaps the most versatile and widely used of techniques for the demonstration of glycoproteins, carbohydrates and mucins.

Keywords: Mucins, PAS stain, Normal, Adenocarcinoma, Intraductal carcinoma.

Introduction
Special stains belong to a diverse family of slide-based stains that rely on basic chemical reactions for microscopic visualization and general identification of various tissues, structures, cells, organelles, carbohydrates, minerals and micro-organisms. Introduced to all college biology students through the simple bacterial test known as the Gram stain. Special stains use both, science and art to provide valuable and cost-effective information for pathology laboratory.\(^1\)

Periodic acid (HIO\(_4\)) is an oxidizing agent used initially by Jackson and Hudson (1937) for the chemical estimation of polysaccharides.\(^2\) “McManus” (1946)
was the first to apply Periodic acid to the histological demonstration of mucin, whereas Hochkiss (1948) emphasized the legitimacy of Periodic acid as a special histochemical reagent. Dr. Joseph Forde Anthony McManus (1911-1980) was a Canadian pathologist who is best known for his formulation of one of the most frequently used stains in histopathology; the McManus Periodic-acid Schiff stain. Periodic acid acts upon the 1,2 glycol linkage of carbohydrates in tissue sections to produce aldehyde which can be colored with Schiff’s reagent. The method can be used in paraffin sections or frozen sections and is useful as a reaction for carbohydrates of tissue: i.e glycogen (in paraffin sections only) mucin, basement membrane, reticulin, colloid of thyroid and pituitary stalk, granular cells of renal arteriole etc.

Chemistry
PAS reaction demonstrates aldehyde groups formed by the oxidation of certain tissue carbohydrates and glycogen. The oxidation of the tissue sections is performed using periodic acid. After oxidation, tissue sections are treated with Schiff’s reagent, a colourless mixture of basic fuchsin, HCl and sodium metabisulfite. During incubation, basic fuchsin binds to the newly formed aldehyde groups in the tissue. Rinsing the sections in running water after the Schiff reagent incubation causes the bound basic fuchsin molecules to assume a pink to red color due to molecular changes. Several counterstains may then be used to visualize other tissue elements. Hematoxylin counterstaining is very commonly used to demonstrate cell nuclei, although other counterstains may also be used. Some older method include treating the sections in a sulfurous rinse solution before running water wash. This can serve to reduce background staining by removing excess Schiff’s reagent from the tissue.

Material and Method
The present study was conducted in the Department of Anatomy, Krishna Institute of Medical Sciences University, Karad from May 2010 to June 2018. The type of study was observational, analytical and case control. Work protocol was submitted to the protocol and ethical committee for approval and necessary permission was taken.

Sample size was twenty five blocks of histologically proven normal and Intraductal carcinoma of mammary gland, normal and adenocarcinoma of endocervical glands. The tissues were fixed in 10% formal saline with 2% calcium acetate and a pinch of phosphotungstic acid to help for preservation of mucins. The tissues embedded in paraffin blocks were prepared by histopathological technique and cut at 5 – 6 microns. Sections were stained with Hematoxylin and Eosin for identification of the tissue and special stain PAS for identification of carbohydrates and results were interpreted. PAS-Periodic acid Schiff reagent stains all carbohydrates including mucosubstances. Therefore mucosubstances are PAS positive. All the results obtained were tabulated according to colour intensity into different grades ranging from + to ++++. 

Observations and Results
All the results were tabulated according to colour intensity into different grades ranging from + to ++++. 

Colour Index:

++++ : Very strong positive reaction.
+++ : Strong positive reaction.
++ : Moderate reaction.
+ : Weak reaction.
- : Negative reaction.

Table Showing Histochemical result for PAS stain.

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Tissue stained</th>
<th>Result</th>
<th>Inference about Mucosubstances</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Normal endocervical glands</td>
<td>+++</td>
<td>PAS +vesubstances like carbohydrate &amp; mucins present.</td>
</tr>
<tr>
<td>2</td>
<td>Adenocarcinoma endocervical glands</td>
<td>++</td>
<td>PAS +ve Substances Present</td>
</tr>
<tr>
<td>3</td>
<td>Normal mammary gland</td>
<td>++ (Duct cells, Duct lumen, Lobule cells and Lobule lumen)</td>
<td>PAS +ve Substances Present</td>
</tr>
<tr>
<td>4</td>
<td>Intraductal carcinoma breast</td>
<td>++</td>
<td>PAS positive mucosubstances present.</td>
</tr>
</tbody>
</table>
Inference: Regarding special stains – PAS stain was used to assess presence of neutral mucosubstances. PAS stain for normal endocervix gave magenta colour with strong reactivity suggestive of presence of netural mucin. Epithelium and glands, both gave moderate to strong reactivity. PAS stain for adenocarcinoma cervix gave mild reaction as focal magenta staining, suggestive of presence of minimal neutral mucosubstances as compared to normal endocervix.

Sections of normal mammary gland stained with PAS showed the ducts and lobules stained magenta, confirming the presence of PAS positive substances like carbohydrate and neutral mucins. For Intraductal carcinoma breast, PAS stain gave moderate reaction as focal magenta staining, suggestive of presence of neutral mucosubstances. However the colour intensity was more than that of normal breast tissue.

Discussion

Worldwide, cervical cancer is the fifth most deadly cancer in women. It affects about 16 per 100,000 women per year. It accounts for 20-25% of all the cancers and 85% of all the female genital tract malignancies. Primary adenocarcinomas make 5-10% of all cancers of the cervix. Invasive breast cancer is the most common carcinoma in women, accounting for 23% of all cancers in women globally and now the most common cancer in Indian women, having recently overtaken cervical cancer in this respect.

The term “mucosubstances” is used to denote all tissue components, other than glycogen, rich in carbohydrates which are present in connective tissue or as secretion of certain epithelial structures by Spicer et al.

Numerous types of mucins occur depending on the
Examples of connective tissue mucins are chondroitin sulphate, heparin sulphate, keratin sulphate and hyaluronic acid. Epithelial mucins may be neutral or acidic. Neutral mucins are hexosamine units which may be associated with glucoronic or sialic acid; the reactive group being carboxyl. In sulphated mucins this group is blocked by a sulphate group which becomes the active group. Strongly sulphated mucins are of connective tissue type; the weakly sulphated groups are of epithelial type. The non-sulphated mucins are sialic acid and hyaluronic acid (carboxylated D-glucoronic acid). These can be enzymatically digested, though enzyme resistant forms do occur.

With the development of new histochemical method by special stains, specific chemical composition of mucosubstances is documented by various scientists. But there have been very few studies on human endocervical mucosubstances such as by J. N. Bulmer et al (1988), Vatsala Misra et al (1997), Zhao Shumei et al (2003) and Hayashi, Isamu M.T et al (2003) in the histochemical study of normal and adenocarcinoma of endocervix gland. In the histochemical study of normal and neoplastic breast, the present study correlates well with workers, Luciano Ozzello and Speer (1958), D J Cooper (1974), Muaz Osman Fagare (2015) and S S.Spicer et al (2016). The PAS reaction is an useful indicator of the presence of tissue carbohydrates, and particularly so for glycogen when the technique incorporates a diastase digestion stage.

**Summary and Conclusion**

Mucin histochemistry of normal and malignant endocervical glands, normal and Intraductal carcinoma of breast was undertaken in the department of Anatomy at Krishna Institute of Medical Sciences University, Karad from 2010 to 2018.

In the present study, Haematoxylin and Eosin was used as routine stain for identification and confirmation of the tissue and special staining with PAS was carried out for presence of carbohydrates.

- In the present study mucin histochemistry of normal endocervical glands showed mixture of mucosubstances, both neutral and acidic.
- Histochemical results for malignant endocervical glands showed very few mucins. Mixture of both neutral and acidic were found. Neutral mucins were in trace amounts. So there is a shift in mucin pattern as compared to normal.
- Mucin histochemistry of normal breast tissue showed that neutral as well as acidic mucins were present.
- Histochemical results for IDC breast showed a mixture of both neutral as well as acidic mucins, with predominance of neutral mucins.

**Ethical Clearance:** Institutional Ethics Committee KIMS “Deemed to be University”, Karad.

**Source of Funding:** Institutional Ethics Committee KIMS “Deemed to be University”, Karad.

**Conflict of Interest:** None.

**References**


18. JV Bulmer, N.R. Griffin, RE-Kingston, M Wells. Minimal Deviation Adenocarcinoma (adenoma malignum) of the endocervix; A histochemical and immunohistochemical study of 2 cases (Nov 1988) Gynecol Oncol. –Volume 36, Issue 1, January 1990, Pages 139–146


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Abstract

Wine is called as a functional fermented food as it shows several health benefits. This fermented undistilled alcoholic beverage is produced by anaerobic fermentation of grape sugars to ethanol by the wine yeast. In this study, roselle (*Hibiscus sabdariffa*) and peppermint (*Mentha piperita* L.) extract were used for making the wine along with main ingredients to obtain nine variations of wine. All the ingredients are best known for their medicinal and nutritional benefits. Baker’s yeast (*Saccharomyces cerevisiae*) was used for the fermentation process. Each variation along with the standard red wine (control) was fermented for 28 days. Characterization properties like pH and Total Soluble Solids were measured and observed weekly. After 28 days, sensory evaluation was conducted for the developed variations. The results showed that the variations with 10% of roselle were found to be the most accepted and amongst them, red wine with 10% roselle and 6% of peppermint extract (V2T3) was the best selected one by sensory panelists. The final products for all the variations and control were tested to measure their pH, specific gravity, alcohol content and vitamin C. The pH, specific gravity and alcohol by volume (%) of the most accepted variation (V2T3) were 2.96, 1.006 and 10.73% respectively. The results indicate developed red wine was accepted by the panelists.

Keywords: Fermentation; Sensory; Roselle; Peppermint; Wine.

Introduction

Grapes have been widely used as a prime raw ingredient for production of making wines over a long period of time. Traditionally, red wine is produced from grape varieties that have black or red color and the fermentation is carried out on the skin using standard wine yeast. Despite that, studies have investigated the suitability of other fruits, vegetables, edible flowers or combination of two or more substrates can be used to produce wine for example mango wine, roselle wine, banana wine etc. Edible flowers have traditionally been used in different cultures, such as European and Asian, to improve the appearance (colour, odor and flavour) and nutritional value of food. Flowers are served as a salad, as a snack and as a side dish. For example, roselle, otherwise called Indian sorrel belongs to the *Malvaceaeae* family and develops in the tropic and sub-tropical locales of the world. It is an erect, extended sub-woody yearly bush that bears alternate leaves and blooms that are borne with leafy large calyces. It is popularly recognized as ‘mesta’ or ‘chukur’ in Indian subcontinent including Bangladesh. Roselle calyces are palatable and the traditional use of roselle calyces (fresh or dried) extends from its use in remedies for various diseases to food uses such as sauce or filling for tarts or pies; and also to jam, jelly, syrup, wine, ice cream and flavours. The nutritional composition of fresh calyces varies from study to study, probably due to various varieties, genetic, environmental, and ecological and plant harvesting. In early studies, protein (1.9 g/100 g), fat (0.1 g/100 g), carbohydrate (12.3 g/100 g) and fiber (2.3 g/100 g) were reported. They are rich in vitamin C (14 mg/100 g), calcium (1.72 mg/100 g), beta carotene (300 μg/100 g) and iron (57 mg/100 g) [1]. Peppermint or mint (*Mentha piperita* L.), a perennial aromatic herb belonging to the *Lamiaceae (Labiatae)* family, is
a natural hybrid between spearmint (*Mentha spicata* L.) and water mint (*Mentha aquatic* L.). Fortification of wines is common but doing the same to improve its beneficial health properties is still less explored. A study has been done where orange wines were fortified with herbal extracts like holybasil, lemon-grass, peppermint and ginger were chosen which are known for therapeutic and medicinal applications. These herbal extracts impart their beneficial properties to the fortified wines and hence, consumption of such fortified wines would give tremendous health benefits than regular wines [2].

**Materials and Method**

**Sample collection and preparation:** Fresh grapes were purchased, destemmed, soaked in warm water and salt (NaCl) for 10 minutes, washed with clean water, dried in a clean muslin cloth and sorted. Grapes were weighed accurately and crushed and mashed by a clean wooden muddler in a clean and dry vessel. Dried Roselle petals were purchased from market and weighed accurately according to the calculated concentration of the respected variation and it is crushed and mashed along with the grapes nicely with the help of the muddler. Sugar (75g) and sterilized warm water (500ml) were added to the mixtures after this. Thus the total soluble solids (TSS) of the mashes were adjusted.

**Table 1. Composition of variations**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Grapes (kg)</th>
<th>Roselle (%)</th>
<th>Peppermint extract (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0 (Standard)</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>V1T1</td>
<td>1</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>V1T2</td>
<td>1</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>V1T3</td>
<td>1</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>V2T1</td>
<td>1</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>V2T2</td>
<td>1</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>V2T3</td>
<td>1</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>V3T1</td>
<td>1</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>V3T2</td>
<td>1</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>V3T3</td>
<td>1</td>
<td>15</td>
<td>6</td>
</tr>
</tbody>
</table>

Before inoculation, Potassium metabisulfite was added in the mashes to reduce the bacterial contamination. Commercially available baker’s yeast (*Saccharomyces cerevisiae*) suspension (1g/l) is added to it and mixed well. The wine must was filled into sterilized fermentation jars and sealed airtight and left to incubate for 28 days at room temperature. After 28 days the filtration was done of each variation and the amount of extract obtained from each variation was measured by measuring cylinder. Peppermint extract was made from fresh peppermint leaves which were purchased from the market and destemmed, soaked in warm water and salt for 5 minutes, washed with clean water, dried in a clean muslin cloth and sorted. For each variation apart from control, around 10 gm leaves were measured and taken for crushing. The leaves were crushed uniformly by adding water. Afterward, it was added to 200 ml distilled water and boiled. It was separated with the assistance of filter paper. The extract was thus prepared and could now be included. The extract was made just before adding to wine to guarantee it was included when fresh.

**Pasteurization and bottling:** The clear wine was transferred into covered steel pots and pasteurized by heating to 70°C for 15 minutes and cooled to room temperature (25°C). No chemical was added for the clarification of wines. Cold wines were filled into pre-sterilized bottles and kept in room until needed for further analysis.

**Determination of the physiochemical properties:**

*Determination of pH and total soluble solids (TSS), specific gravity (SG) and alcohol by volume % (ABV%):* The pH and TSS were measured according to the AOAC method[3]. Specific gravity (SG) of different wine versions was determined according to the procedure of Balogu and Towobola, 2017[4] and ABV% was then calculated based on specific gravity chart given by American Society for Brewing Chemists [5].

**Sensory evaluation:** Each panelist received the wine sample in a random presentation order, a glass of water for rinsing consumption between samples. Coded samples were assessed organoleptically using a 9-point hedonic scale.

**Results and Discussions**

**Physicochemical Properties:** *pH:* The pH of wine is important to know as it plays a critical role in many aspects of wine making, in particular wine stability. pH influences microbiological stability, influences the solubility of proteins and affects red wine colour and oxidative and browning reactions. Table 2 shows the weekly data of the pH for developed wines and it was observed that the wines are on acidic side (below 7) and in the variations the pH ranges from 2.8-3. The significant trend which was observes here was the pH was decreasing gradually throughout the fermentation.
period. Due to the low pH values, the wines gave a crisp tart taste to the product and it also enhances the microbial resistance of the product. The values are comparable with the pH values on the final day were 3.0 and 3.07 at 20 °C and 30 °C respectively in roselle wine [6]. The pH of 3 varieties of Zobo drink ranges from 2.5-2.67 [7].

<table>
<thead>
<tr>
<th>Table 2. Weekly pH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product Code</strong></td>
</tr>
<tr>
<td>T0</td>
</tr>
<tr>
<td>V1T1</td>
</tr>
<tr>
<td>V1T2</td>
</tr>
<tr>
<td>V1T3</td>
</tr>
<tr>
<td>V2T1</td>
</tr>
<tr>
<td>V2T2</td>
</tr>
<tr>
<td>V2T3</td>
</tr>
<tr>
<td>V3T1</td>
</tr>
<tr>
<td>V3T2</td>
</tr>
<tr>
<td>V3T3</td>
</tr>
</tbody>
</table>

**Total soluble solids (°Brix):** TSS measures the sugar content of present in the wine. This is measured using a refractometer, and is referred to as the degrees Brix (°). This influences the conversion of sugar to alcohol by yeast strain during fermentation period.

<table>
<thead>
<tr>
<th>Table 3. Initial and final TSS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product Code</strong></td>
</tr>
<tr>
<td>T0</td>
</tr>
<tr>
<td>V1T1</td>
</tr>
<tr>
<td>V1T2</td>
</tr>
<tr>
<td>V1T3</td>
</tr>
<tr>
<td>V2T1</td>
</tr>
<tr>
<td>V2T2</td>
</tr>
<tr>
<td>V2T3</td>
</tr>
<tr>
<td>V3T1</td>
</tr>
<tr>
<td>V3T2</td>
</tr>
<tr>
<td>V3T3</td>
</tr>
</tbody>
</table>

Table 3 shows the initial and final total soluble solids (TSS) of the developed wines. The initial brix(°) of the wines were to check the total soluble solids present in the wine musts before fermentation. The standard (T0) showed the highest initial brix of 21.54 followed by variation 3, variation 2 and variation 1. The final TSS of the wines has come down drastically in the final wines. The addition of sugar at the beginning of fermentation is necessary to provide suitable conditions for the growth of yeast and fermenting the sugar into ethanol [8].

**Specific gravity and Alcohol by Volume % (ABV%):** Table 4 shows the data for specific gravity (SG) of the developed wines. Final specific gravity is observed to be on a lower side than the initial specific gravity which is taken from the initial wine must. There is no significant trend observed in the specific gravity of wine. The standard wine had the highest initial SG of 1.09 amongst all the developed products, followed by variation 3 (1.087), variation 2 (1.085) and variation 1 (1.08). Thetable also depicts alcohol by volume % (ABV %) of the developed wines. The standard (T0) has showed to obtain the highest % of alcohol by volume % (ABV %) having an ABV of 11.27% which is almost near to the variations V3T2 (11.005%) and V3T3 (11.14%). This value is comparable with the wine produced from a blend of pawpaw and roselle extracts with a value of 10.5% (w/v) alcohol [9].
Table 4. Specific gravity and Alcohol by Volume % (ABV %)

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Initial Specific Gravity</th>
<th>Final Specific Gravity</th>
<th>ABV%</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0</td>
<td>1.09</td>
<td>1.007</td>
<td>11.27717</td>
</tr>
<tr>
<td>V1T1</td>
<td>1.08</td>
<td>1.006</td>
<td>10.05435</td>
</tr>
<tr>
<td>V1T2</td>
<td>1.08</td>
<td>1.006</td>
<td>10.05435</td>
</tr>
<tr>
<td>V1T3</td>
<td>1.08</td>
<td>1.005</td>
<td>10.19022</td>
</tr>
<tr>
<td>V2T1</td>
<td>1.085</td>
<td>1.007</td>
<td>10.59783</td>
</tr>
<tr>
<td>V2T2</td>
<td>1.085</td>
<td>1.006</td>
<td>10.7337</td>
</tr>
<tr>
<td>V2T3</td>
<td>1.085</td>
<td>1.006</td>
<td>10.7337</td>
</tr>
<tr>
<td>V3T1</td>
<td>1.087</td>
<td>1.007</td>
<td>10.86957</td>
</tr>
<tr>
<td>V3T2</td>
<td>1.087</td>
<td>1.006</td>
<td>11.00543</td>
</tr>
<tr>
<td>V3T3</td>
<td>1.087</td>
<td>1.005</td>
<td>11.1413</td>
</tr>
</tbody>
</table>

Sensory score analysis: Table 5 depicts the product wise mean sensory scores. While considering the mean sensory score with respect to taste, the highest score (8.04 ± 0.94) was obtained by V2T3, followed by standard (T0) which obtains a mean score of 7.48 ± 1.64. V3T2 got the minimum mean score with respect to aroma (4.60 ± 1.26). The statistical f-test indicates that the mean sensory scores with respect to aroma were found to be statistically significant at 5% level (p<0.05, 20.64*). While considering the mean sensory score with respect to mouthfeel, the highest score (8.12 ± 0.83) was obtained by V2T3, followed by standard (T0) which obtains a mean score of 7.44 ± 1.53. V1T1 got the minimum mean score with respect to mouthfeel (4.04 ± 1.48).

Table 5. Product wise mean sensory score

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Aroma</th>
<th>Taste</th>
<th>Mouth feel</th>
<th>Colour &amp; Appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0</td>
<td>7.20 ± 1.58</td>
<td>7.48 ± 1.64</td>
<td>7.44 ± 1.53</td>
<td>7.84 ± 1.18</td>
</tr>
<tr>
<td>V1T1</td>
<td>6.32 ± 1.15</td>
<td>5.48 ± 1.50</td>
<td>4.04 ± 1.48</td>
<td>7.08 ± 1.22</td>
</tr>
<tr>
<td>V1T2</td>
<td>6.24 ± 1.09</td>
<td>5.96 ± 1.51</td>
<td>5.88 ± 1.04</td>
<td>7.12 ± 0.93</td>
</tr>
<tr>
<td>V1T3</td>
<td>6.12 ± 1.05</td>
<td>5.84 ± 1.11</td>
<td>5.68 ± 1.31</td>
<td>6.84 ± 1.28</td>
</tr>
<tr>
<td>V2T1</td>
<td>6.76 ± 1.30</td>
<td>6.96 ± 1.27</td>
<td>6.84 ± 1.03</td>
<td>7.60 ± 0.76</td>
</tr>
<tr>
<td>V2T2</td>
<td>7.04 ± 1.10</td>
<td>7.08 ± 1.19</td>
<td>7.00 ± 1.08</td>
<td>7.68 ± 0.69</td>
</tr>
<tr>
<td>V2T3</td>
<td>7.88 ± 1.01</td>
<td>8.04 ± 0.94</td>
<td>8.12 ± 0.83</td>
<td>8.24 ± 0.93</td>
</tr>
<tr>
<td>V3T1</td>
<td>5.60 ± 1.63</td>
<td>4.68 ± 1.35</td>
<td>4.72 ± 1.49</td>
<td>6.88 ± 1.59</td>
</tr>
<tr>
<td>V3T2</td>
<td>5.68 ± 1.41</td>
<td>4.60 ± 1.26</td>
<td>4.56 ± 1.45</td>
<td>6.84 ± 1.21</td>
</tr>
<tr>
<td>V3T3</td>
<td>5.68 ± 1.41</td>
<td>5.00 ± 1.47</td>
<td>4.88 ± 1.51</td>
<td>6.88 ± 1.13</td>
</tr>
<tr>
<td>F-Test</td>
<td>8.56*</td>
<td>20.64*</td>
<td>22.35*</td>
<td>5.01*</td>
</tr>
<tr>
<td>SEM±</td>
<td>0.2585</td>
<td>0.2676</td>
<td>0.2592</td>
<td>0.2245</td>
</tr>
<tr>
<td>CD at 5%</td>
<td>0.7166</td>
<td>0.7418</td>
<td>0.7185</td>
<td>0.6223</td>
</tr>
</tbody>
</table>

*Significant at 5 % Level, SEM: Standard Errors of mean, CD: Critical Difference
The statistical f-test indicates that the mean sensory scores with respect to aroma were found to be statistically significant at 5% level (p<0.05, 22.35*). While considering the mean sensory score with respect to colour and appearance, the highest score (8.24 ± 0.93) was obtained by V2T3, followed by standard (T0) which obtains a mean score of 7.84 ± 1.18. V1T3 and V3T2 got the minimum mean score with respect to colour and appearance (6.84 ± 1.28 and 6.84 ± 1.21). The statistical f-test indicates that the mean sensory scores with respect to aroma were found to be statistically significant at 5% level (p<0.05, 5.01*).

Appearance, colour, aroma, taste and subtle taste factors like flavour of wine constitute the quality. Aroma and taste of wines are very complex and depend on number of factors such as cultivar, vinification practices, fermentation and maturation[10].

Table 6. Sensory score of overall acceptance

<table>
<thead>
<tr>
<th>Products</th>
<th>Overall Acceptability Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>T0</td>
<td>7.512</td>
</tr>
<tr>
<td>V1T1</td>
<td>6.124</td>
</tr>
<tr>
<td>V1T2</td>
<td>6.260</td>
</tr>
<tr>
<td>V1T3</td>
<td>6.140</td>
</tr>
<tr>
<td>V2T1</td>
<td>7.064</td>
</tr>
<tr>
<td>V2T2</td>
<td>7.220</td>
</tr>
<tr>
<td>V2T3</td>
<td>8.092</td>
</tr>
<tr>
<td>V3T1</td>
<td>5.492</td>
</tr>
<tr>
<td>V3T2</td>
<td>5.444</td>
</tr>
<tr>
<td>V3T3</td>
<td>5.628</td>
</tr>
<tr>
<td>F-Test</td>
<td>20.30*</td>
</tr>
<tr>
<td>SEm±</td>
<td>0.2040</td>
</tr>
<tr>
<td>CD at 5%</td>
<td>0.5655</td>
</tr>
</tbody>
</table>

*Significant at 5 % Level, SEm: Standard Errors of mean, CD: Critical Difference

The table 6 depicts the overall mean acceptability scores with respect to the products. The findings show that the highest overall mean acceptability score was found to be higher in V2T3 (8.092±0.84), followed by T0 (7.512±1.38). However, the least accepted product with minimum mean sensory score was found to be V3T2 (5.444±0.90). The data subjected for statistical tests reveals the difference in overall acceptability. The scores between products were found to be statistically significant at 5% level (p<0.05, 20.30*).

From the sensory scores it can be concluded that V2T3 was the best acceptable variation in all the attributes and panelists liked the product more than the standard (T0). The bitterness imparted by the 10% roselle in the product was well balanced by the addition of 6% peppermint extract with its cooling effect. In variation 1 the proportion of 5% roselle, grapes and peppermint extract was not well balanced which made the product less acceptable to the panelists and in variation 3 use of 15% roselle in the product showed reduced acceptance by the panelists as it imparted bitterness which made the variation unacceptable.

**Conclusion**

There are plenty of fruits, vegetables and edible flowers which are still underutilized though they can show positive health effects when consumed as it contains plenty of vitamins, minerals and also shows antioxidative properties. This study proves that acceptable wines can be prepared by addition of roselle and peppermint extract in the normal red wines if added in specific amount. The high acidity of the wines indicated that microbial spoilage resistance and storability can be improved when roselle is added to wine. Further studies are needed to check the proximate analysis and mineral compositions of wine and also to check the parameters of the wine when aged for a longer time.

**Ethical Clearance:** Passed through internal research committee

**Source of Funding:** Self

**Conflict of Interest:** Nil

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Analysis of Injury Pattern & Forensic Medicine Management in a Case of Bomb Blast Injury

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Abstract

Background: In 2016 midnight of summer a bomb blast occurred at ammunition depot Pulgaon. Blast was so severe that villagers in the radius of 10km witnessed the blast wave. It had killed 19 people which included Army officers, soldier & fire brigade men. As per police inquest & alleged history given by eyewitness, an authority of Central Ammunition Depot at Pulgaon noticed fire at ammunition store of the depot. For this reason emergency task force team of the depot got activated and few army personnel including fire brigade personnel rushed to the spot to control the fire. But unfortunately large amount of ammunition blasted suddenly as the fire spread inside the ammunition storage. Because of this 19 parsons were died on the spot & many were injured. To tackle the disaster civil authority were informed. When it was noted that total 19 personnel were died in the mishap, the District civil authority approached to Mahatma Gandhi Institute of Medical Sciences, Sevagram to send forensic medicine expert team to do spot Post Mortem (PM) examination. The main challenge before the forensic team was to establish the identity of the unidentified body apart from doing PM examination, so that the body can be handed over the kin as early as possible to end the uncertainty of their loved ones.

Aims & Objective: Forensic casework was carried out with aim to study the pattern of injuries in the bomb blast cases, and to assess forensic management done in mass disaster.

Material and Method: Study was carried out on 15 dead bodies involved in the bomb blast injury. It includes observation based on post mortem examination and assessment of forensic management done by our team.

Result: Bomb blast injury includes complex of injuries like burn injury(100%), decapitation (33%), injury of internal abdominal organs (40%) & chest organs (80%), fracture of bones (46%), Amputation of limbs (33%), and external mechanical injuries like contusion, abrasions and lacerations (100%). Due to destructive injuries identity of the victim gets obscured (40%).

Conclusion: Medicolegal postmortem, sample preservation and humanitarian action of establishing the identity of victims are the forensic management in bomb blast injury.

Keywords: Bomb blast, Mass disaster, Forensic Humanitarian action.

Introduction

Bomb blast is a kind of mass disaster. The WHO has defined disaster as an occurrence that causes damage, ecological disruption, loss of human life and deterioration of health and health services on a scale sufficient to warrant an extraordinary response from outside the affected community. A “Mass Disaster”
is considered to have occurred when the number of casualties occurring in a single event exceeds twelve\(^1\). Management of disaster is multifaceted. It includes involvement of various agencies like law enforcement, safety & Health care services. Forensic medicine role in the mass disaster includes

1) To retrieve and reconstruct bodies and fragmented bodies decently. 2) To establish personal identity. 3) To conduct autopsies on some or all of these bodies. 4) To establish the cause of death in same or all.

Apart from the routine forensic work forensic experts also has Humanitarian character in their task. This is known ‘humanitarian forensic action’\(^2\). Mass disaster is not uncommon in India. Hence preparedness should be there for such action. \(^3\). Present study involves handling of Bomb blast case by forensic expert.

**Aims & Objectives:** Forensic casework was carried out with aim to study the pattern of injuries in the bomb blast cases, and to assess forensic management done in mass disaster.

**Material and Method**

Mass casualty due to bomb blast occurred at Army Ammunition depot in summer 2016. Present study was cross-sectional in design and included deceased succumbed to blast injuries. Total 19 casualties were reported. Post mortem examination was conducted on 15 bodies out of total 19 bodies. 4 bodies were referred to another agency for administrative purpose, and are excluded from present study. Each team consists of one forensic expert, one junior resident & one mortuary attendant. Total 4 teams were formulated by MGIMS, Sevagram. Police officials collected the bodies and body parts which were submitted for postmortem examination. Bodies were categorised in two parts i.e. 1) Deceased of which facial structured was intact and identity could be established and 2) Deceased wherein identity from facial features was not established due to its complete destruction.

Injuries were noted by proper examination of the dead body and samples are preserved in order to establish identity of unidentified bodies. Cause & manner of the death of each person was determined based on observed trauma. Pattern of the injury is analyzed by comparing the existing injuries with the data from available literature. Standard Disaster Victim Identification (DVI) protocol\(^4\) was employed like visual identification, identification by interviews of next of kin and peer group and DNA analysis. Data was compiled and analysed with regards to trauma pattern and identification techniques involved.

**Observation:** Significant trauma was observed in almost all of the dead bodies with multiple body regions were involved. All the body areas had external mechanical injuries like abrasion, lacerations, contusions of various sizes and severity. Various major injuries observed amongst the bodies were as under.

**Burn Injury:** All 15 bodies have burn injuries these varied in extent and depth. Burn varies from superficial burn to complete charring of the body. (Fig.1). Inmost of the cases the blast had ripped off the clothing. Out of 15 bodies only 2 bodies was having minimal burn (up to 10%) & rest all of the cases were having severe burn injury starting from more than 50% to complete charring.

**Head & Neck Injuries:** 13 out of 15 (86%) of the victims had head & neck injury. Out of these 13 cases 5 cases had decapitation. (Fig 2 & 3). In remaining 8 cases, skull bone was fractured. The fracture skull varied from small fractures involving the base of the skull to major fractures of the vault. Decapitation injury ranged from level of lower jaw to transaction at the level of nipple in chest (1 case Fig.3). Brain injury involves laceration, oozing of brain matter & intracranial hemorrhages which included extradural, subdural and subarachnoid hemorrhages.

**Upper Trunk Injury (Thoracic Injury):** Injuries on the upper trunk involve external injuries such as pressure abrasion, abrasions, contusions, laceration in almost all the cases. Most of the bodies were having both external as well as internal trauma of chest. In 12 out of 15 cases (80%) internal chest trauma was present which included various injuries like hemotherax, hemorrhages, contusions & lacerations of lungs. Hemocardium, contusions & lacerations of heart was also appreciated. In 3 out of total 15 (20%) cases chest cavity was opened and charring of internal organs took place.

**Lower Trunk (Abdominal Injury):** Injuries on the lower trunk varied from external injuries such as pressure abrasion, abrasions, contusions, laceration in almost all the cases. 6 out of 15 cases (40%) show intrabdominal trauma which include hemorrhages in abdominal cavity, contusions & lacerations of abdominal organs. In 3 cases (20%) abdominal cavity was opened and viscera were charred.
Limb injury: Almost all the bodies had various kinds of injuries on limb varied from external mechanical injury such as abrasion, laceration, and contusions, fracture of bones or amputation of the limbs. Fracture of limbs was seen in 7 out of 15 (47%) bodies out of these 5 (33% of total) bodies had amputation of the limb.

Identification data: As all the deceased were serving personnel of the Ammunition Depot, list of missing personnel was provided by Depot Authority as they were deployed as a fire fighting team. 9 out of total 15 (60%) persons were identified by facial features and body was handed over to relative after post mortem examination. Body was first identified by Depot authority and later on by relatives of the deceased. In 6 bodies (40%) identity from facial structures could not be made out as body had decapitation injury as described earlier or their facial features unable to makeout due to extensive trauma. Among these 6 bodies, identity card of the deceased was found in two bodies (fig. 4). Still to confirm the identity of these bodies, sample was taken for DNA Analysis. Sample taken were blood on cotton cloth, the cloth was air dried and sealed in paper envelope. Sternal bones along with ribs were taken from all the 6 bodies for DNA analysis. On same day blood sample from parents of the missing persons was taken for matching the DNA profile with unidentified bodies. All samples are immediately forwarded to Regional Forensic Science Laboratory, Nagpur (RFSL). DNA analysis report was received within 48 hours and bodies handed over to relative by the police authority

To establish the identity following stepwise measures were taken.

1. Duty roster from the ammunition depot authority was taken.
2. Number of the missing personnel was identified by taking the roll call by the depot authority.
3. Relatives of the all missing personnel informed regarding the incident and they all were called at the site for identification of the bodies.
4. Depot officer and relatives of the deceased identified 9 bodies whose facial structure was intact.
5. To confirm the identity by DNA fingerprinting sternal bone & rib bones were preserved; blood was taken on cotton cloth. All these sample air dried and handed over to police as per norms.
6. Regional forensic lab, Nagpur was contacted by police authority and they were agreed to do DNA analysis within 2 days. Blood samples from the relatives were taken for the matching.
7. After the result of DNA analysis identity of all the deceased is established and bodies were handed over to police for further handover to relatives.
Discussion

Burn Injuries are commonly observed in blast injury. As per study by Water worthTA\textsuperscript{5} 19 out of 21 (90%) victims was having burn injury. In present study all 15 cases (100%) were having burnt injury. In study T A water worth most of the burn injury was superficial type but some injury were more extensive and charring of the tissue occurred due to flash. In present study also the burn pattern varies from superficial to deep and charring observed. However number of cases involved more in our study as large amount of ammunition store blasted at single time.

In the study by KahanaT\textsuperscript{6} 73 of 171 (43%) of cadaver is identified by visual method and in remaining cases scientific method are used for the identification before burial of the body. In our study, 9 cases out 15 (60%) had identified with facial characters. However to identify the unknown cases DNA analysis was performed. Differences in finding between these two studies may be due to less number of cases involved in current study and list of missing persons was known. However, the study done by water worth\textsuperscript{5} shows similarity with findings in our study pertaining to number of unidentified persons.

In present study 13 out of 15 (86%) cases suffered head, neck & face injury. This varied from skull fracture to complete decapitation of the head. Our findings matches with the study by T A Waterworth\textsuperscript{5} where 15 out 21 cases (70%) cases have the head injury in varying severity. However our findings differs with the study by Yogender Malik\textsuperscript{7} where 33% cases involved with injury at head region. This variation may be due to the variation in severity and amount of ammunition blast in these studies.

As per study of waterworth\textsuperscript{5} out of 21 bodies (43%) person suffered limb amputation. These findings are similar to our study where amputation of limb is seen in 5 cases (33%). Extremities injuries are one of the commonest involvements in bomb blast incident. In study by sue Mallonee\textsuperscript{8} .75% of the victims suffered with the limb injury. In our study all the (100%) victims were having various kinds of injuries on limbs ranging from abrasion, laceration, fracture to amputation of limbs. Fracture of the bone is noted in 7 out of 15 cases. (46%)

All the bodies were having external injuries over upper & lower trunk. In our study 12 (80%) individuals were having internal chest trauma that includes contusions & laceration of the lungs and hemorrhages in chest cavity & 3(20%) person were having open chest wound. 6 (40%) cases were having contusion and laceration of various abdominal organs out of which 3 (20%) bodies were having open abdominal wound. Similar finding was seen in study by waterworth\textsuperscript{5}.

Conclusion

Team work is must in mass disaster. It includes proper coordination between investigating agency, administration authority & medical team. In current case District authority advised for formation of medical team, the team examined the bodies and collected the proper samples, police agency done their inquest formalities quickly and liaised with RFSL for quick analysis of sample and due to this team work situation was handled on fast track.

Inclusion of forensic expert is must in this kind of situation. Due to involvement expert proper sample collection, their preservation, performing the autopsy and establishing the identity of unknown victim was done with great proficiency.
DNA typing allows the identification of individual, as long as sufficient DNA can be recovered from the sample(s). This is true even when the conditions are such that the victims’ remains are fragmented.

Regarding injury pattern complex nature of the injuries is present in case of bomb blast. Establishing the identity remains the main challenge due to severity of injury.

The common conception of forensic medicine is that they are involved with gathering evidence against crime. That is, they are focused on assignment of criminal responsibility. However, there has always been a humanitarian character to forensic medicine. ‘Managing the dead, including protecting their dignity but also helping to identify them to prevent and resolve the tragedy of people missing’ is the humanitarian forensic action is evident in present study.

**Conflict of Interest:** Nil

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**Ethical Clearance:** Taken from Institutional Ethical committee as per Institute Norms

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**References**

An Autopsy Study of Brought Dead Cases at a Tertiary Care Hospital in Port Blair, Andaman and Nicobar Islands

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Abstract

Introduction: Brought dead cases are considered as Medico-legal Cases which require investigation by law enforcing authorities, to know the cause of death and then decide whether it is a Natural/Unnatural death. The doctor’s post mortem report gives direction to the police in their investigation.

Method: All cases during the study period i.e. from 1st Jan 2019 up to 31st Dec 2019 were that were brought dead to GB Pant Hospital (GBPH), which is a tertiary care hospital attached to ANIIMS were included. All these cases were retrospectively analysed under various parameters.

Results: The present study reveals that out of 223 cases, 58 were brought dead to GBPH. Out of these in 57 cases the death was due to a Natural cause and in only one case it was due to an unnatural cause.

Keywords: MLC case, Medico-legal Case, Natural deaths, Unnatural deaths, Criminal Justice System, Brought Dead cases.

Introduction

After the birth of a person, death is sure and certain. This is the universal law of existence. Because of the complexities of life, factors like socio economic conditions, thoughts, habits, behaviours, physical and mental health- affect the life span of a person. Any death which is suspicious, and where there is some foul play, disturbs the peace of the family, community and ultimately the society.

Natural death means death occurring due to some natural disease or pathological condition, old age, or devitalisation; here the death is not intended or attempted and also does not occur accidentally⁽¹⁾. Deaths other than due to natural causes- Suicides, homicides, accidental deaths- are termed as ‘Unnatural Death’. This division of death into ‘natural’ and ‘unnatural death’ is very crucial for the police. Naturally, the police will need to investigate all the unnatural deaths to bring the case to a logical conclusion and thereby apprehend and punish the criminals and protect the innocents; thus maintaining law and order in the society and bring peace and prosperity.

Criminal Justice System comprises of the police, the judiciary and corrective system [prison department]. Although society maintains other forms of social control such as family, school, religious institutions, they are designed to deal with moral, and not legal mis-behaviour. Only Criminal Justice System has the power to control crime and punish criminals. And the doctor being in a responsible position in the society, shall support the system while discharging his duties.

The brought dead case or dead on arrival is such a situation that the attending doctor cannot certify whether it is natural death or unnatural death. If he satisfies himself, that it is due to some natural cause he will

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issue the death certificate and if he suspects some foul play, he will make it a medicolegal case and informs the police. Thereafter, the police will hold the inquest and if the investigation officer of the case, finds any suspicion in the causation of the death, he will send the body for medicolegal autopsy, during which the cause of death, time since death, manner of death – natural or unnatural are opined.

Therefore, the cases which are brought dead are routinely registered as medicolegal cases and police are informed and death certificate is not issued and the body is not released to the relatives\(^{(2)}\).

The present study is aimed to analyse the brought dead cases in terms of natural and unnatural; sex & age incidences; and the cause of death.

**Materials and Method**

In the present study we retrospectively assessed all cases that were brought dead to GB Pant Hospital. Relevant data was extracted from the Post-mortem reports. Out of the total 223 cases subjected to post mortem examination 58 were brought dead to GBPH Casualty department and tabulated into MS Office Excel Sheets and later tabulated using SPSS Version 21.

**A. Criteria for case selection**

1. Both male and female victims were taken into consideration
2. All age groups are included in the study
3. All types whether natural or un natural are included in the study

**B. Collection of data**

1. Inquest report of police- address, age, sex, religion, place, time and date of occurrence of death.
2. Previous history of the case- from the relatives/ friends/co-workers of the deceased.
3. Medical documents – old case sheets, medication history & date and time of declaration of death.
4. During autopsy- whether the findings corroborates with apparent cause of death or not. External and internal findings are considered.

### Results

**Figure1-Total Cases=223**

- **Brought Dead**: 26%
- **Others**: 74%
Figure 2 - Age wise distribution

Figure 3 - Sex wise Distribution of Cases
Table 1: Different causes of death— for natural deaths

<table>
<thead>
<tr>
<th>System</th>
<th>Total no of cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardio-vascular System (CVS)</td>
<td>22</td>
<td>37.58</td>
</tr>
<tr>
<td>Gastro-intestinal System (GIT) &amp; FSL reserved (GIT)</td>
<td>16</td>
<td>27.58</td>
</tr>
<tr>
<td></td>
<td>05</td>
<td>08.62</td>
</tr>
<tr>
<td>Respiratory System (RS)</td>
<td>09</td>
<td>15.51</td>
</tr>
<tr>
<td>Central Nervous System (CNS)</td>
<td>05</td>
<td>08.62</td>
</tr>
<tr>
<td>Infectious Disease</td>
<td>01</td>
<td>01.72</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>58</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Discussion and Analysis

In the present study (Figure 1) out of all 223 post mortem examination cases conducted at GBPH, 58 cases were brought dead to the Casualty Department of GBPH which is 26%. This closely correlates with the study conducted by N. L. Disania et al, who reported that 31.70% cases were brought dead and much higher than reported by B. D. Gupta et al who reported that 10.7% cases were brought dead. It is much lower than the study conducted by Apurba Biswas et al who reported 58.33% of all cases were reported brought dead. Age wise distribution (Figure 2) of the brought dead cases and reveals that, the number of brought dead cases in the extremes of age are less and age group of 51-60 has maximum number of deaths i.e. 25.86% (n=15), this differs from N. L. Disania et al who reported that age group of 3rd decade had maximum deaths 27.27%, while Gupta et al reported that 31-50 age group topped at 48.89%

Sex wise distribution (Figure 3) of the brought dead cases, reveals a male to female sex ratio of 4.88:1, while N. L. Disania et al reported 1:0.18; Gupta et al reported it at 5.92:1 and Apurba Biswas et al reported it at 4.40:1.

In this study (Figure 4) Natural Deaths were 98.27% (n=57) vs Unnatural Deaths is 1.72% (n=1). This differs from Disania et al, who reported Natural Deaths at 21.9% and Unnatural Deaths at 78.1% and Apurba Biswas et al who reported Natural Deaths at 9.76% and Unnatural Deaths at 88.92%.

Figure 5 depicts distribution of deaths due to CVS and GIT disease. In this study deaths due to cardiovascular deaths in females were prevalent only in the age group of 61-70 years (females 6; males only 1 n=7). Similarly deaths due to cardiovascular diseases in males was prevalent mostly in the age group 51-60 (n=7). Deaths due to GIT diseases were prevalent in males only.

Table 1 depicts different causes of natural deaths; the CVS contributes more numbers (n=22), followed by GIT (n=21) in which all deaths are due to chronic liver disease. Out of these in 5 cases, viscera has been sent for chemical analysis for the confirmation of alcohol these showed features of chronic liver disease also and therefore included in GIT category. All these cases had a history of chronic alcoholism. RS, CNS and Infectious disease (in this case it was Falciparum malaria which was proved by lab investigation).

Research shows that almost every system in the body can be influenced by chronic stress. When chronic stress goes unreleased, it supresses the body’s immune system and ultimately manifests as illness. Fight or flight is the response to the stress. During this time heart rate, blood pressure, breathing, muscle tension, digestion, metabolism will all increase. Normally it should return to normal within 3 minutes. But because of faulty conditioning, this will continue leading on to chronic stress. To combat stress, person will resort to alcohol or tobacco which both are in high prevalence in Andaman.

Coronary Heart disease has long been regarded as a classical psychosomatic illness. There is a strong evidence that psychological stress is a significant risk factor for coronary heart disease and mortality. Tennant found that a positive relationship between life stress and cardiac infarction and sudden death; while study by Rosengren et al reported that mortality was increased two folds for men for experiencing 3 or more antecedent life stressful events. The INTERHEART study revealed that people with myocardial infarction reported higher prevalence of 4 stress factors: stress at work and at home, financial stress and major life events in the past year.

Conclusion

The present study reveals that almost all the brought dead cases are Natural Deaths. Diseases of the cardiovascular system and gastrointestinal system are major contributors. With respect to GIT, all deaths are due to Alcoholic Liver Disease and all are males. Both tobacco and alcohol addiction being high in Andaman’s Port Blair are major contributors to these natural deaths.

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Conflict of Interest: Nil

Source of sponsorship or funds received: Nil

Ethical Clearance: Not required, as the study is retrospective and non-invasive.

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Efficacy of Neural Mobilization and Cervical Stabilization in Cervicobrachial Pain: A Randomized Controlled Trial

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Abstract

Objective: To analyze the efficacy of neural mobilization technique in cervicobrachial pain. To analyze the efficacy of cervical stabilization exercise in cervicobrachial pain

Background of the Study: Cervical radiculopathy is a pathological process of involving the cervical nerve root as a result of compression and inflammation of the nerve root near the cervical neural foramen. Cervicobrachial pain syndrome is term that describes pain and stiffness of the cervical spine with symptoms in the shoulder girdle and upper extremity.

Methodology: This was conducted in the Outpatients Physiotherapy department in ACS medical college and hospitals. Group A Received Neural mobilization technique and Group B Cervical stabilization exercise for 12 weeks. Pre and post-test taken by using primary outcome measure such as Pain DETECT Questionnaire, Disability of arm shoulder and hand DASH Questionnaire, Fear avoidance beliefs Questionnaire and cervical ROM.

Results: The comparison revealed that neural mobilization group A had a great increase in cervical range of motion flexion and extension (P ≤ 0.001), Decreasing pain intensity (P ≤ 0.001) and also shows significant decrease in the neural mobilization (P ≤ 0.001) than the cervical stabilization exercise. The significant difference between Group A seems to be more effective than Group B.

Keywords: Cervicobrachial pain, neural mobilization, cervical stabilization exercise, Fear avoidance beliefs questionnaire, Disability of arm, shoulder and hand dash.

Introduction

Cervicobrachial pain (CP) is defined as the presence of upper-quadrant pain associated with cervical spine pain. CP can therefore be referred to the arm from somatic structures or radiate to the upper limb through neuropathic mechanisms. Numerous classifications have been reported, including cervicobrachial pain syndrome, cervical radiculopathy and neck and arm pain. For this study, CP is defined as “the presence of arm pain associated with cervical spine pain” as described by Salt et al¹

Reddy et al states that Cervical spondylosis is a common degenerative condition of the cervical spine in the general population with incidence rate of 83 per 100,000 populations and prevalence of 3.3 cases per 1000 people and occurs mostly in fourth and fifth decades of life.²

Basson et al concludes that Neck pain is often associated with headache upper back and shoulder arm pain and cervical radiculopathy. Diagnosis of
cervicobrachial pain is made by a clinical process and there is often no overt neural involvement can be assumed if a cluster of clinical finding is present such as an active and passive movement dysfunction, adverse response to neurodynamic testing and evidence of local cause of neuropathic pain.3

Pierre Langevin et al states Cervical radiculopathy (CR) is an important subgroup of neck disorders. Although less prevalent than mechanical neck pain, CR leads to more severe pain and disability. In fact, individuals with combined axial and radicular symptoms have been shown to present higher functional limitations than those with either isolated axial or radicular pain.4

Schoenfeld AJ et al states Cervical radiculopathy was 107.3 per 100,000 for men and 63.5 per 100,000 for women. A more recent study from the US military found an incidence of 1.79 per 1000 person –year (50-54 years) the incidence of cervical radiculopathy seems to peak in the fourth and fifth decades in life.5

Levels of involvement is most typically the C7 (39.3%-46.3%) and C6 (17.6%- 42.6%) nerve roots. Bilateral involvement is reported in 5-36% of cases. The inter vertebral disc has been found to be causative in only 22% of cases, while 68% of cases appear to arise from a combination of discogenic and spondylotic causes. Cervical radiculopathy is one of the most health-related complaint. Cervical radiculopathy is common clinical diagnosis classified as a disorder of a nerve root and most often is a compression or inflammatory pathology from a space occupying lesion such as spondylotic spur, disc herniation as explained by Rajalaxmi et al.

Sharma et al states Neural mobilization can be used for both evaluation and treatment purposes, when it is used in the treatment; its main purpose is to reestablish the dynamic equilibrium of the neural tissues, normalizing its physiologic function. The nervous system can be effectively and safely mobilized, the ultimate aim of treatment is to restore the patient’s range of nervous system movement & stretch capabilities and to normalize the sensitivity of the system.6

Apoorva Sunil Likhite et al states the neurodynamic provocative tests used for the upper quadrant disorders, Upper Limb Neurodynamic Test 1 (ULNT-1) is reported to be evaluating most roots of brachial plexus and nerves of upper limb, with more emphasis on the median nerve.8

Rodriguez-Sanz D reports that The median nerve

neural mobilization (MNNM) and relieve CP, but through different mechanism and with a different onset of side effects MNNM is a specific physical therapy technique for the treatment of CP described by Butler, Coppieters, and Elvery –hall that achieves pain relief through mechanical stimulation of the median nerve and the brachial plexus.9

Jinyeol Jeon et al argues The recent therapeutic exercise there is increasing interest in, understanding the effect of cervical stabilizing exercise, not only to prevent neck disorder, but also reduce chronic cervical pain. These exercises induced cervical vertebra to maintain a neutral position by strengthening the deep muscles play a major role in maintaining spinal stability. Patient with cervical pain show reduced strength and endurance in deep muscles, as well as ability to retract the lower jaw compared to normal people, according to many studies. Moreover, there is a report there is report that stabilizing exercise is very effective at reduce chronic cervical pain and improving neck function.10

Gummesson et al reports The 30-items disabilities of the arm, shoulder and hand (DASH) questionnaire which has been assessed recording reliability, cross-sectional validity and longitudinal validity in a variety of arm disorders.11

Padua R et al states that The FABQ2 (Fear avoidance beliefs about physical activity) showed little or relationship with VAS (p = 0.26, p<0.001). The coefficient of r = 0.808 was estimated for the total questionnaire as an indicator of excellent reliability of the Persian FABQ.12,13

Sunnia Chandan et al reports that the pain DETECT questionnaire (PDQ) is one of the screening tools of neuropathic pain, which was published by Freynhagen et al., from Germany they established the usefulness and validity of this brief, self–administered questionnaire in identifying neuropathic components of pain in patients with chronic lower back pain.14 The use of these tools in different language and cultures could contribute to increase the recognition of neuropathic pain.15

**Materials and Method**

This was a comparative study with pre-post type. This was conducted in the Outpatients Physiotherapy department in ACS medical college and hospitals and took nearly 3 months to complete the study (January 2019-April 2019). 30 samples were selected from 40
volunteers based on the inclusion and exclusion criteria, Cervicobrachial pain of both gender aged between 30 to 60 years. Sufficient cooperation and to participate and able to communicate and follow the instructions and able to perform Neural mobilization and Cervical stabilization exercise according to Cervicogenic pain, Arm and hand pain, Neck distraction, Upper limp tension test, non-traumatic pain, Involved side cervical rotation less than 60 degree ROM and excluded those with Negative neurodynamic test, Neck and upper extremity surgery, Medical red flag suggesting a non-musculoskeletal origin, Vertebral instability, Vertebral spine infection, Neurological disease of genetic, infection, or neoplastic origin, Inflammatory or systemic disease, VBI symptoms, Rheumatoid arthritis.

Once the study gets approved from Institutional Review Board 30 samples were divided into two groups by random sampling method. The samples will be fully explained about the study and the questionnaire to be filled. They were then asked to fill the constant form it acceptance to participate in study, which is duly signed by the samples and therapist. Initially demographic details like age, gender, height, weight were collected assuring confidentiality of the same. Group A Received Neural mobilization technique and Group B Cervical stabilization exercises for 5 repetition/one sessions per day for 4 days a week for 12 weeks. Pre and post-test taken and before and after the study of 3 months, by using primary outcome measure such as Pain DETECT Questionnaire, Disability of arm shoulder and hand DASH Questionnaire, Fear avoidance beliefs Questionnaire and cervical ROM.

Data Analysis: The collected data were tabulated and analyzed using both descriptive and inferential statistics. All the parameters were assessed using statistical package for social science (SPSS) version 24. Paired t-test was adopted to find the statistical difference within the groups & Independent t-test (Student t-Test) was adopted to find statistical difference between the groups.

Demographic Data:

<table>
<thead>
<tr>
<th>Table-1</th>
<th>Group-A</th>
<th>Mean ± SD</th>
<th>Group-B</th>
<th>Mean ± SD</th>
</tr>
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<tbody>
<tr>
<td>Age</td>
<td>49.00 ± 9.77</td>
<td>51.33 ± 10.84</td>
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<tr>
<td>Height</td>
<td>159.24 ± 7.63</td>
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<tr>
<td>Weight</td>
<td>67.60 ± 12.96</td>
<td>73.80 ± 10.96</td>
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Table 2: Comparison of Dependent Variables within Group – A Between Pre & Post Test Values

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pre Test</th>
<th>Post Test</th>
<th>t - Test</th>
<th>Significance</th>
</tr>
</thead>
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<td>S.D</td>
<td>Mean</td>
<td>S.D</td>
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<tr>
<td>FABQ</td>
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<tr>
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<td>37.66</td>
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<tr>
<td>CROM (E)</td>
<td>21.66</td>
<td>4.08</td>
<td>38.66</td>
<td>5.16</td>
</tr>
</tbody>
</table>

(***- P ≤ 0.001)

Table 3 Comparison of Dependent Variables within Group – B Between Pre & Post Test Values

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pre Test</th>
<th>Post Test</th>
<th>t - Test</th>
<th>Significance</th>
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<td>S.D</td>
<td>Mean</td>
<td>S.D</td>
</tr>
<tr>
<td>DASH</td>
<td>75.93</td>
<td>5.48</td>
<td>71.66</td>
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<tr>
<td>FABQ</td>
<td>41.33</td>
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<tr>
<td>PDQ</td>
<td>28.06</td>
<td>2.71</td>
<td>25.06</td>
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<tr>
<td>CROM(F)</td>
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<td>29.00</td>
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<td>CROM(E)</td>
<td>22.33</td>
<td>4.16</td>
<td>29.66</td>
<td>3.99</td>
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</table>

(***- P ≤ 0.001)
Results

On comparing the Mean values of Group A & Group B on Disability Arm Shoulder and Hand Questionnaire Score, both the groups showed significant decrease in the post test Mean values but (Group A - Neural Mobilization) shows 49.86 which has the Lower Mean value is effective than (Group B -Cervical Stabilization Exercises) 71.66 at $P \leq 0.001$.

On comparing the Mean values of Group A & Group B on Fear Avoidance Belief Questionnaire Score, both the groups showed significant decrease in the post test Mean values but (Group A - Neural Mobilization) shows 21.23 which has the Lower Mean value is effective than (Group B -Cervical Stabilization Exercises) 37.73 at $P \leq 0.001$.

On comparing the Mean values of Group A & Group B on Pain Detecting Questionnaire Score, both the groups showed significant decrease in the post test Mean values but (Group A - Neural Mobilization) shows 17.00 which has the Lower Mean value is effective than (Group B -Cervical Stabilization Exercises) 25.06 at $P \leq 0.001$.

On comparing the Mean values of Group A & Group B on cervical range of motion (Flexion & Extension), both the groups showed significant increase in the post test Mean values but (Group A - Neural Mobilization) shows 37.6 & 38.6 degrees which has the Higher Mean value is effective than (Group B -Cervical Stabilization Exercises) 29.0 & 29.6 at $P \leq 0.001$.

On comparing Pre-test and Post-test within Group A & Group B on DASH,Fear Avoidance Belief Questionnaire, Pain Detecting Questionnaire and Cervical Range of Motion (Flexion & Extension) showed highly significant difference in Mean values at $P \leq 0.001$.

Discussion

The present study was concluded to determine the effectiveness of neural mobilization and cervical stabilization exercise in cervicobrachial pain. About 30 subjects were selected. The 30 subjects were selected into group A 15 and group B 15. Group A Received Neural mobilization technique and Group B Cervical stabilization exercise for 5 repetition/one sessions per day for 4 days a week for 12 weeks of treatment. It was noticed that there was improvement the above parameters in all the two groups. In many studies it has been proved that neural mobilization technique has the greater impact on decrease in pain, strengthening of muscle and increasing in range of motion.

The statistical reports reveal that there is no significant difference in pre-test values of PDQ, FABQ, DASH and GONIOMETER ROM score in group A and group B. But there is statistically highly significant difference in post-test values of PDQ, FABQ, DASH and GONIOMETER ROM score in group A and group B. Both the groups show significant decrease in the post test values group A is more effective than group B. this shows both groups are significant in reducing pain, increasing in range of motion in cervicobrachial pain but Group A (neural mobilization technique) is more significant when compared to group b (cervical stabilization exercise).

Neural mobilization is used to affect the neural structures in conditions with signs of neural involvement or neural mechano sensitivity. It is said to have an impact on the axoplasmic flow, movement of the nerve and its connective tissue, the circulation of the nerve by alteration of the pressure in the nervous system, Dispersion of the intraneural oedema and can also decrease the excitability of dorsal horn cells.

Anupama prabhu et al (2017)The study aimed at VT for median nerve was reduced for the intervention group and for ulnar nerve it was reduced in both the groups with the mobilization of the neural tissue, there could be a better reception and faster conduction of these impulses and hence, increase in sensitivity of the nerve and reduction in pressure.

Kikukawa et al (2003) reported that microtubules were depolymerized by stretching, which can affect axonal transport. When nerve fascicles are stretched, its cross-sectional area is reduced interfascicular pressure increase, nerve fibers are compressed and microcirculation is compromised and pressure received by nerve will affect the edema and demyelination.

Rajalaxmi Gopala Krishnan al (2015) Suggested that the patients who meet the diagnostic classification for cervical radiculopathy might benefit from a multimodal treatment that includes interferential therapy, neural mobilization and conventional therapy. Rather it involves all the surrounding nerves and tissues whereas neural tissue mobilization specifically targeted the neural structure involved.
The present study attempts to identify the efficacy of two active manual therapy techniques in case of subject with cervicobrachial pain syndrome. One technique followed the principles of neural mobilization technique by utilizing neural tissue mobilization for median and radial nerve and other technique focused on cervical stabilization exercise. The study revealed that each of the approach (neural tissue mobilization and cervical stabilization) resulted in overall improvement in disability and pain but the neural tissue mobilization is more effective than the cervical stabilization.

Conclusion

This study confirmed that neural mobilization technique had better carryover effect as compared to cervical stabilization exercise and also it showed steady improvement in the pain and disability so subjects showed much faster improvement. That neural tissue mobilization for median and radial nerve as a treatment technique is much more effective than cervical stabilization exercise, thus the neural mobilization technique is effective in regard to increasing function as well as active ROM, while decreasing level of cervicobrachial pain and disability.


Conflict of Interest: None

Source of Funding: Self funded

References


6. RajalaxmiGopalaKrishnan, Veena Krithika: to compare the effectiveness of interferential therapy with and without neural mobilization along with conventional therapy in cervical radiculopathy patients. International journal of physiotherapy and occupational therapy, June 2015, Vol 1, Issue 1, 64-75


A Study to Compare the Effectiveness of Sensorimotor Training and Balance Exercise in Subjects with Neck Pain

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Abstract

Aim: To compare the effectiveness of sensori-motor training and balance exercise in subjects with neck pain.

Background: Impaired cervical joint position sense, sensorimotor and balance are associated with neck pain. The presence of cervical musculoskeletal impairment was not specific to cervicogenic headache but was present in various recurrent headache types.

Methodology: This study was a comparative study design with pre and post type, 50 samples were selected based on the inclusion criteria. Group A received balance exercise and Group B received sensorimotor training. Both groups received exercises for 40 mins/session per day for 5 days a week for 12 weeks. Pre and post test measures taken using visual analogue scale, Ammer dizziness diagnostic scale, patient specific functional scale, Tinitee balance scale.

Result: On comparing the mean value of group A and group B on values, it shows significant difference between group A and group B. Group A Seems to be more effective than Group B.

Keywords: Neck pain, balance exercises, Sensorimotor.

Introduction

The neck pain is a common musculoskeletal disorder and a costly public health issue. The pain is often persistent or recurrent in nature. The underlying mechanisms for recurrence or persistence remain unclear but could be associated with altered proprioception from the neck muscles. Some patients usually have impaired proprioception and postural instability which account for these symptoms and the impairments can lead to decreased physical performance and increased concerns of falling, particularly the elderly. Dizziness and unsteadiness have been shown to be predictors of both poorer recovery and poorer response to musculoskeletal treatment. Thus it is important to address such symptoms and disturbances in patient with neck pain not only to gain symptomatic relief but also it reverse the impairment to improve physical performance and function. In people with neck pain, coordination of head movements, intersegment coordination of the vertebrae of the cervical spine, and postural balance were show to be impaired. There is an abundance of receptors in the cervical muscles, and there are multiple cervical central and reflex connections to the vestibular, visual, and
postural control systems. In particular, the deep portions of the suboccipital muscles have the highest cervical receptor density and are known to have a specific role in these reflex and central connections.

It is estimated that between 10-40% of persons sustaining neck trauma as a result of a motor vehicle crash will go on to have chronic persistent problems. After pain, dizziness and unsteadiness are the next most frequent complaints in those with persistent problems following a whiplash trauma, with up to 70% reporting this complaints.

Cervicogenic dizziness is often related to upper cervical degeneration or a neck injury, such as whiplash. It is thought to result from a perturbation in sensory information from the upper cervical spine. Neck pain has been shown to be associated with balance disturbances and gait speed are also known to decline with ageing. Neck pain is related to impaired postural balance among patients and is highly prevalent among workers with high postural demands. Dysfunction of the cervical receptors in neck disorders can alter afferent input subsequently changing the integration timing and tuning of sensorimotor control.

Disturbances of balance have been found both in patients with whiplash associated disorders and idiopathic neck pain, neck pain precipitated by trauma resulted in greater or different balance impairments. Impaired cervical joint position sense is commonly argued to rely on abnormal cervical input if true muscle vibration, alternating afferent input, but not in mental interventions should have an effect on head repositioning acuity and neck pain perception. The role of deep cervical flexor muscles in postural support and the knowledge of impaired activation of these muscles in people with neck pain. The deep portions of the sub occipital muscles have the highest cervical receptor density and are known to have a specific role in these reflex and central connections. We found that greater and lesser dysfunction likewise was not related to headache classification or length of headache history. A chance in the nature of headache with age plays an important role in the choice of treatment.

Reduced cervical range of motion is one of the main complaints from patients showing cervical dysfunction and seeking help from therapists. The persistence of nonspecific neck pain may have a significant impact on patients with health status, activity of daily living, and work-related activities resulting in poor quality of life. Cervical afferent information is important to the control of posture, spatial orientation and coordination of the eyes and head.

Sensorimotor training emphasizes postural control and progressive challenges to the sensorimotor system to restore normal motor programmes in patient with neck pain. The balance training can effectively improve cervical sensorimotor function and decrease neck pain intensity.

**Material and Method**

This comparative study was conducted in the physiotherapy department took nearly 3 months to complete the study (January 2019-April 2019). 50 samples were selected from 70 volunteers based on inclusion criteria of age group of 45 to 65, insidious neck pain for at least 3 months and headache associated with neck pain, able to follow the instructions and spondylolisthesis and the excluded those with previous history of neck and head trauma or surgery, known vestibular pathology, vertigo or dizziness from ear to brain disorders, sensory nerve pathways. Inflammatory joint disease, cerebellar dysfunction. Both the group received exercise for 40mins/session for 5 days a week for 12 weeks the pre and post-test measurement will be taken before and after 3 months by using VAS, patient specific functional scale, Ammer dizziness diagnostic scale, Tinetti balance scale. Group A received balance exercises and group B received sensory motor training.

**Data Analysis:** The collected data were tabulated and analyzed using both descriptive and inferential statistics. All the parameters were assessed using statistical package for social science (SPSS) version 20.0. Paired t-test was adopted to find statistical difference within the groups & Independent t-test (Student t-Test) was adopted to find statistical difference between the groups.
Table -1: Comparing The Values Of Vas Between Group-A And Group-B In Pre And Post Test Vluaes Using Independent (Student) t –Test

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
<th>t - Test</th>
<th>Df</th>
<th>95% CI of the difference</th>
<th>SIG (2-tailed)</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>Mean</td>
<td>S.D</td>
<td>Mean</td>
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<td>Lower</td>
<td>Upper</td>
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Table -2: Comparing The Values Of Psfs Between Group-A And Group-B In Pre And Post Test Vluaes Using Independent (Student) t –Test

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<th>t-Test</th>
<th>Df</th>
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<th>SIG (2-tailed)</th>
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Table – 3: Comparing The Values Of Adds Between Group-A And Group-B In Pre And Post Test Vluaes Using Independent (Student) t –Test

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<th>Group B</th>
<th>t - TEST</th>
<th>Df</th>
<th>95% CI of the difference</th>
<th>SIG (2-tailed)</th>
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Table -4: Comparing The Values Of Tbs Between Group-A And Group-B In Pre And Post Test Vluaes Using Independent (Student) t –Test

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<th>Df</th>
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<td>1.15</td>
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</table>

Results

On comparing the mean values of VAS, both the groups have showed improvement in the post test mean values although the group-A post test mean value (5.0) showing lesser mean value is more effective than Group-B post test mean value (5.40).

On comparing the mean of PSFS, both the groups showed increased PSFS in the post test mean values. But the Group A post test mean value (16.08) showing the higher mean value is more effective than Group B post test mean value (15.28). On comparing the mean of ADDS, both the groups showed increased ADDS in the post test mean values. But the Group A post test mean value (31.09) showing the higher mean value is more effective than Group B post test mean value (33.04).

On comparing the mean of TBS, both the groups showed increased TBS in the post test mean values. But the Group A post test mean value (12.6) showing the higher mean value is more effective than Group B post test mean value (12.1).

Discussion

The present study was conducted with the sample size of 50 subjects to find out the efficacy of sensorimotor and balance exercise in subjects with neck pain. The present data indicates that balance exercise were indeed
efficient in reducing the neck pain, dizziness and in improving the functional activities of the subjects.

In a previous study by Revel et al, evaluated slow motion proprioceptive exercise which mainly concerned with eye-neck coordination for 8 weeks resulted in reduction in neck pain significantly when compared to other training group. Furthermore, Gosselin et al, demonstrated that body performance can be deteriorated by fatiguing on vibrating the neck muscles. Moreover, Roijezon, et al reported conversely improved balance performance was reported after neck coordination exercises.

Some evidence suggests that conventional treatment of manual therapy and specific therapeutic exercise directed towards neuromuscular impairments are effective interventions for relieving neck pain and dizziness symptoms and they improve cervical joint mobility and neck muscle performance. However, these interventions are not specifically directed towards impaired cervical proprioception and balance. The effects of exercise and manual therapy on proprioception (joint reposition sense) and balance remain uncertain. However, so far, all previous interventions were specifically targeting the neck muscle and postural control was assessed as the outcome measure. In contrast, additionally in this study, the exercise programs are individualized according to ongoing progress monitoring. It is expected that the findings of this trial will lead to improved clinical practice guidelines for persons with neck pain with impaired joint position sense and balance.

Endurance training has also showed a statistically significant improvement, however lesser the significant than the motor control exercise group. The study concludes that there seems to be evidence that endurance exercise are more beneficial in general exercise program in reducing neck pain and seems to be advantageous. The study concluded that samples in neck stabilization and postural correction showed better significance than stretch and strengthening exercise in reducing pain and disability and improving posture and breathing patterns. This systematic review maximum studies showed that there was some improvement in neck functional abilities and reduction in neck pain in the endurance training group. The study concluded that the postural alignment achieved from schroth method is better than that achieved by yoga.

**Conclusion**

The present study concludes that balance exercise were indeed efficient in reducing the neck pain, dizziness and in improving the functional activities of the subjects. Although, In the post treatment analysis, both the groups showed significant change in the outcome measures of VAS, tinetti balance assessment tool, dizziness scale, and patient specific functional scale, the group A has significant changes than the group B.

**Conflict of Interest:** None

**Source of Funding:** Nil, This is a self-funded study

**Ethical Considerations:** The manuscript is approved by the Institutional Review board of faculty of physiotherapy(IRB REF NO: IV C- 052/PHYSIO/IRB/201-2019).

**Reference**


30. V. Rajalaxmi, Jiby Paul, M. Nithya, S. Chandra Lekha, B. Likitha, Effectiveness of Three Dimensional Approach of Schroth Method and Yoga on Pulmonary Function Test and Posture in Upper Crossed Syndrome With Neck Pain- A double blinded study, Research J. Pharm. and Tech. 11(5): May 2018
Considerations Related to Safe Handling of Dead Bodies of Deceased Persons with COVID-19: Issues and Review of Guidelines

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¹Associate Professor of Anatomy, ²Associate Professor of Biochemistry, ³Professor of Forensic Medicine & Toxicology, Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences (DMIMS)

Abstract

The Novel Corona Virus (COVID-19) earlier known only as the Wuhan virus, expanded its circle and finally spreading its routes to India. The guidelines/considerations published by various government organizations for management of dead bodies in context of COVID-19 were reviewed.

The problem arrived when experts found some loopholes in government guidelines and other social issues were raised in different parts of country regarding the final rituals of deceased died due to suspected or confirmed cases of COVID-19. Some cases were also observed in neighboring countries also.

In this article, light was thrown on utility of body bags for handling dead bodies, environmental cleaning, autopsy & embalming related issues, precautions in case of community deaths etc. We tried to discuss the issues in light of available guidelines by government of India and other international guidelines.

Keywords: COVID-19, cremation, decontamination, funeral, decomposition.

Introduction

Some of the recent viral outbreaks showing the involvement of respiratory system include severe acute respiratory syndrome (SARS)¹ in 2002-03, Middle-East respiratory syndrome (MERS)² in 2012 etc that lead to life threatening illness. In December 2019, the world was introduced to a novel coronavirus severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2; formerly called 2019-nCoV) causing coronavirus disease 2019 (COVID-19)³ after the outbreak of pneumonia in Wuhan, a city in Hubei Province of China⁴. The Novel Corona Virus (COVID-19) earlier known only as the Wuhan virus, expanded its circle and finally spreading its routes to India⁵. The first case of COVID-19 in India was reported on 30 January 2020 originating from China⁵. The World Health Organisation (WHO) declared the COVID-19 outbreak a Global Health Emergency on January 30, 2020³, and pandemic on 11 March 2020³. As per the data provided by Ministry of Health and Family welfare, Govt. of India, till 19 May 2020, in India⁶ total active cases are 77103, cured or discharged patients and death toll reaching to 402.

COVID-19 pandemic have crossed the death records all over the world including European countries whose health system is considered one of the best in the world. Even the superpower America is struggling to curb the death rate. India being densely populated, the risk of spread is more. The guidelines/considerations of various government organizations for management of dead bodies in context of COVID-19 were reviewed. Certain issues published in media regarding dead body management due to COVID-19 are also discussed.

Present available guidelines for safe disposal of dead bodies: Various organizations/government bodies
have put forward their respective guidelines for safe management of a dead body in the context of COVID-19. Some of the major guidelines across the globe available for the same purpose are mentioned below.

- ‘COVID-19: Guidelines on Dead Body Management’- by Director General of Health Services (DGHS), MOH & FW, GoI published on 15.03.2020
- ‘Infection Prevention and Control for the safe management of a dead body in the context of COVID-19’ by World Health Organization (WHO) – Interim guidelines published on 24.03.2020
- ‘Considerations related to the safe handling of bodies of deceased persons with suspected or confirmed COVID-19’ by European Centre for Disease Prevention and Control (ECDC), Stockholm.
- ‘Dead body management in the context of the novel coronavirus (COVID-19)’ by Pan American Health Organization (PAHO) – Interim recommendations published on 18.03.2020
- ‘COVID-19 – Handling of bodies by funeral directors’ by State of New South Wales NSW Ministry of Health, Govt. of Australia released on 02.04.2020

The Concern: In spite of above mentioned available guidelines, some issues were observed.

1. Lacunae in guidelines: Anadolu Agency report mention about experts’ belief that Health Ministry’s guidelines regarding the handling of infected dead bodies have huge gaps. The seven-page guidelines issued by the Health Ministry do not specify the method of cremation or the plastering of graves. No clear guidelines are written in report about the body bags used.

2. Social issues: The controversies were published in certain media reports about cremation of lady in Delhi who died after corona virus infection following co-morbidity. The staff from Delhi’s two crematoriums allegedly denied last rites, fearing the spread of virus. Similar news came from Mumbai where cemetery at Malad denied burial of dead body of corona victim, fearing spread of coronavirus.

3. A heartbreaking tragedy published in The Hindu-Chennai, where an orthopedic surgeon of Nellore died due to COVID-19 after contracting infection from his patients. The local residents, ignoring prohibitory orders, protested the cremation of a doctor with apprehension that the cremation of the body could result in the spread of novel Coronavirus in the area.

Before handling the dead body: The most important task is to impart training of persons involved in handling the dead body. This include:

- infection control procedures
- hand hygiene
- how to put on and remove personal protective equipments (PPE)
- safe handling of sharps
- regular environmental decontamination including all surfaces and equipments with disinfectant
- disinfect the bag housing dead body; instruments and devices used on the patient
- ensure that any body fluids leaking from orifices are contained
- avoid unnecessary manipulation of the body that may expel air from the lungs

Utility of Body bags: WHO guidelines say that body bags are not necessary, although they may be used for other reasons (excessive fluid leakage) and further it is mentioned to wrap the body in cloth. Interim recommendations of PAHO also recommend that body bags are not necessary for packing the body. But factsheet issued by NSW, Australia writes that body should be transported and stored in a two leak proof body bags (double bagged). The outer body bag should be clearly and permanently labeled, such as: “COVID-19 – Handle with care”. Used body bags should be disposed of in clinical waste streams. MOH & FW guidelines mentions about using of leak proof plastic body bag but
thickness is not mentioned. Precautions issued by dept. of health, Govt. of Hong Kong recommend robust and leak-proof transparent plastic bag of not less than 150 μm thick, and should accompany with another layer of a mortuary sheet or opaque bag. It should be zipper closed; Pins are not to be used. Dr. T. Jacob John, a former head of the Virology Centre at ICMR said the plastic bag covering the body should be at least 100 microns thick, so it does not tear off easily.

**Environmental Cleaning:** Environmental Cleaning is the key stone procedure to curtail the spread of infection. It should be part of Standard Precautions, which should be applied to all patients in all healthcare facilities.

MOH & FW guidelines quoted to wipe all surfaces with 1% Sodium Hypochlorite solution with contact time of 30 minutes and then allowed to air dry. Hospital Infection Control Committee of AIIMS, New Delhi advocated the use of freshly prepared 1% Sodium Hypochlorite for a contact time of at least 10 minutes as a disinfectant for cleaning and disinfection. Alcohol (e.g. isopropyl 70% or ethyl alcohol 70%) can be used to wipe down surfaces where the use of bleach is not suitable, e.g. metals. JIPMER recommended use of 0.5% Hypochlorite with contact time of 10 minutes.

WHO- Interim Guidelines recommended disinfectant with a minimum concentration of 0.1% (1000 ppm) sodium hypochlorite (bleach), or 70% ethanol for at least 1 minute. PAHO advised surface disinfection with 0.1% sodium hypochlorite or 62-71% ethanol. ECDC mentioned use of hospital disinfectants active against viruses. Decontamination may be performed with 0.1% sodium hypochlorite.

**Autopsy related guidelines:** MOH & FW guidelines clearly mention to avoid autopsy. If autopsy is to be performed for special reasons, infection prevention and control practices should be adopted. The lungs and other organs may still contain live virus and additional respiratory protection is needed during aerosol generating procedures like use of power saws, washing of intestines etc. Airborne precautions include fluid resistant & long sleeved gown, P2/N95 masks, face shields or safety glasses etc. Number of staffs should be kept to minimum; round ended scissors & appropriate PPE should be used. Only one body cavity should be opened at a time. Negative pressure should be maintained in mortuary. Mortuary should be adequately ventilated.

After autopsy, body must be disinfected with 1% Sodium Hypochlorite and covered by a body bag. The exterior of body should also be decontaminated with 1% Sodium Hypochlorite solution.

DMER, Mumbai issued medical guidelines for death declaration on 09 April 2020 which mentions about no postmortem examination in suspected COVID-19 deaths.

**Embalming:** All major guidelines mentions that embalming should not be performed on dead bodies of COVID-19. This minimizes excessive manipulation of body. If embalming is must, embalmer should be certified and trained in the use of PPE for contact and airborne precautions. This includes P2/N95 respirator which has been fit checked, gown, gloves and eye protection.

**Community Deaths:** The present guidelines of MOH & FW are limited to hospital deaths only. MOH & FW guidelines lack the guidelines for such home deaths. Interim guidelines of WHO mention about these.

- Staff that will manage dead bodies, such as ambulance staff, police and general practitioners, should use PPE compulsorily.
- Person preparing dead body for last rites (e.g. washing, cleaning or dressing body, tidying hair, trimming nails or shaving) should wear gloves, eye and mouth protection (face shield or goggles and medical mask). Clothing worn to prepare the body should be immediately removed and washed after the procedure or an apron or gown should be worn. Washing of hands with soap and water is to be followed.
- Children, elderly people (>60 years old), and anyone with underlying illnesses should not be involved. Number of people involved in preparations should be kept to minimum.
- Nobody should touch/kiss the body and should wash their hands thoroughly with soap and water or alcohol based hand rub to minimize the risk of transmission; physical distancing measures should be strictly applied (at least 1 meter between people). Physical distance should be maintained.
- Those involved with placing the body in the grave, on the funeral pyre, etc. should wear gloves and wash hands with soap and water.
• Funeral should not involve more than five people. Participants should observe social distancing plus respiratory etiquettes and hand hygiene.

• No need to burn or dispose of the belongings (cloths, utensils etc) of the deceased. However, they should be handled with gloves and cleaned with a detergent followed by disinfection with a solution of at least 70% ethanol or 0.1% (1000 ppm) bleach.

**Transportation:** WHO guidelines mention that no special transport equipment or vehicle is required. Standard precautions (surgical mask, gloves, etc) must be followed by the personnel handling the body to minimize exposure to infected bodily fluids, contaminated objects and other contaminated environmental surfaces.

The body, secured in a body bag, exterior of which is decontaminated poses no additional risk to the staff involved in dead body transportation. During transport, direct contact with human remains or bodily fluids should be avoided. The vehicle should be decontaminated with 1% Sodium Hypochlorite after transportation.

**Cremation or Burial:** WHO interim guidelines clearly mention that people who died from COVID-19 can be buried or cremated. MOH & FW guidelines and PAHO recommendations also mention about the both.

In another instance, directions issued by Municipal Commissioner of Municipal Corporation of Greater Mumbai on 30.03.2020 quoted that all dead bodies of COVID-19 should be cremated at the nearest crematorium irrespective of religion. The reason being existing burial grounds are in highly dense locality with high chances of contamination. Further burial should not be allowed as procedure of packing the body in plastic bag and burying same prevent early decomposition and risk continuing the virus for future spread. The same circular was then revised and the BMC has allowed burial within Mumbai provided the burial ground is large enough to ensure there is no threat of transmission to the area’s residents.

Department of Forensic Medicine at the AIIMS, New Delhi has released its specific protocol, mentioning about points missed in the guidelines issued by the Health Ministry. Head of Forensic Medicine dept of AIIMS New Delhi also clarified that cremation of dead body of person died due to corona virus has no side effects by any method using fire or electrical or gas or by burial.

New protocol described that cremation should be preferred for the complete elimination of chances of infection in either electric or gas crematorium in a zipped body bag. If the burial of the body is requested, then it should be assured that the body is buried in a thick, airtight coffin. Dead body needs to be buried at a depth of 4-6 feet and should be cemented immediately as an additional precautionary measure.

Director AIIMS New Delhi, Dr. Guleria clarified that corona virus can not spread through dead bodies. It spread from respiratory secretions. Coughing is necessary for spread of virus. So there is no risk in cremating the infected dead bodies.

**Conclusion**

Considering the huge impact caused by COVID-19 pandemics on Global health care systems, it is important to reduce its transmission and prevent the number of deaths. It can spread through nasopharyngeal secretions but care should also be taken while contacting body fluids of deceased persons of suspected or confirmed case of COVID-19.

Guidelines issued by various government authorities should be meticulously followed and utmost care should be taken while handling the dead body by the concerned.

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Age Estimation by Different Techniques of Dentin Translucency: A Literature Overview

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Abstract

Background: Human Dentition presents as the most durable and resilient part of the skeletal system in the body subjected to wide range of physiological changes with increase in age such as attrition, cemental apposition. Among several functional changes dental root translucency is often considered to be more reliable parameter for estimation.

Methodology: The literature search for articles written in the English language in PubMed, MEDLINE, Embase and Google Scholar database by using MeSH terms “Dentin Translucency”, “Age Estimation”, “Forensic Method” “Dentin in Forensics”, “Digital Method of Age Estimation”, “Dentin Age estimation” was retrieved. The present evaluation is to provide a broad literature review on “Dentin translucency” as a tool in age estimation with emphasis on the most substantial method obtainable for identification.

Observations: It was observed both traditional and digital method are significant and reliable for identification of age by root dentin translucency. The custom built software program is commercially available and extensively used image editing software program. Moreover, digital method is easy to use, precise and less time consuming. Considering these benefits, the present study recommends the use of digital method to assess root dentin translucency for age estimation.

Conclusion: Though conventional sectioning of teeth with observation using caliper or under microscope was gold standard, due to advancement in technology and more precise results digital method could possibly serve as more reliable where estimation of age plays a vital role in identification process in the field of forensics.

Keywords: Dentin Translucency, Forensic science, Image software, precise age, Physiological Method.

Introduction

Age assessment by dental examination is one of the most reliable method of chronological age estimation used for criminal or illegal responsibilities, judicial punishment, medical, employment, execution of minority and anthropological purposes[1,2]. Eruption of teeth, tipping, later or horizontal movement through maxilla or mandible, mechanical or physiological attrition, periodontal disease, secondary dentine or cemental apposition, root resorption, dentin translucency and changes in color are substantial features that increases or changes with age. Physical or morphological, histological, physiological, radiological, chemical method were developed to evaluate dental age[3].

Once dental growth in association with or without skeletal growth is complete, developmental stages could not be used for age estimation instead the indicators such as attrition, loss of periodontal attachment, coronary secondary dentin formation, resorption of
root, transparency of root undergo changes through life are being used[4]. These Morphological or Physical method are based on assessment of ex-vivo teeth for age estimation in younger as well as adult population. The samples of the extracted tooth can be sectioned or unsectioned and observed with the eye or with microscope[5].

Gustafson[6], Solheim[7], Bang and Ramm[8], Lamendin et al[20] supported the assessment of dentin translucency at the tooth root as a reliable morphological parameter for age estimation by using calipers. Tomes, the first investigator described the translucent dentin as the affinity of root dentine to appear transparent in the transmitted light in dense section from the apex upwards as a result of the merging of the dentinal tubules[21, 22]. Conversely, numerous attempts were made to measure translucency using computer-based customized software[14]. The present evaluation is to provide a broad literature review on “Dentin translucency” as a tool in age estimation with emphasis on the most substantial method obtainable for identification.

**Methodology**

The literature search for articles written in the English language in PubMed, MEDLINE, Embase and Google Scholar database by using MeSH terms “Dentin Translucency”, “Age Estimation”, “Forensic Method” “Dentin in Forensics”, “Digital Method of Age Estimation”, “Dentin Age estimation” was retrieved. The present evaluation is to provide a broad literature review on “Dentin translucency” as a tool in age estimation with emphasis on the most substantial method obtainable for identification.

**Review of Literature: Bang and Ramm in 1970** presented a simple and accurate method for age estimation by sectioning of the teeth based on the measurement of the apical translucent zone length using incisors and cuspids. The zone length was measured buccally from the cementoenamel junction to the root apex. It was concluded

\[
\text{Age} = B_0 + (B_1 \times X) + (B_2 \times X^2)
\]

formulae is used for <9mm translucent zone and if translucent zones > 9 mm age is estimated by using \(\text{Age} = B_0 + (B_1 \times X)\)(where X stands for Translucent zones) formulae. The teeth were sectioned. In this study transparent root dentin zone was measured halfway between the pulp chamber and the root margin where the translucency is nearly horizontal[8].

**Nicolas et al in 1993** evaluated the image analysis systems for digital root dentin translucency. The study showed measurements obtained by Computer based translucency in compared to the conventional caliper method prove to be the reliable precise method for age estimation[9].

**Thomas et al in 1994** investigated the apical translucent dentine distribution among 49 vital and 55 non-vital teeth by using sectioned teeth. Freshly extracted teeth were sectioned longitudinally in the buccolingual plane to a thickness of 150um. Sections were photographed in polarized light at a standard magnification. Black-and-white prints of translucent apical dentine under standard magnification obtained were plotted using an Apple II digitizer. Regression analysis performed by using formulae derived as

\[
L\% = \frac{L}{L \times 100}, \quad A\% = \frac{S}{D \times 100}
\]

where \(L\) = length, \(A\) = area, \(S\) = area of translucent dentine and \(D\) = area of root dentine. The study concluded increased in apical translucency present in non-vital teeth when related with vital teeth at any specified age[10].

**Amariti et al in 1999** suggested different techniques for determining the age of a subject by means of the analysis of microscopic and macroscopic structural modifications of the tooth with ageing. Determination of age was performed by using regression formulae of

\[
\text{Age} = \text{RST} \times 5.3 - 2.28 \quad \text{by ratio of dentinal sclerotic (RST) or tubule thickness},
\]

\[
\text{Age} = \text{Secondary dentin} \times 0.20 + 20.35 \quad \text{by deposition of secondary dentine ratio},
\]

\[
\text{Age} = \text{Cemental apposition} \times 9.19 + 6.74 \quad \text{by using cemental apposition ratio.}
\]

The study stressed that dense sclerosis or dentinal tubule thickness provides more precise results for estimation of age than secondary dentine and cementum thickness[11].

**Valenzuela et al in 2002** presents three multiple regression models for age estimation from fresh extracted teeth. Model I for manual morphologic analysis using dentin color, attrition and cementum apposition, Model II for computer morphologic analysis using pulp and translucency width and area, Model III including both manual and computer morphologic analyses by attrition, color and translucency width. The study recommended image analysis of root dentin translucency width on freshly extracted teeth as a significant method for estimation of age[12].

**Singh et al in 2013** used a simple digital method
on 50 extracted permanent teeth sectioned to 250 μm to measure root dentin translucency and compared digital measurements to conventionally obtained dentinal translucency measurements. Assessment was made by using the formulas as

\[ \text{Age} = 32.3103 + (2.9452 \times \text{translucency length}) \]

by conventional method and

\[ \text{Age} = 32.0417 + (2.8151 \times \text{translucency length}) \]

by digital method. Application of these methods revealed a similar reliability of both the methods to assess age to within ±5 years of the actual determined age\[13\].

Acharya in 2014 proposed a new digital method with the help of commercially accessible computer hardware and software. Root dentin translucency area and length were measured on 100 sections of 250 μm thickness. Regression formulae derived using translucency length and area measurements showed

\[ \text{Age} = 29.91 + (7.45 \times \text{ATL}) + (-0.44 \times (\text{ATL} \times \text{ATL})) \]

by average translucency length, \n
\[ \text{Age} = 28.61 + (5.50 \times \text{MTL}) + (-0.24 \times (\text{MTL} \times \text{MTL})) \]

by maximum translucency length and

\[ \text{Age} = 31.75 + (2.97 \times \text{TA}) + (-0.07 \times (\text{TA} \times \text{TA})) \]

by translucency area. The study revealed smaller mean difference and larger frequency of errors for area in compared to length by digital method\[14\].

Chopra et al in 2015 use a digital method to estimate dentinal translucency on sectioned teeth and compared digital measurements by using computer based hardware and image analysis with a scanner followed by analyzing using American Board of Forensic Odontology (ABFO) no. 2 scale on the scanner platen by plotting axis method to conventionally root dentin translucency measurement method. Age estimation was performed by conventional method using

\[ \text{Age} = 29.720 + (4.102 \times \text{translucency length}) \]

and by digital method using \n
\[ \text{Age} = 29.823 + (3.930 \times \text{translucency length}) \]

The study concluded that the results obtained by both the methods are similar and constant with findings of various previous similar studies\[15\].

Bommannavar and kulkarni in 2015 measured root dentin translucency on 50 single rooted teeth sectioned longitudinally to obtain 0.25 mm uniform thickness manually and using a custom built software program Adobe Photoshop 7.0 version. The study illustrated age estimation using linear regression equations showed better efficiency of the digital method using regression formulae of

\[ \text{Age} = 22.809 + (5.364 \times \text{translucency length}) \]

when compared with the caliper method using regression formulae of \n
\[ \text{Age} = 25.874 + (5.597 \times \text{translucency length}) \]

for assessment\[16\].

Narayan VK et al in 2017 assessed whether physiological changes of the teeth allow probable correlation for age estimation using conventional caliper method. Root dentin translucency of unsectioned tooth was observed under stereomicroscope by modifying Johansson and Lamendin method. Age was derived by using

\[ \text{Age} = 0.2 \times X1 + 1.1 \times X2 + 0.3 \times X3 + 0.7 \times X4 + 17.9 \]

where \n
\[ X1 – \text{Root dentin translucency; } X2 – \text{Root dentin color; } X3 – \text{PDL attachment; } X4 - \text{Attrition}. \]

The study showed root dentin translucency evaluated by using stereomicroscope and Vernier caliper produced the strongest correlation to actual age when compared to other morphological features\[17\].

Gupta et al in 2017 conducted a study to measure translucency on sectioned teeth using digital hardware or software and to correlate degrees of root dentin translucency length with age by using

\[ \text{Predicted Age} = 25.28 + 1.81 \times \text{TD} \]

(Translucent Dentin length). 62 freshly extracted single-rooted permanent teeth were sectioned to 250μm thickness and scanned by flatbed scanner using digital software. Each tooth section was positioned next to an ABFO No. 2 scale on the platform and scanned at a resolution of 600 dpi. The images were obtained in Adobe Photoshop 7.0.1 image software followed by measurement of translucency length of the scanned images by using guides\[18\].

Bhardwaj et al in 2019 performed an investigatory study to compare the effectiveness of conventional, stereomicroscopic and digital method for age estimation by measuring root dentin translucency. Buccolingual sections of 30 freshly extracted permanent teeth were made of thickness 250μm by using micro motor and Arganksa stone. Analysis was performed by obtaining linear regression formula of

\[ \text{Age: } -9.947 + (8.610 \times \text{translucency length}) \]

by conventional method, \n
\[ \text{Age: } -7.797 + (8.742 \times \text{translucency length}) \]

by stereomicroscopic method and
Age: -8.9+ (8.430 x translucency length) by digital method derived. The author observed Digital method using image analysis software is statistically significant method followed by Conventional with the least being the Stereomicroscopic method[19].

Discussion

Physical or somatic changes, secondary sexual features, radiological examination of primary or permanent teeth eruption sequence, ossification centers are various significant approaches of age estimation. There is progressively strong evidence that dentine transparency is directly proportional to the increase in age and hence serves as a consistent tool to aid the determination of age estimation in both living and the deceased[23]. Many studies have used custom-made software American Board of Forensic Odontology No. 2 scale on the scanner platen, stereomicroscopy and digital Vernier caliper measurements to measure the root dentine transparency level. Conventionally, root dentin translucency was measured microscopically using calipers on sectioned teeth. The Translucency also can be assessed macroscopically on intact unsectioned teeth by using digital calipers but tooth sections offer improved results. In recent times, the use of custom fabricated software programs have been recommended owing to its accuracy and reliability[24].

Over the years root dentin translucency was measured using a digital caliper on the teeth sectioned using a hard tissue microtome. The major shortcoming using this method was that the sectioned teeth could not be properly stabilized and thus increasing the risk of damage or fracture by the pointed beaks of the caliper scale. Also, the magnifying glass could not enhance the exact clarity between the translucent and the opaque zone[10].

The improvement of the digital method is that the translucency measurements obtained were magnified at ×3 magnifications using the Zoom Tool, which permitted better visualization of the junction between the opaque and transparent zone. This could not be accomplished by the caliper method; hence that amount of magnification necessary for accurate age estimation can be determined[9,19]. However, the values of the root dentin translucency obtained by conventional and digital were very analogous, with no clear superiority of one method over the other by various studies. Furthermore, translucency can be measured by tooth sections provide better detail irrespective of the section thickness. Combination of sectioning of teeth followed by digital image analysis is often recommended.

Conclusion

Though conventional sectioning of teeth with observation using caliper or under microscope was gold standard and accurate, it is a more time-consuming destructive approach and is significant often for postmortem cases where utilization of numerous tooth is possible but less practical for living individual where tooth has to be extracted for such identification method in case of medico legal conflicts. Due to advancement in technology and more precise results digital method could possibly serve as more reliable where estimation of age plays a vital role in identification process in the field of forensics. Hence, further studies on a large scale are necessary to determine reliability of digital approach method without sectioning or compromising the tooth to estimate the age without damaging the integrity of tooth.

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Study of Fingerprint Pattern: A Cross Sectional Study

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Abstract

A fingerprint is an impression left by the friction ridges of a human finger. The recovery of partial fingerprints from a crime scene is an important method of forensic science. Moisture and grease on a finger result in fingerprints on surfaces such as glass or metal. Objective: To determine the predominant fingerprint pattern in and around Mandya district. The present study was conducted at department of Forensic Medicine Adichunchanagiri Institute of Medical Sciences, Mandya from 1st January to 31st January 2019. Total subjects included were 50 Male and 50 Female students. Subjects who were healthy and having normal hands were included in the study. In present study the Ulnar loop was the most frequently observed pattern followed by Plain whorl, in the total subject population in all ten digits. The least frequently observed pattern in the total population were Simple arches, twinned loops, tented arches, radial loops, accidental types and Exceptional arches both in Male and Female. Fingerprints can be captured as graphical ridge and valley patterns. Because of their uniqueness and permanence, fingerprints emerged as the most widely used biometric identifier in the 2000s.

Keywords: Finger Prints, Loop, Whorls, Arches, Composite, Biometry.

Introduction

A fingerprint is an impression left by the friction ridges of a human finger. The recovery of partial fingerprints from a crime scene is an important method of forensic science. Moisture and grease on a finger result in fingerprints on surfaces such as glass or metal. Deliberate impressions of entire fingerprints can be obtained by ink or other substances transferred from the peaks of friction ridges on the skin to a smooth surface such as paper. Fingerprint records normally contain impressions from the pad on the last joint of fingers and thumbs, though fingerprint cards also typically record portions of lower joint areas of the fingers.

Human fingerprints are detailed, nearly unique, difficult to alter, and durable over the life of an individual, making them suitable as long-term markers of human identity. They may be employed by police or other authorities to identify individuals who wish to conceal their identity, or to identify people who are incapacitated or deceased and thus unable to identify themselves, as in the aftermath of a natural disaster.

In the Henry Classification System there are three basic fingerprint patterns: loop, whorl, and arch, which constitute 60–65 percent, 30–35 percent, and 5 percent of all fingerprints respectively. There are also more complex classification systems that break down patterns even further, into plain arches or tented arches,[5] and into loops that may be radial or ulnar, depending on the side of the hand toward which the tail points. Ulnar loops start on the pinky-side of the finger, the side closer to the ulna, the lower arm bone. Radial loops start on the thumb-side of the finger, the side closer to the radius. Whorls may also have sub-group classifications including plain whorls, accidental whorls, double loop whorls, peacock’s eye, composite, and central pocket loop whorls.1,2

Fingerprint identification, known as dactyloscopy,3

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or hand print identification, is the process of comparing two instances of friction ridge skin impressions (see Minutiae), from human fingers or toes, or even the palm of the hand or sole of the foot, to determine whether these impressions could have come from the same individual. The flexibility of friction ridge skin means that no two finger or palm prints are ever exactly alike in every detail; even two impressions recorded immediately after each other from the same hand may be slightly different. Fingerprint identification, also referred to as individualization, involves an expert, or an expert computer system operating under threshold scoring rules, determining whether two friction ridge impressions are likely to have originated from the same finger or palm (or toe or sole).

**Objective:** To determine the predominant fingerprint pattern in and around Mandya district.

**Methodology**

The present study was conducted at department of Forensic Medicine Adichunchanagiri Institute of Medical Sciences, Mandya from 1st January to 31st January 2019. Total subjects included were 50 Male and 50 Female students. Subjects who were healthy and having normal hands were included in the study.

**Results**

In present study the Ulnar loop was the most frequently observed pattern followed by Plain whorl, in the total subject population in all ten digits. The least frequently observed pattern in the total population were Simple arches, twinned loops, tented arches, radial loops, accidental types and Exceptional arches both in Male and Female.

**Discussion**

In present study the Ulnar loop was the most frequently observed pattern followed by Plain whorl, in the total subject population in all ten digits. The least frequently observed pattern in the total population were Simple arches, twinned loops, tented arches, radial loops, accidental types and Exceptional arches both in Male and Female.

In 1823 Jan Evangelista Purkyně identified nine fingerprint patterns. The nine patterns include the tented arch, the loop, and the whorl, which in modern day forensics are considered ridge details. In 1880 Henry Faulds, a Scottish surgeon in a Tokyo hospital, published his first paper on the usefulness of fingerprints for identification and proposed a method to record them with printing ink. Returning to Great Britain in 1886, he offered the concept to the Metropolitan Police in London but it was dismissed at that time. Up until the early 1890s police forces in the United States and on the European continent could not reliably identify criminals to track their criminal record. Francis Galton published a detailed statistical model of fingerprint analysis and identification in his 1892 book *Finger Prints*. He had calculated that the chance of a “false positive” (two different individuals having the same fingerprints) was about 1 in 64 billion.

Gangadhar. M.R, Rajashekara Reddy. K (1983) reported in a study that the basic finger pattern type loops (57.11%) were common followed by whorls (27.89%) and arches (15.00%) in the general population with significant sex difference and insignificant bilateral difference.

Purkait R, (2003) observed in his comparative study on frequency of fingerprint patterns and variation in the ten digit classification on males (454 samples- 227 from each tribe) of Mundas and Lodhas, a tribal group of Midnapur district in West Bengal where Mundas exhibit higher frequency of whorl and loop patterns while loops are more frequent among Lodhas.

Nithin V (2009) reported in his study on 250 males and 250 females of south Indian population most frequent fingerprint pattern as ulnar loop in the total population as well as in the sex wise distribution.

Arabindbasu (1976) reported distributional trend oft he three principal pattern types having high frequency of loops, moderate whorls and low arches.

**Conclusion**

Fingerprints can be captured as graphical ridge and valley patterns. Because of their uniqueness and permanence, fingerprints emerged as the most widely used biometric identifier in the 2000s. Automated fingerprint verification systems were developed to meet the needs of law enforcement and their use became more widespread in civilian applications. Despite being deployed more widely, reliable automated fingerprint verification remained a challenge and was extensively researched in the context of pattern recognition and image processing. The uniqueness of a fingerprint can be established by the overall pattern of ridges and valleys,
or the logical ridge discontinuities known as minutiae. In the 2000s minutiae features were considered the most discriminating and reliable feature of a fingerprint. Therefore the recognition of minutiae features became the most common basis for automated fingerprint verification. The most widely used minutiae features used for automated fingerprint verification were the ridge ending and the ridge bifurcation.

**Ethical Clearance:** Obtained from Institutional Ethical Committee.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**

A Study to Re-Design the Lay Out for Tertiary Level Health Care Mortuary

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Abstract

Autopsy, post-mortem examination or necropsy is the synonyms used for the examination of the dead body after death to collect all the necessary medicolegal evidences. The post-mortem examination is usually conducted in place which is called mortuary. The mortuary conditions in India are very bad in terms of infrastructure and facilities so they are not suitable to carry out scientific examination which results into post-mortem artefacts. Lack of instruments, facilities like electricity, water and antiseptic agents poses health hazards to mortuary attendant and doctors’ working in mortuary. This paper is aimed at describing the required facilities in a scientifically designed mortuary along with modification in building designs of a district hospital mortuary which is going to become a mortuary of new medical college to serve the purpose of post-mortem examination along with teaching of doctors and nurses.

Keywords: Autopsy complex, mortuary lay out, requirements in mortuary, teaching mortuary.

Introduction

With this modernization era and increased craving of society to deliver speedy and prompt services, much neglected part in healthcare system brings attention of mankind to modernise the infrastructure and staffing of mortuary to give a human touch on handling and disposal of dead bodies for their legal proceedings. The proper and decent modern facilities in mortuary complex will dispel the atmosphere of dislike, fear and hatred associated with mortuary complex in general individual of this country and this will allow the reluctant visitor to visit the mortuary.

In India most of places including secondary and tertiary(medical college) care level mortuaries have primitive facilities for body preservation as well as for autopsy examination, Even some of them deprived of basic necessity like electricity and water supply, Which needs urgent attention and redressal. The concept of a modern mortuary in a hospital, regards the mortuary as a culturally sensitive area in terms of public relation of the hospital¹.

When a patient dies during the course of treatment or receives as brought dead to institution the post-mortem care starts in form of various procedures like washing of body, plugging of body orifices with cotton plug and covering in white cloth which imparts a Respect to Dead body as well as retards the decay of body. When body is required to be preserved for some time and then is dissected to find out the cause of death. This is called an autopsy or post-mortem examination in laymen’s language. Post mortem examination is conducted to find out the cause of death may be for legal or scientific requirement depending on the circumstances leading to the death. The area where such procedure is carried out is called a Mortuary (Or Post-Mortem/Autopsy Room). On certain occasions, the body is also required to be preserved, till disposal arrangement is made either by the relative of the patients or the hospital authority.
Role of an ideal mortuary complex:
The various services provide includes:\(^2\):
- Documentation of incoming and outgoing bodies from Hospital to mortuary complex and their disposal and for identification of the body.
- Postmortem examination of the dead body to find out cause of death by forensic autopsies and pathological autopsies as well.
- The demonstration of Post Mortem findings for teaching purposes to undergraduates as well as post-graduates.
- To provide space for forensic evidence collection and storage until they are suitable for transport to FSL or Pathological Laboratories.
- To provide space for Family/police viewing and facilities for other specialised procedures like mobile Radiography, Photography and video recording etc.

General guidelines for mortuary designs

Every mortuary should have following minimum facilities:\(^3\):
- Suitable arrangements for receiving the dead bodies from the hospital or outside, with separate arrangements for keeping decomposed and infectious bodies (known HIV/hepatitis death cases)\(^4\) etc.
- Requisite space for post-mortem examination as well as to accommodate learning student, nurses or investigation officer.
- Other basic essential amenities like office, reception, toilets, Cold room, changing room, waiting room etc
- There should be fresh air and natural light to be available in each room of the mortuary with cleanliness & hygiene.
- The mortuary complex must be located at a short distance from the hospital preferably away from the general traffic routes used by the public. It must have a separate entrance for visitors and dead bodies.
- There should be a direct link between the hospital and the mortuary to Facilitate easy delivery of the dead bodies for autopsy from the wards. It should have adequate parking space.

MCI guideline of Mortuary complex for 100 MBBS students intake per year: Autopsy Block—there shall be an Autopsy room (approx. 400 sq. mt. area) with facilities for cold storage, for cadavers, ante-rooms, washing facilities, with an accommodation capacity of 20-25 students, waiting hall, office etc. The location of mortuary/autopsy block should be either in the hospital or adjacent to the hospital in a separate structure and may be shared with the department of Pathology\(^5\).

Staffing: The requirement of staff in the mortuary differs from place to place and depends on the type and quantum of work undertaken, the type of institute whether teaching or a Non-teaching hospital. The Sub-Committee Report (Bureau of Police Research and Development of 1975) laid down the staffing pattern and this has been accepted in principle by the government.

I. For initial 100 autopsies per year: (i) Specialists- Two (ii) Post mortem technician-One. (iii) Post mortem Assistant- One. (iv) Clerk/Steno-One. (v) Chowkidar- One. (vi) Peon- One (vii) Sweeper/Morgue attendants-4 (Three sweepers for shift duty round the clock and one as a reliever)\(^6\).

II. For every additional 100 autopsies per year, following additional staff is required: (i) Specialist- One. (ii) Post mortem assistant - One. (iii) Technician- One (for teaching institutions). (iv) Assistant - (300-500 autopsies/yr)-One,(>500 autopsies/yr) Two.

In addition these staff mortuary should require (I) Photographer - One. (II) Dark room attendant- One (on big centres, personnel for photographic work)

Equipments: The equipments required in mortuary vary widely. Only those equipments that are of certain significance related to the mortuary complex are listed as under: (as per the recommendation of Survey Committee Report on Medico-legal Practices in India, 1964)

(i) Basin E. I 12”-2

(ii) Weighing machines 3 No. For weighing bodies, organs and foetus with top loading tray up to 500 gram and up to 5kg.
   a. Platform scale for weighing the whole body - 1
   b. Balance to weight 100gms to 10 kg - 1
   c. Balance to weigh 0.2 gms to 10gms - 1

(iii) Cutting instruments-stainless steel:
   a. Skull cutter (electrical) - 1
b. Organ knife 10” blade, solid forged - 1

c. Organ knife 6” blade, solid forged - 1

d. Caltin solid forged -

e. Cartilage knife 5-1/2” blade solid forged - 2

f. Rib cutter

g. Cartilage knife 4” blade/solid forged - 2

h. Brain knife 10” blade, solid forged - 1

i. Resection knife 3” blade, solid forged - 2

j. Scalpels, BP Handle with blades - 1 Set

k. Bistoury, probe pointed solid forged - 1

(iv) Scissors (stainless steel)

a. Scissors; blunt sharp 8” - 1

b. Scissors; blunt/sharp 6” - 1

c. Scissors; dissecting 5” with one probe point for coronary artery - 1

d. Scissors; bowel, Bernard 11” -

(v) Forceps (stainless steel)

a. Bone cutting forceps 10” straight - 1

b. Bone cutting forceps 10” angled - 1

c. Rib-shears 9-1/2” - 1

d. Dissecting forceps 6” - 1

e. Dissecting forceps 8” - 1

f. Dissecting forceps 10” - 1

g. Toothed and un-toothed forceps - 6 each

(vi) Post-mortem Scissors:

a. Saw, Bernard 11” stainless steel Blade - 1

b. Saw, Bernard 9” stainless steel Blade - 1

(vii) Straight and curved Enterotome, viscrotome - 1 each

(viii) Miscellaneous:

a. Coronet stainless steel - 1

b. Needles, post-mortem half curved & double curved - 1 dozen

c. Probes silver with eye 10” - 1

(d. Chisel, straight 3/4 “ blade - 2

e. Chisel, spine with locating point (stainless steel) - 1

f. Gouge, 3/4” blade, stainless steel - 1

g. Hammer with wrench stainless steel - 1

h. Measures 12” stainless steel - 1

i. Mallet, boxwood with metal bands - 1

j. Small table 20” × 24” × 12” for dissection of organs - 1

k. Measuring jug (one litre) - 1

l. Metal/steel scale - 2

m. Magnifying glass - 3

n. Instrument trolley - 3

o. Cabinet - 1

p. Wooden boards - 3

q. Rubber gloves - Adequate quantity

r. Aprons - Adequate quantity

This list covers almost the entire range of equipments for post-mortem examination. However the following additions are also recommended by some of the authorities:

(viii) Suction Pump & Aspirators - 1 each

(ix) Body Scale - 1

(x) Repairing materials like: Thread white, cotton wool (absorbent), wool waste, a variety of discarded clothes, malleable wire, Polythene bags, Gloves, Masks, and Aprons etc.

(xi) Plastic Bins: For fixing large specimens.

Chemical and Reagents: There should be provisions for following chemical articles.

(i) Bleaching powder for cleaning mortuary table floors, etc.

(ii) 2% Glutaraldehyde for cleaning instruments.

(iii) Formative for sending specimens needing his to pathology.

(iv) Rectified and Methylated spirit as preservative

(v) Thymol crystals
(vi) Common salt
(vii) Sodium fluoride
(viii) Potassium oxalate
(ix) EDTA vials and tubes
(x) Sterilized glass tubes (plain).
(xi) Sterilized glass tubes with swabs
(xii) Liquid paraffin
(xiii) Sealing wax etc.
(xiv) Big size envelope, plain papers etc.

Universal Precaution: Eye protection (Goggles and face shields), Plastic Gowns, Personal protective equipment (PPE) & Puncture resistant hand protection (plastic or steel gloves)-prevent blood borne transmission.

Material and Method

A yearlong data from April 2017 to March 2018 collected from morgue register of District hospital, Barmer which showed total 268 dead bodies arrived at morgue among which 7 bodies are highly infectious (hepatitis -2, HIV-Aids-1, MDR-TB-1 and decomposed bodies 3). There is tendency of faster disposal of dead bodies to relatives on receiving the requisition of non-postmortem from I.O. The usual average stay of dead body in mortuary remains around 6 hours particularly due to frequent power cuts and interrupted power supply. There were nine unidentified dead bodies disposed from mortuary fairly within 48-72 hrs. There was maximum intake of four dead bodies at a time reported with maximum two dead bodies retained overnight in the mortuary. The space around the fixed cemented mortuary table found inadequate to accommodate 20-25 persons.

Situation of Mortuary Complex:

<table>
<thead>
<tr>
<th>Mortuary Complex</th>
<th>M A I N R O A D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visitors</td>
<td>Hospital Building</td>
</tr>
</tbody>
</table>

Proposed Extension of Mortuary Complex:

<table>
<thead>
<tr>
<th>Open space Y</th>
<th>Doctor room</th>
<th>Toilets</th>
<th>Verandah Entrance</th>
<th>T</th>
<th>Open Space x</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

X: Proposed post mortem viewing gallery, Y: Proposed sample handling room etc.

Conclusion

As usual in the secondary care level hospital the condition of mortuary is worse since basic facilities like regular electric supply and water for cleaning dead bodies is not available. Due to lack of facilities there are chances of producing post mortem artefacts and missing out valuable findings. Provisions of mortuary facilities and services in a tertiary care hospital have an important bearing in terms of public relation of the hospital. To convert this mortuary into a teaching mortuary a post-mortem viewing gallery should be incorporated to accommodate the 20-25 students and a specimen handling room required as extension.

Ethical Clearance: Taken from institutional Ethics committee of new teaching (District) hospital, Barmer

Source of Funding: Self

Conflict of Interest: Nil

References
available from http://www.partnershipsbc.ca/pdf/

procurement


Determinant Analysis of Factors Influencing Tuak Consumption Culture on Guardian Earth Through the Leininger Model Sunrise Approach Theory

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Abstract

People who consume alcoholic drinks in various regions in Indonesia, if viewed through the Sunrise Model approach, is influenced by several things, including technological factors, religious and philosophy of life factors, social and family relationships factors, cultural and styles life factors, policy and regulatory factors, economic factors and educational factors. The purpose of this research is to know the determinants of factors that influence the Culture of Tuak Consumption on Bumi Wali Tuban through the Leininger Model Theory Approach. The research design used in this study was analytic with a cross sectional approach. The population in this study are all residents in the area of Tuban Regency with a total of 1,291,665 people with a sample size of 400 taken using cluster sampling. Data was collected by using a questionnaire. The collected data was tabulated, analyzed using frequency distribution and percentage and presented in the distribution table. Analysis of bivariate and mutivariate data used logistic regression to find factor determinants. The results show that cultural values and lifestyle are the factors that most influence the culture of tuak consumption with p value 0.000 (p <0.05) and OR 23.11. This means that cultural and lifestyle factor have a chance of 23,11 times for someone to drink tuak. Tuak consumption in Tuban Regency is a culture that has declined and become a characteristic. This drink is “obligatory” and serves as a banquet for traditional events or traditional rituals in Tuban.

Keywords: Consumption of tuak, Leininger’s Sunrise Model Theory.

Introduction

As one of the drinks that contain alcohol, palm wine is also a favorite drink in various regions in Indonesia, especially in areas where Lontar trees grow, sap trees which are usually called sap can be processed into drinks which became known as “Tuak”. Apart from Tuban, other areas that also have an old habit of consuming Batak, specifically the North Tapanuli region, Bali, South Sulawesi Toraja Tribe and Madura.

The results of the Demographic and Population Survey of Indonesia (IDHS) in 2012 also provided information that the percentage of alcohol drinkers in men aged 15-19 years was 30.2% and those aged 20-24 years was 52.9%, while the percentage of women aged 15-19 years by 3.5% and aged 20-24 years by 7.1%(1). Data on the number of consumers of Tuak and other types of alcoholic drinks in Tuban according to the District Health Office of Tuban is not clear. But in general, if we look at the daily life of the Tuban community, tuak has become a chatting partner for them. Every afternoon and evening the Tuban community has a habit of gathering, talking in groups, accompanied by a drink of wine. And it has become a hereditary culture in the city of Tuban since long ago.

The number of people who consume alcoholic beverages/palm wine in various regions in Indonesia when viewed through the Sunrise Model theory approach, namely the Transcultural approach, is influenced by several factors, including technological factors, religious...
factors and philosophy of life, social factors and family relationships, cultural factors and lifestyle, policy and regulatory factors that apply, economic factors and educational factors. From a health point of view the consumption of alcoholic drinks can also cause various diseases, and one of the diseases that often arise due to consuming alcoholic drinks/Tuak is Hypertension. Sesso also mentioned that there is a positive relationship between alcohol consumption and hypertension in both men and women(2).

According to the Regional Regulations of Tuban No. 9 2016, alcoholic drinks are classified into three groups, namely: Group A is a drink with an ethyl alcoholic or ethanol content of up to 5%, Group B is a beverage with an ethyl alcohol or ethanol content of 5% to 20%, Group C is drinks with 20% to 55% ethyl alcohol or ethanol content. Tuak is an alcoholic beverage with 4% content. Based on the decisions and regulations that have been set, then tuak can be classified as one type of liquor class A.

In Tuban Tuak comes from sap of sap which is tapped from a siwalan tree or palm tree, which is accommodated in a bamboo “Bumbung” 40-50 cm long, and is stored for several days. The longer the storage, the higher the alcohol content it contains(3). Diseases that can be caused by excessive alcohol consumption include: 1) Heart and blood vessel disease(4), 2) diabetes mellitus, 3) kidney disease(5),(6); 4) liver disease; 5) psychological disorders(7).

The tradition of drinking palm wine has become a tradition of hereditary in Tuban. This drink is “mandatory” to exist and is a banquet at traditional events or traditional rituals in Tuban. It is not uncommon for Tuak to be a feast for young people when guests arrive from areas outside of Tuban. At the gathering we often encounter wine drinks in it, and also in Tuban there are not a few shops that sell this drink.

Material and Method

The research design used in this study was analytic with cross sectional approach. The population in this study were all residents in the Tuban Regency area with a total of 1,291,665 people. The sample in this study was a portion of the population in the Tuban Regency area. The inclusion criteria in this study were: population recorded in population data, male sex and adult age. The sample size in this study was 400 respondents. The sampling technique in this study was carried out by cluster sampling.

The dependent variable in this study is the culture of drinking wine. The independent variable in this study was taken from Leininger’s Sunrise Model Theory, namely technological factors, religious and philosophical factors, social factors and family attachment, cultural and lifestyle factors, policy and regulatory factors, economic factors, Education factors. The instrument used in data collection was a questionnaire created by the researcher by developing the Sunrise Model theory. Statistical test uses logistic regression to analyze dominant factors.

Result

Respondent characteristics showed that all respondents were male, in the age range of 40 - 59 years (66.50%), and most worked in the private sector (41%) (table 1).

Table 1: Distribution of Respondent Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>400</td>
<td>100</td>
</tr>
<tr>
<td>Female</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20–39 years</td>
<td>71</td>
<td>17,75</td>
</tr>
<tr>
<td>40–59 years</td>
<td>266</td>
<td>66,50</td>
</tr>
<tr>
<td>60–79 years</td>
<td>60</td>
<td>15</td>
</tr>
<tr>
<td>80–100 years</td>
<td>3</td>
<td>0,75</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does not work</td>
<td>21</td>
<td>5,25</td>
</tr>
<tr>
<td>Farmer</td>
<td>139</td>
<td>34,75</td>
</tr>
<tr>
<td>Fisherman</td>
<td>5</td>
<td>1,25</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>58</td>
<td>14,5</td>
</tr>
<tr>
<td>Private employees</td>
<td>164</td>
<td>41</td>
</tr>
<tr>
<td>Government employees</td>
<td>13</td>
<td>3,25</td>
</tr>
</tbody>
</table>

The results of the analysis using the logistic regression test showed that the technology variable obtained a regression coefficient of -0.038 with a significance level (r-value) of 0.998> 0.005. Technological factors do not significantly influence the culture of palm wine consumption in Bumi Wali Tuban. Religious variables obtained a regression coefficient of 1.069 with a significance level (r-value) of 0.344> 0.005. Religious factors do not significantly influence the culture of palm wine consumption in Bumi Wali Tuban. Family variables obtained a regression coefficient of 19.030 with a level of significance (r-value) of 0.996> 0.005. Family factors do not significantly influence the culture of palm wine.
consumption in Bumi Wali Tuban. Variable values of culture and lifestyle obtained a regression coefficient of 3.150 with a significance level (value-value) of 0.000 <0.005. Lifestyle factors significantly influence the culture of palm wine consumption in Bumi Wali Tuban. The policy variable obtained a regression coefficient of 20.662 with a significance level (r-value) of 0.993 >0.005. Policy factor does not significantly influence the culture of palm wine consumption in Bumi Wali Tuban. Economic variables obtained a regression coefficient of 0.227 with a level of significance (r-value) of 0.620 >0.005. Economic factors do not significantly influence the culture of palm wine consumption in Bumi Wali Tuban. The education variable obtained a regression coefficient of -1.641 with a significance level (r-value) of 0.000 <0.005. Educational factor significantly influences the culture of palm wine consumption in Bumi Wali Tuban. The factor of culture and lifestyle values is the most influential factor in the culture of drinking palm wine consumption with p value 0.000 (p value<0.05) and OR 23,111. This means that lifestyle has a 23,111 chance for someone to drink wine. (table 2)

**Table 2: Analysis of Factors influencing the culture of palm wine consumption in Bumi Wali Tuban June 2018**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sig.</th>
<th>Exp (B)</th>
<th>95.0% C.I. for EXP (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>Technology</td>
<td>.998</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Religion</td>
<td>.344</td>
<td>2.914</td>
<td>.317</td>
</tr>
<tr>
<td>Family</td>
<td>.996</td>
<td>1.839E8</td>
<td>.000</td>
</tr>
<tr>
<td>Cultural Value of Lifestyle</td>
<td>.000</td>
<td>23.343</td>
<td>5.144</td>
</tr>
<tr>
<td>Policy</td>
<td>.993</td>
<td>9.402E8</td>
<td>.000</td>
</tr>
<tr>
<td>Economy</td>
<td>.620</td>
<td>1.255</td>
<td>.511</td>
</tr>
<tr>
<td>Education</td>
<td>.000</td>
<td>.232</td>
<td>.107</td>
</tr>
<tr>
<td>Constant</td>
<td>.996</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

**Discussion**

Research shows that almost all Tuban people are Muslim and religious factors do not significantly influence the culture of palm wine consumption in Bumi Wali Tuban. Adrianna Murphy in the article stated that Muslim women were less likely to drink alcohol than non-Muslims(8). Research conducted by Khusnaini, states that there are differences of opinion between community leaders and religious leaders in addressing the circulation of tuak in Kaba Tuban Regency. Community leaders argue that tuak is not intoxicating, contains many benefits and by selling tuak can increase income. While religious leaders forbid tuak to be traded because it is included in intoxicating drinks (khamr)(9).

The data states that the majority of Tuban residents are Muslim but the majority of them are palm wine consumers. They consume tuak for various reasons, among others, just because they want to drink, relieve stress, and to socialize when there are residents’ activities. The results of the study stated that family factors did not affect the culture of palm wine consumption in Bumi Wali Tuban. Sobhee, S et al., In their study stated that, people who live in one house do not influence individuals to buy alcoholic drinks and the greater the number of family members the smaller expenditure on alcohol(10). Research by Constantinescu, Maria, and Cornel Constantinescu, states that drinking alcohol behavior in addition to being influenced by personal choices is also influenced by the environment, for example legislation and friends(11).

According to this research, according to the results of the study by Sobhee, S et al., They are not influenced by the family in consuming tuak. They live in an environment where most of the people are consumers of palm wine, so they are influenced to consume it. Consuming palm wine is common and easy to find in
various places in Tuban. The factor of cultural value and lifestyle is the most influential factor on the consumption of palm wine in Bumi Wali Tuban. The study of Jennifer Ahern et al. States that environmental culture which is permissive to alcohol consumption influences individual alcohol consumption\(^{(12)}\). Research by Riskiyani et al. Shows that individuals understand tuak as a traditional alcoholic drink that has positive and negative effects on its consumption. Tuak is a beverage that can strengthen the brotherhood and is always served in celebration of traditional parties and daily activities, so that it has become a tradition in society. Residents present tuak as a typical drink to entertain visitors or guests, so that visitors or guests become accustomed to wine drinks\(^{(13)}\).

The tuak consumption culture is a culture that has gone downhill in the Tuban region. This drink is “mandatory” to exist and is a banquet at traditional events or traditional rituals in Tuban. This study is in line with the results of the study above, that environmental culture influences a person to consume alcohol. So although most people think that drinking wine is a negative habit, but the culture of drinking wine still persists in the community for the reasons stated above.

The policy factor does not significantly influence the culture of palm wine consumption in Bumi Wali Tuban. Research by Constantinescu, Maria, and Cornel Constantinescu, states that drinking alcohol behavior in addition to being influenced by personal choices is also influenced by the environment, for example legislation and friends. This study also states that to reduce the consumption of alcoholic beverages, several policies need to be carried out, including: 1) Limiting the number of days and hours of sale, the density of certain locations or places where alcoholic drinks are sold; 2) Limiting alcohol consumption in public places. Prohibition of alcohol in certain areas in the city and at certain times. Promote physical security and social order; 3) limiting alcohol marketing and promotional prices, especially marketing and promoting alcohol intended for young people; 4) Promote consumption of soft drinks, by setting prices lower than the cheapest alcoholic drinks; 5) restrictions on the sale of alcohol near schools\(^{(11)}\).

Explicitly, the regulation does not regulate traditional drinks containing alcohol such as wine. The Tuban District Government also does not prohibit the sale of palm wine. Because producing palm wine is one of the economic sources of citizens. To reduce the impact of excessive drinking there is an appeal from the government to sell wine in areas far from the crowd, so that people who are drunk do not make a fuss. Besides being a source of income, tuak is also a tradition that has been passed down in the community.

Economic factors do not significantly influence the culture of palm wine consumption in Bumi Wali Tuban. Rafferty, Ellen, in her study said that, as individual income levels increase, the estimated opportunities for engaging in alcohol consumption also increase. Individuals with higher incomes tend to drink more often than low income earners\(^{(14)}\). Sobhee’s research, S, also states that spending to buy alcohol by alcohol dependent individuals increases when income rises. Income is the main determinant of spending on alcohol by individuals who are alcohol dependent\(^{(10)}\).

The education factor significantly influences the culture of palm wine consumption in Bumi Wali Tuban. Rafferty, Ellen, in the results of the study stated that, individuals with less education than secondary school had a 1.09 times higher chance than individuals with education after secondary school\(^{(14)}\). Anamaria Ciubară’s research also states that the level of education also influences general attitudes toward alcoholism and alcoholism, subjects with higher education are far more aware of the negative effects of alcoholism than subjects with less educational levels\(^{(15)}\). Low education factor makes it difficult for someone to accept new information, in this case is information about wine and its effects, even though they argue that drinking wine is a negative habit.

**Conclusion**

The factor of cultural value and lifestyle is the most influential factor in the culture of consumption of palm wine, the cultural value and lifestyle has a 23.1 times chance for someone to drink wine. In accordance with Leininger’s Sunrise Model theory approach, what needs to be done is to help clients adapt to certain cultures that are more beneficial to health (negotiation) and cultural restructuring, namely by periodically providing counseling about the dangers of alcoholic beverages to the community in communities and adolescents in schools.

**Conflict of Interest:** There is no conflict of interest to be declared.

**Source of Funding:** None

**Ethical Clearance:** This study was approved by
the health research ethics commission Health Polytechnic Ministry of Health No. 155/S/KEPK/V/2018.

**References**

Personal Hygiene Relationship with Typhoid Fever Occurrence in Gowa Regency, Indonesia

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¹Associate Professor, ²Assistant Professor, ³Assistant Professor, ⁴Graduate Student, ⁵Environmental Health Department & the Center of Excellent on Urban Health of Health Polytechnic of Ministry of Health in Makassar, Indonesia

Abstract

Objective: The objective of this study was to determine the relationship of individual hygiene with the incidence of typhoid fever in the working area of Pallangga Health Center, Gowa Regency.

Method: The type of study used was observational analytic with a cross-sectional approach. The population in this study were all cases of suspect typhoid fever in the health center of Pallangga in the last 3 months with 104 cases. Subjects involved in this research were 83 patients were taken by simple random sampling. Data obtained, then analysed using SPSS for Windows with the Chi-square test.

Result: The results of this study were good handwashing habits before eating found over 38 subjects (45.8%) and 45 subjects (54.2%) with poor habits, good handwashing habits after defecation showed by 55 subjects (66.3%) and 28 subjects (33.7%) were showing poor habits while frequent out-of-home eating habits found over 58 subjects (69.9%) and rarely eating out of home showed by 25 subjects (30.1%).

Conclusion: This research found that there was a significant relationship between handwashing habits before eating (p=0.01) and eating habits outside the house (p=0.02), and statistically no significant relationship between handwashing habits after defecation (p=0.16) with the incidence of typhoid fever in the Pallangga Community Health Center Gowa District.

Keywords: Personal Hygiene, Typhoid Fever, Health Center.

Introduction

Typhoid fever is an acute infectious disease that is always in the community (endemic) in Indonesia, ranging from the age of toddlers, children and adults, even the elderly. Typhoid includes a systematic infection with typical symptoms of fever. The disease is endemic and becomes global health matter¹ and a public health problem from case studies in major hospitals in Indonesia, the rare cases of typhoid tend to increase from year to year with an average illness of 500/100,000 people with mortality rate between 0.6-5%.²

Typhoid is one of the endemic diseases in Indonesia, the majority cases were school-age children and productive age groups. This disease causes a high rate of absent in class, on average it takes 7-14 days to treat if someone is typhoid. If the treatment is not complete, it can lead to a career which then becomes a source of transmission for others.³

Data obtained from the South Sulawesi provincial health office in 2012 recorded 24,998 cases positive with typhoid fever, in 2013 typhoid fever was recorded at 31,633 cases with an incidence rate (3.8). In 2014

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typhoid was recorded at 16,743 cases, patients were 7,925 men and 8,818 women with incident rates (2.07), with the highest cases being in Bulukumba Regency (3,270 cases), Makassar City (2,325 cases) Enrekang Regency (1,153 cases) and the lowest in North Toraja district (0 cases), Luwu Regency (1 case) and Tana Toraja District 19 cases.4

The transmission of typhoid fever occurs through fecal-oral route, hygienic procedures play main role in prevention and control of the infection.5 Based on disease data from Pallangga Health Center, the number of typhoid fever cases was 104 cases in 2018. It was allegedly caused by housing factors including lack of toilet facilities that did not meet health requirements.

Method

This study was led in the working area of Pallangga Community Health Center, Pallangga District, Gowa Regency, covered 4 villages and 4 sub-districts. The independent variables were the habit of washing hands before eating, the habit of washing hands after defecation and out home eating habits behavior. The dependent variable was the occurrence of typhoid fever patients in the working area of Pallangga Health Center, Gowa Regency.

The population in this study were all patients with typhoid fever as many as 104 patients in the working area of Pallangga Health Center, Gowa Regency. The number of samples in this study was taken from a portion of the population determined using Random Sampling which was taken randomly as many as 83 patients with typhoid fever in the working area of Pallangga Health Center, Gowa Regency.

Data analysis was performed by using Software SPSS for Windows with Chi-square test, Microsoft Excell for processing and creating master table and Microsoft word for reporting this research.

Results

Hand-Washing Habits Before Eating and After Defecation:

Table 1. Frequency distribution of hand-washing habits before eating and after defecation.

<table>
<thead>
<tr>
<th>Hand-Washing Habits</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before eating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>38</td>
<td>46%</td>
</tr>
<tr>
<td>Poor</td>
<td>45</td>
<td>54%</td>
</tr>
<tr>
<td>After defecation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>55</td>
<td>66%</td>
</tr>
<tr>
<td>Poor</td>
<td>28</td>
<td>34%</td>
</tr>
<tr>
<td>Total</td>
<td>83</td>
<td>100%</td>
</tr>
</tbody>
</table>

Outdoor Eating Habits (stalls/street vendors):

Table 2. Frequency distribution of outdoor eating habits

<table>
<thead>
<tr>
<th>Outdoor Eating Habits</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Often</td>
<td>58</td>
<td>70%</td>
</tr>
<tr>
<td>Not often</td>
<td>25</td>
<td>30%</td>
</tr>
<tr>
<td>Total</td>
<td>83</td>
<td>100%</td>
</tr>
</tbody>
</table>

Relationship to Hand-Washing Habits Before Eating with the Typhoid Fever:

Table 3. Relationship to hand-washing habits before eating with the occurrence of typhoid fever

<table>
<thead>
<tr>
<th>Hand-washing habits before eating</th>
<th>Typhoid Cases</th>
<th>Total</th>
<th>%</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>11</td>
<td>13%</td>
<td>27</td>
<td>33%</td>
</tr>
<tr>
<td>Poor</td>
<td>30</td>
<td>36%</td>
<td>15</td>
<td>18%</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>49%</td>
<td>42</td>
<td>51%</td>
</tr>
</tbody>
</table>
Relationship of Hand-Washing Habits After Defecation with the Typhoid Fever:

Table 4. Relationship of hand-washing habits after defecation with the occurrence of typhoid fever

<table>
<thead>
<tr>
<th>Hand-washing habits after defecation</th>
<th>Typhoid Cases</th>
<th>Total</th>
<th>%</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Good</td>
<td>22</td>
<td>27%</td>
<td>33</td>
<td>40%</td>
</tr>
<tr>
<td>Poor</td>
<td>19</td>
<td>23%</td>
<td>9</td>
<td>11%</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>49%</td>
<td>42</td>
<td>51%</td>
</tr>
</tbody>
</table>

Relationship Between Outdoor Eating Habits with the Typhoid fever:

Table 5. Relationship between outdoor eating habits with the occurrence of typhoid fever

<table>
<thead>
<tr>
<th>Outdoor eating habits</th>
<th>Typhoid Cases</th>
<th>Total</th>
<th>%</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Often</td>
<td>6</td>
<td>7%</td>
<td>19</td>
<td>23%</td>
</tr>
<tr>
<td>Not often</td>
<td>35</td>
<td>42%</td>
<td>23</td>
<td>28%</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>49%</td>
<td>42</td>
<td>51%</td>
</tr>
</tbody>
</table>

Discussion

Hand-washing habits before eating: Personal hygiene in this study was related to typhoid fever cases. These include the habit of washing hands before eating, using soap, and cleaning nails. The incidence of typhoid fever often occurs in slums, low socio-economic environments, unhygienic states and people with poor personal hygiene.

Based on crosstabulation among variables to find out the relationship between handwashing habits before eating and the incidence of typhoid fever in the working area of Pallangga Gowa Health Center, the results were 38 subjects who had good handwashing before eating seen 11 subjects who positive typhoid fever and 27 subjects who negative of typhoid fever. While from 45 subjects who had the habit of washing hands before eating less well, it was found that 30 subjects positive of typhoid fever and 15 subjects who negative of typhoid fever.

The results of bivariate statistic analysis using the Chi-square test obtained p-value=0.01<α=0.05 meant H0 was rejected and Ha was accepted implied that there was a significant relationship between handwashing habits before eating and the incidence of typhoid fever. This was in line with the research which states that there was a significant relationship between handwashing habits before eating and the incidence of typhoid fever in the working area of Tumaratas Health Center and research explaining that someone who practices hand washing before eating less well at risk 3 times to experience the incidence of typhoid fever.

It was also said that personal hygiene is one of the efforts that can prevent the occurrence of typhoid fever because the transmission media of germs that cause typhoid fever move and cause transmission could be directly or indirectly.

Based on the results of observations and interviews conducted in the working area of the Pallangga Community Health Center, Gowa Regency found that there were 45 subjects who had poor handwashing habits that only washed their hands before eating by water without soap and not rubbing their hands, between fingers, and nails. So this is what can lead to the development and as a source of transmission of typhoid fever.

The water source for hand washing before eating is the dug well, the results of observations of dug well water, which were tasteless, odorless, and colorless, when viewed from the results of physical observations
Personal health is a very important thing for someone to have a health condition, only each person can condition it. Healthy conditions can be obtained if each person behaves clean and healthy. For example, if a person is not clean in caring for his body, then his health will be disrupted and will cause illness. The participation of related institutions (health center) is also needed in order to foster good personal hygiene behavior for the subjects, the thing that can be done is to do empowerment, health promotion, and water quality checks.

**Hand-washing habits after defecation:** Based on crosstabulation to find out the relationship between hand washing habits after defecation and the incidence of typhoid fever in the work area of Pallangga Gowa Health Center, the results were 55 subjects who had good handwashing after defecation found 22 subjects positive of typhoid fever and 33 subjects negative from typhoid fever. While 28 subjects who had a poor habit of washing hands after defecation, it was found that 19 subjects positive of typhoid fever and 9 subjects negative of typhoid fever.

The results of the bivariate analysis using the chi-square test obtained p-value = 0.16 > α = 0.05 so H0 was accepted and Ha was rejected by the conclusion that there was no significant relationship between handwashing habits after defecation and the incidence of typhoid fever.

Poor hand washing habits after defecation are likely they are not attacked by typhoid fever because their stool does not contain Salmonella typhi, or there is Salmonella Typhi but is dead, or there are still living Salmonella Typhi but in insufficient amounts to infect, or there are Living Salmonella thypi in sufficient quantities to infect but not actually enter the body. This causes the habit of washing hands after defecation in this study is not a risk factor for the incidence of Typhoid Fever in the working area of the Pallangga Health Center, Gowa Regency. It’s very important to maintain the availability of water and soap for handwashing at the toilet after defecation for diminishing improper handwashing.8

**Outdoor Eating Habits:** In food handlers who do not pay attention to their personal hygiene, especially food handlers, they must always pay attention to and maintain their cleanliness. The incidence of typhoid fever often occurs because someone more often eats outside the house without us knowing the cleanliness of the food and food handlers who could suffer from typhoid fever which can transmit bacteria through these foods.

Based on crosstabulation to find out the relationship between eating habits outside the house and the incidence of typhoid fever in the Work Area of Pallangga Gowa Health Center, the results were 58 subjects who had the habit of eating outdoors often from 35 subjects who suffered typhoid fever and 23 subjects did not suffer from typhoid fever. Whereas from 25 subjects who have eating habits outside the house that are not often done it is known that 6 subjects suffered from typhoid fever and 19 subjects who did not suffer from typhoid fever.

Based on table 5.6 the results of the bivariate analysis using the chi-square test obtained a value of P = 0.02 < α = 0.05, so Ho was rejected and Ha value was accepted by the conclusion that there was a significant relationship between eating habits outside the home with the incidence of typhoid fever. This is in line with research9 who said that there was a significant relationship between eating habits outside the home with the incidence of typhoid fever in the working area of Tegal Pagiyanten Health Center and also in line with research10 found that there was a significant relationship between eating habits outside the home with the incidence of typhoid fever in the Ngemplak Community Health Center Working Area in Boyolali Regency. Stating that those who have eating habits outside the home are at a greater risk of 2,625 times getting typhoid fever compared to someone who has a good habit of eating and drinking at home.

It was also said that the transmission of typhoid fever can occur anywhere and anytime usually occurs through the consumption of food outside the home or in public places if the food and drink are consumed less cleanly. It can also be caused because the food is served by a typhus case who lacks hygiene while cooking and can also be caused by latent typhoid (hidden) patient who lacks cleanliness while cooking. A person can bring typhus in his digestive tract without pain, this is also called latent case. These cases can transmit typhus to many people, especially if he works in serving food to many people such as cooks in restaurants.

In addition, when eating outside, especially in public places there are usually flies that fly everywhere and even land on food. These flies can transmit Salmonella
Typhi by means of flies previously perched on feces or vomiting typhoid fever patients then perch on the food to be consumed.

Health efforts that must be done are to provide knowledge to the community by counseling the public about controlling the incidence of typhoid fever. One of them is not to get used to eating outside the house, which is the stalls/peddlers who are not guaranteed to be clean and provide advice to traders to always maintain the cleanliness of their merchandise both from washing tools, materials and up to the supply of food.

Typhoid fever is a disease caused by Salmonella Typhi infection in the small intestine and bloodstream. These bacteria mix in dirty water or milk and infected food.

Typhoid transmission can occur in various ways, known as 5F, namely food, fingers, fomites, fly, and feces. These germs can be transmitted contaminated drinks and through intermediates of flies, where flies will be eaten by those who are healthy.

Salmonella thypi from the newly infected human mouth goes to the stomach, some germs will be destroyed by gastric acid (HCl) and some pass through to the distal small intestine (the intestine can irritate) and release endotoxins causing the blood to contain bacteria (bacteremia) primary, then through the bloodstream and lymphoid tissue to the lymph and liver. In this lymphoid tissue germs multiply, then enter the bloodstream and reach other organs, especially the small intestine so that inflammation occurs which causes malabsorption of nutrients and intestinal hyperperistaltic resulting in diarrhea. Fever is caused by salmonella and endotoxin stimulates the synthesis and release of pyrogens by leukocytes in inflamed tissue.

**Conclusion**

Based on the study that has been carried out, we found that there was a significant relationship between handwashing habits before eating and eating habits outside the home with the incidence of typhoid fever. Even though, we fail to found a significant relationship between the habit of washing hands after defecation with the incidence of typhoid fever.

Based on the results of the conclusions above, the authors suggest that all people have to maintain a clean and healthy lifestyle in all fields, get used to washing hands before eating, after defecating and reducing outdoor eating habits. It is recommended for the health center to work with the people in optimizing The Clean and Healthy Behavior program to improve the optimization of personal hygiene behavior in order to create community health and well-being in the work area of the health center and provide health education to the community.

It is better for future researchers to conduct further research regarding other factors such as (knowledge, attitudes, sources of clean water, history of typhoid family members and individual characteristics) that are associated with the incidence of typhoid fever.

**Conflict of Interest:** There was no conflict of interest regarding this study and publication.

**Ethical Clearance:** This study has been ethically approved and allowed by the Regional Investment and Coordination Board of South Sulawesi in Makassar.

**Source of Funding:** No Funding source regarding this research. All costs were funded by researchers team.

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The Analysis on Input and Process to K4 Achievement in Bondowoso District

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³Department of Public Health, Faculty of Dentistry, University of Jember, East Java (Indonesia)

Abstract

Introduction: K4 achievement was referred to a specific coverage of pregnant mother who have achieved to antenatal service which according to the standard, at least four times in a region during particular period of time. In Bondowoso District, the achievement of K4 was 82.7%, thus, Bondowoso District has not fulfilled to the target plan achievement which has been established by East Java Government in about 88%.

Objective: To analyze effects of input and process to the achievement of K4 in Bondowoso District.

Method: Quantitative research and cross sectional approach. The sample of research was taken from all midwives who have implemented K4 achievement in Bondowoso District as many 190 midwifes. The data analysis was multiple linear regression. Findings: This research demonstrated to a significant effect between input and process to K4 achievement.

Conclusion: The variables of input (man, money, and materials) and process (organizing, actuating, and controlling) were factors which affected to the achievement of K4, therefore, it was suggested to the Office of Bondowoso District to concern more on the indicators of either input or process as knowledge on Human Resource, and facilities and infrastructures which were provided to the midwifes as the executor or implementer of K4 achievement.

Keywords: Input, Process, and K4 Achievement.

Introduction

The problem of health development in Indonesia was detected on the high rate of maternal mortality and infant mortality. Based on Khan’s Low birth weight remains associated with key indicators not just of maternal poverty (notably adequate maternal education) but also markers of structural poverty in health care (notably quality ANC)[6]. In Indonesia, this health problem was ranked on the second in Southeast Asia, specifically for the maternal mortality rate after Laos with the percentage 305 of 100 million in last 2015. A causal factor from this problem of maternal mortality rate was not maximal first screening and prevention attempt in the pregnancy complication during pregnancy test (ANC), particularly on K4 achievement which has not complied to the plan target 2017-2022. According to Department of Health of Republic Indonesia 2010, the pregnancy test (ANC) was a health service which given to pregnant mother during pregnancy period due to the established standard of pregnancy test service. The pregnancy test (ANC) could be exerted as the first screening to the baby condition. Based on the survey from Riskesdas 2018, the health service on pregnant mother in Indonesia has two indicators of SDGs which would be derived
from the achievement of ANC, as K1 (ANC1) and K4 (ANC 4). K4 was the fourth or more contact of pregnant mother to the health officer to get pregnancy test service according to the standard, in minimum of four times of pregnancy test service with the frequency of once visit in first trimester (14 weeks), once visit in second trimester (in range of 14-28 weeks), and two times visit in third trimester (in range of 28-36 weeks)\[12\]. The achievement of K4 in Indonesia has not fulfilled to the plan target in 2018, 2,1% from the target of strategic plan in 2018 78%, while the achievement of K4 in Indonesia has reached to 75,9% in 2019. The achievement of K4 in East Java has reached 90,5%\[3\]. In Bondowoso District, K4 achievement 83,5%, therefore, Bondowoso District has not complied to the target of strategic plan which has been established by the Government of East Java in about 88%. Bodowoso District has target of K4 strategic plan 95%, and in fact, Bondowoso District has not fulfilled the strategic plan target as many 11,5% in 2018. From the total of 25 puskesmas in Bondowoso District, there were no one which could comply the achievement target of strategic plan K4 in Bondowoso district\[4\].

The factor which could affect the success of strategic plan achievement of K4 was aspect of input, man (human resource). The variable of man which was referred by the researchers, the midwife who have implemented K4 achievement which considered from aspects of age, educational background, period of service, knowledge, and training\[7\]. Money or fund source (material) in this context was facilities and infrastructure as supporting tool and material availability which could be very influential to the success of K4 achievement program. Next, the process also has a significant role to follow up the input, thus, the process has some indicators which could affect this research, as organizing, actuating, and controlling. Besides those three indicators, another factor which could affect the research problem was environment which was influenced by level of education, occupation, social economic, and social characteristics of society which was influenced by family support, role of health officer, village apparatus support, public figure, and religious figure\[12\].

This research aimed to analyze the effects of input and process to the achievement of K4 in Bondowoso District.

Method

This research exerted design of analytic observational and method of cross sectional approach. This research employed multivariate method in medium of SPSS 22. The population of this research was 190 midwives who have practiced K4 achievement program in Bondowoso District. The technique of data sampling in this research was total sampling. The total sampling referred to a technique of data sampling where the total of sample was similar to the population\[9\], therefore, the sample of research were all the midwives who have implemented K4 achievement in Bondowoso District as many 190 midwives. The variable of research was consisted of independent variable as input and process and dependent variable as K4 achievement. The instrument of data collection in this research was questionnaire. Next, the collected data would be analyzed through multiple linear regression method.

Research Findings: The result of analysis exerted multiple linear regression in this research would be presented into three sections, the first was respondent characteristic and the second was validity and reliability test, while the third one was analysis result.

Respondent Characteristics:

Table 1. Respondent Characteristics

<table>
<thead>
<tr>
<th>Respondent Characteristic</th>
<th>Classification</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>20 - 30 years</td>
<td>34</td>
<td>17.89%</td>
</tr>
<tr>
<td></td>
<td>31 - 40 years</td>
<td>78</td>
<td>41.05%</td>
</tr>
<tr>
<td></td>
<td>41 - 50 years</td>
<td>56</td>
<td>29.47%</td>
</tr>
<tr>
<td></td>
<td>51 - 60 years</td>
<td>22</td>
<td>11.58%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>190</td>
<td>100.00%</td>
</tr>
</tbody>
</table>
Based on the table 1 above, it was identified that from 190 respondents, as many 63.68% or 121 respondents from the graduate of DIII (Diploma Program) and 26.32% or 69 graduates of D4/S1 degree. The age of midwife in Bondowoso District who have implemented K4 achievement program, the respondents in age range 20-30 years old 17.89%, or approximately 34 respondents, age range 31-40 years old 41.05% or approximately 78 respondents, age range 41-50 years old 29.47% or approximately 56 respondents, and age range 51-60 years old 11.58% or approximately 22 respondents. The majority of respondents were the midwives who have work experience along 1-8 years as many 55 midwives or 28.95.

Validity and Reliability Test: The validity test was aimed to clarify how great the validity and accuracy of an instrument to employ its function. To test the validity of research, the researchers used instrument of product moment pearson’s correlation where they must correlate each statement to the total score, and then the correlation result was compared to the critical number 0.30[5].

Whilst, the reliability test was aimed to test how far the result of measurement was relatively consistent. The good statement referred to a clear statement which was easily understood and has similar interpretation, although it was conveyed to the respondents in different way and different period of time. Further in this research, the reliability test was employed through Cronbach Alpha and this research instrument was considered as reliable, since it delivered to Cronbach Alpha value more than 0.60[8].

<table>
<thead>
<tr>
<th>No.</th>
<th>Item Description</th>
<th>$R_{cal}$</th>
<th>Explanation</th>
<th>Cronbach Alpha</th>
<th>Clarification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(Man/Knowledge) X1.1</td>
<td>0.645</td>
<td>Valid</td>
<td>0.789</td>
<td>Reliable</td>
</tr>
<tr>
<td></td>
<td>(Man/Training) X1.2</td>
<td>0.782</td>
<td>Valid</td>
<td></td>
<td>Reliable</td>
</tr>
<tr>
<td></td>
<td>(Money) X1.3</td>
<td>0.716</td>
<td>Valid</td>
<td></td>
<td>Reliable</td>
</tr>
<tr>
<td></td>
<td>(Materials) X1.4</td>
<td>0.733</td>
<td>Valid</td>
<td></td>
<td>Reliable</td>
</tr>
<tr>
<td>2</td>
<td>Organizing (X2.1)</td>
<td>0.822</td>
<td>Valid</td>
<td>0.724</td>
<td>Reliable</td>
</tr>
<tr>
<td></td>
<td>(Actuating) X2.2</td>
<td>0.787</td>
<td>Valid</td>
<td></td>
<td>Reliable</td>
</tr>
<tr>
<td></td>
<td>(Controlling) X2.3</td>
<td>0.798</td>
<td>Valid</td>
<td></td>
<td>Reliable</td>
</tr>
<tr>
<td>3</td>
<td>Y</td>
<td>0.783</td>
<td>Valid</td>
<td>0.737</td>
<td>Reliable</td>
</tr>
</tbody>
</table>

Based on the table 2 above, it was referred that each indicator has $R_{cal}$ value which was greater than 0.30. It indicated that the indicators which were used in this research variables were said as reliable or valid to collect the data. Moreover, the testing result showed that each variable has Cronbach Alpha value more than 0.60. Thus, it was concluded that all variables in this research were reliable.
Analysis Result

a. T Test (Partial Hypothesis Test): The hypothesis of input and process in this research was tested its validity through partial test. This type of testing was aimed to see significant level (p-value), if the result of significance level from the calculation was fewer than 0.05, then, the first hypothesis was approved, on the other hand, if the result of significance level was greater than 0.05, thus, the hypothesis was disapproved.

According to the result of hypothesis testing on input variable, it was indicated that t cal value 6.472 and significance level 0.021. This significance level was fewer than 0.05, which referred that the variable of input has positive effect to the achievement of K4 in Bondowoso District. The variable of process indicated t cal value 9.346 and significance level 0.013. This significance level was fewer than 0.05, which referred that it has positive effect to the achievement of K4 in Bondowoso District.

b. F Test (Simultaneous Hypothesis Test): To test the independent variable simultaneously, the researchers tested through F test. Next, the result of statistic calculation who wed that F cal value = 153.474. By exerting the significance level 0.05, it was derived that the significance level was fewer than 0.05. It referred that the hypothesis has stated that the variable of input and process have effects simultaneously to the achievement of K4 in Bondowoso District.

c. Determinant Coefficient (R): The determinant coefficient was a scale which indicated the variation size of dependent variable which could be explained by the independent variable. The value of determinant coefficient was determined by the value of adjusted R square.

The result of regression calculation showed that the determinant coefficient (adjusted R2) 0.792 or 79.2%, which referred that the variable variation of K4 achievement in Bondowoso District could be explained by the variable of input and process. While, the rest 20.8% was explained by other variables which were not submitted in this research.

Discussions

Based on the research finding, it showed that the majority of midwives as the implementers of K4 achievement program have age, educational level, and service period which were categorized into stable and consistent stage of career development, besides, the indicators as input (man, money, and materials) and process (organizing, actuating, and controlling) have positive effects to the achievement of K4[1]. K4 achievement was referred as a form of assessment on the level of health development which must be implemented by Health Office of Bondowoso District as an attempt to improve K4 program achievement through visit service ANC 1 (K1) and visit ANC 4 which was optimally according to the minimum standard of service. The indicators of K4 achievement was the implementation of ANC 4 (the fourth pregnancy test by health officer). Moreover, the continuous treatment must be conducted by identifying the variable of input (man, money, and materials) and process (organizing, actuating, and controlling) which was executed by the service provider in order to realize the achievement of K4 which complied the strategic plan target in about 95%[11].

This research finding was in line with the theory stated by Tampubolon, the implementation of health program was not apart from its health management system, as input, process, and output. The administration input was valued as all things that were needed to implement administration task[10]. Within this input, it required to management unsure: 4M (Man, Money, Material, and Method)[2]. Next, process was referred as steps which must be taken to achieve goals. According to G.R Terry in Satrianegara (2014), there are four functions of administration in the process, but the researchers only employed three functions of administration in this research, as organizing, actuating, and controlling[1]. The organizing step was identified from the availability of implementer or midwife and organizational structure who perform K4 achievement. Actuating was seen from the implementation of K4 visit according to the standard operational of implementation.

The research done by Sulistiyani (2016) has supported to this research finding that the evaluation of implementation of K4 achievement service in Puskesmas Jakenan was due to the system approach and covered to human resource, thus, the implementation of K4 achievement service was less and output was not achieved[12]. Moreover, the research done by Titiwiarti 2013 has also demonstrated that the scope of antenatal visit (K4) was caused by lack of facilities and infrastructures, fund availability which has not fulfilled to the service need, not maximal recording and reporting which caused to not optimal visit achievement[14].
Based on the result of statistic testing, it was clearly identified that the independent variables were related to the dependent variable. The relation which given by the independent variables was positive, which referred that the relation of both variables was in the same direction. Therefore, the relation was positive as long as the independent variables were increased, the dependent variable would also increase as well. In short, the better variable of input and process would affect to the higher achievement of K4 program in Bondowoso District.

Next, the main problems which could emerge during the implementation of K4 in Bondowoso district was the limited resource, from either the aspect of facility and infrastructure or funding that have been established by Puskesmas or Health Office of Bondowoso District. Moreover, the geographical aspect of Bondowoso District where was surrounded by hills was also the problem for the health officer or midwife to conduct socialization concerning to K4 achievement. Further, the signal trouble of difficulty which was experienced by midwife who was on duty in the suburbs of district, for instance Sub-district of Ijen, Tlogosari, Wringin, and Tamankrocok.

It was also suggested to the Health Office of Bondowoso District to conduct monitoring and evaluation to the implementation of K4 in suburbs of district, in order to get the problems of health officer including to the provision of facility and infrastructure which functioned to support the health officer to provide service. In addition, it also needed to some trainings in continuous by the officer of K4, especially in particular regions which did not comply the strategic plan target of Health Officer of Bondowoso District and Government of East Java.

Conclusions

Based on the result of data analysis, this research showed that the variable of input (man, money, and materials) and process (organizing, actuating, and controlling) affected positively and significantly to the achievement of K4 in Bondowoso District. However, based on the report of K4 achievement in Bondowoso District, it has not fulfilled yet to the strategic plan target in the district level or East Java Province. Although, all inputs and processes have obeyed to the standard operational of service according to Permenkes 97. This condition was not referred to bad capability of human resource to serve the clients according to the standard operational, but there were some external factors that could affect to K4 achievement, so it could not fulfill yet to the target of strategic plan. The external factor was geographical problem which was mostly found by the health officer or midwife in suburbs as well as mountain area in Bondowoso District. Moreover, the limited access of signal or network in some regions might also cause to the lateness on process of information reception and submission of activity report.

Conflict of Interest: Nothing

Source of Funding: Self

Ethical Clearance: This research has undergone ethical test in ethics commission of health research of Faculty of Dentistry, University of Jember in this following registration number 354/UN25.8/KEPK/DL/2019.

References

Demineralisation Resistance by Bonding Agent Containing Calcium Oxide-Nanoparticles

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Abstract

Aim: This study aimed to quantify the effectiveness of bonded Calcium oxide (CaO)-nanoparticles as a demineralisation inhibitor.

Methodology: Twelve specimens of enamel were subjected to demineralisation-remineralisation cycles following the application of a bonding agent with or without CaO-nanoparticles. Calcium (Ca), and phosphorus (P) contents were evaluated utilising energy-dispersive X-ray spectroscopy (EDS). An independent sample t-test was performed to examine the statistical difference between CaO group and control one.

Results: The CaO group showed higher Ca wt% (67.59 ± 1.68) than the control group (65.22 ± 0.47) with significant difference (p = 0.017).

Conclusion: Application of bonding agent containing CaO-nanoparticles could enhance the enamel resistance against cariogenic challenge.

Keywords: Enamel, CaO-nanoparticles, bonding agent, recalcification.

Introduction

Enamel is the most mineralised and hardest tissue of the human body. Its hardness is mainly attributed to its composition. It is composed essentially of inorganic materials; approximately 95-98% of it is Ca and phosphate (PO₄³⁻) ions that form hydroxyapatite crystals. Organic materials are roughly made up 1-2% of enamel composition, containing enamel-specific protein named enamelin, which possesses a pronounced affinity for hydroxyapatite crystals binding. The reminder composition of enamel is made up of water, which accounts for about 4%. Enamel constituents are highly organised; millions of hydroxyapatite crystals are organised in thin, elongated structures (4-8 µm) called rods. The number of rods ranges from 5 million to 12 million. Each rod is surrounded by a sheath made up of protein[1-3]. The area between rods (inter-rod enamel) has the crystal of different orientation from that of enamel rods. Small spaces free of crystals exist between rods, called pores. They contribute to the permeability of enamel that allows diffusion and fluid movement to occur, but also varies the density and hardness of tooth, which can produce vulnerable sites which are more susceptible to demineralisation where pores enlarge and crystalline structure shrink in size[3,4].

Dental demineralisation and remineralisation are dynamic processes coexisted in a balance throughout life. When the demineralisation outweighs remineralisation, the mineral contents of the dental tissue dissolve, starting...
When the remineralisation outweighs demineralisation, the caries is reversed, and the demineralised tissue is remineralised\[^{5,6}\]. A dental filling has been applied to repair dental caries. Nevertheless, secondary caries frequently developed at the restoration tooth interface. Moreover, tooth restoration might need to be changed due to material deterioration, crack, or fracture. Therefore, it is a significant challenge for preventive and operative dentistry to induce the remineralisation of hypomineralised caries lesion. The remineralisation of demineralised dental tissue is the process of mineral restoration\[^{7}\]. Remineralising agents are available in many forms, such as fissure sealants, restorative materials, mouth rinses, chewing gums, and dentifrices\[^{8,9}\].

With the invasion of nanotechnology, some researchers have examined the application of nanoparticles in preventive and restorative dentistry. Recently, the application of nanotechnology in the science of dentistry has grabbed significant attention. Nanoparticles are materials with particles size ranging between 1 and 100 nm, possessing special physicochemical features and a wide range of uses encompassing pharmaceutical applications. The nanoparticles-based formulation for localised delivery in the oral cavity can be existing as aqueous suspensions, or it could be incorporated into the constituents of a gel or paste\[^{10-12}\].

Calcium is the most significant natural constituent of teeth. Thus, many calcium derivatives have been expressed great potentials to be applied in teeth related disorders due to their biocompatibility and biodegradability\[^{13}\]. Calcium, fluoride, and phosphorus ions play a vital role between remineralisation and demineralisation processes and subsequently modify the progression of dental caries\[^{14}\]. Adhesive systems containing calcium compound as calcium chloride or calcium phosphate were previously investigated. Shinkai et al. examine the effect of adding calcium chloride on microtensile bond strength, where an adverse effect was recorded\[^{15}\]. In another study, Shinkai added calcium phosphate to a bonding agent with a non-significant effect for the addition on the result\[^{16}\].

Calcium oxide is a significant inorganic material with a variety of employments across industrial\[^{17}\] and dental application\[^{18}\]. To date, no researches have been performed to study the synthetic CaO-nanoparticles as demineralisation inhibitor. Thus, the aim of this study was to investigate the effectiveness of bonding agent containing this nanoparticles preserve the surface mineral content against cariogenic challenge. The null hypothesis was: there would be no statistically significant effect for CaO-nanoparticles on the mineral contents of enamel.

### Materials and Method

**Calcium oxide-nanoparticles suspension preparation:** Calcium oxide nanoparticles were prepared according to a method described by Al-Shaibani et al.\[^{19}\]. CaO suspension was prepared by adding 10 ml of distal water to 50 mg of CaO-nanoparticles powder, and it was shacked very well prior to the using. A good mixing was achieved before using for the two suspensions.

**Artificial cariogenic solution and saliva preparations:** An artificial cariogenic agent of 4.6 pH, and a solution of artificial saliva containing remineralising agents were prepared according to the procedure described by Ou et al.\[^{20}\].

**Sample preparation:** Twelve enamel samples were prepared from anonymised impacted third molars to be used in this study. Ethical approval for this study was performed by the Ethical Committee of University of Kufa (reference number 7 in 05/03/2018) which was obtained according to the ethical standards and Declaration of Helsinki placed in the 1964 and its later amendments. Any specimens with crack, a sign of hypocalcification or defect were discarded.

All the crowns were sectioned coronally at the cemento-enamel junction. Each crown was positioned into moulds with the buccal surface facing down (base) and fixed in place with sticky wax to be mounted in an acrylic resin. After setting, the blocks were removed from the moulds, and each base was ground and polished to create a flat enamel surface. The selected specimens were randomly divided into two groups according to the received treatment:

**Control group:** The samples were treated with 37% phosphoric acid and after that were coated by bonding agent (Tetric N-Bond, Ivoclar Vivadent, Switzerland).

**CaO group:** The samples were treated with 37% phosphoric acid followed by a coating material composed of a combination of one drop from each of CaO suspension and Tetric-N bonding agent.
All the coating materials were cured by light cure device for 10 s, then subjected to demineralisation-remineralisation cycles. Each cycle involved sample immersion in the artificial cariogenic solution for 1 h, followed by immersion in the artificial saliva for 11 h. The two solutions were changed daily. Throughout the period, samples were at 37 °C under 100% relative humidity.

**SEM-EDS examination:** Post-treatment mineral contents of the enamel samples were measured as wt% of Ca and P. The samples were dehydrated with a series of ethanol concentrations: 50%, 75%, 90% and 100% respectively, for 20 minutes for each concentration, to remove any remnant of water.

Then, they were coated with 24 nm gold layer using Sputter Coater (Quorum technologies Ltd, Laughton, East Sussex, England). The elemental analysis was accomplished using SEM-EDS (Inspect S50, Netherland) at 12 kV accelerating voltage, 10.0 mm working distance and 5000x magnification. Four spectrums were taken for each sample, and then the average of the readings was calculated. During the elemental analysis, the incoming kV must be at least 2 times higher than any peak of a measured element [21]. The accelerating voltage in this study was 12 kV, which is larger than the energy of the electron shells of the measured elements.

**Statistical analysis:** Mean and standard deviations were calculated, and the data were checked for normal distribution by Shapiro-Wilks test. The effect of mineralising agents on the chemical composition of enamel (Ca%, and P%) was analysed by Independent Sample t-test using SPSS version 22.0 (IBM Corp., Armonk, US) at a confidence level of 95%, and \( p \leq 0.05 \).

### Results

The result of the data analysis obtained by EDS for two groups is summarised in Table 1. Mean and standard deviation for the enamel surface elemental analysis of experimental groups. A significant increase in Ca contents of CaO group compared to the control group was reported (\( P\)-value = 0.017). For CaO group, the relative content of P was lower than the control group. However, the difference was statistically non-significant (\( P\)-value = 0.129).

<table>
<thead>
<tr>
<th>Group</th>
<th>Ca wt%</th>
<th>P wt%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group</td>
<td>65.22 (0.47)</td>
<td>32.39 (0.10)</td>
</tr>
<tr>
<td>CaO group</td>
<td>67.59 (1.68)</td>
<td>31.54 (1.05)</td>
</tr>
<tr>
<td>( P)-value</td>
<td>0.017</td>
<td>0.129</td>
</tr>
</tbody>
</table>

The Ca wt% and P wt% were presented as mean, standard deviation (SD) and \( p\)-value of the independent samples t-test.

### Discussion

This study has quantitatively evaluated the remineralisation potential of CaO-nanoparticles on enamel surface subjected to cariogenic challenge. SEM-EDS was utilized to record the structural changes of enamel surface (Ca wt%, and P wt%). This methodology was similar to that used by previous studies [22, 23]. In the current experiment, the impacted third molars were used for the aim of standardisation and to avoid the effect of variation in the teeth chemical composition.

Remineralisation is a repair process for non-cavitated lesions. For the remineralisation enhancement, the increase of Ca concentration in the oral fluids would seem reasonable. Calcium containing compounds rather than phosphate were widely used as a remineralising agent like calcium silicate [24] and Calcium carbonate [25]. In fact, Ca considered as one of the key minerals for remineralisation process [26].

The present *in-vitro* study mainly demonstrated a remineralising potential of CaO-nanoparticles. A significant increase in the relative amount of surface Ca content as a result of the application of CaO-nanoparticles was reported in this study. These results were logical, and the rationale for that is CaO-nanoparticles possess Ca in its chemical composition. Mixing of CaO with water resulted in the production of calcium hydroxide [27], which was proved to be an effective remineralising agent [28]. It was stated that, in the presence of biological fluid, the calcium hydroxide permitting the development of biological apatite [24]. On the other hand, the use of a bonding agent may be an effective method to fill porous spaces in demineralised tissue and enhancing remineralisation by containing CaO-nanoparticles.
The Ca-rich media would enhance Ca enamel uptake, rise chance of remineralisation. The increase in Ca wt% in the CaO group reflect the incorporation of the Ca and regrowing of the hydroxyapatite crystals. It was reported that during the demineralisation process, the Ca loss preceding that of P \[29\]. Therefore, using of Ca-rich agent for the demineralisation suppression would be efficient. According to the present result, the applied null hypothesis was rejected.

One of the limitations in the current study is the expected differences in the mineral contents of the samples, which might have referred to differences in original contents. However, the selection of teeth of similar criteria with random allocation of the samples to groups makes sure these differences had a minimal effect.

**Conclusion**

Despite the limitations, and depending on the data obtained from the current study, we able to demonstrate that the CaO-nanoparticles could enhance enamel resistance to cariogenic attack.

**Acknowledgements:** The authors wish to thank Dr. Wasnaa Al-Baghdadi from University of Kufa/Faculty of Dentistry at the department of basic sciences for her help in material preparation.

**Conflict of Interest:** None

**Funding:** Self

**Ethical Clearance:** Not required

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Environmental and Personality Influences on Nurse Discipline Public Health Center

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Abstract

Introduction: Discipline is a benchmark to find out whether the role of a manager or leader as a whole can be implemented well or not.

Method: This research is a quantitative study supported by qualitative data with cross-sectional study design.

Results: The test with the chi-square test of personality and environmental factors obtained a p-value of 0.827 that Ha was rejected and H0 was accepted so that there was no influence between personality and environmental factors on the discipline of nurses in Barombong Public Health Center, Makassar.

Conclusion: There is no influence between personality and environmental factors on the discipline of nurses in the Makassar City Barombong Health Center. This research can be used as a reference material for learning about nurse discipline and is expected for health workers to be used as input for carrying out their duties.

Keywords: Discipline, Personality, Environment.

Introduction

World Health Organization (WHO), that in order to improve the performance of nurses both in the enforcement of discipline of nurses must be able to provide comfort and satisfaction to nurses as an appreciation for the performance they do. Based on medical record data obtained at the Makassar City Barombong Health Center, that the total number of nurses is 124 people(1,2).

Nurses as one of the important assets in the management of health facilities in hospitals and health centers have a very important role, other than as paramedics to treat patients, because of these very important tasks, nurses should have a high work discipline, for example about work discipline is associated with risks that may occur, for nurses who are not disciplined delays in handling patients (even in seconds) will greatly jeopardize the safety of patients’ lives(3).

Discipline is a matter of benchmarks to determine whether the role of a manager or leader as a whole can be implemented properly or not. Nursing is one of the professions in hospitals and dipuskesmas that plays an important role in the implementation of efforts to maintain the quality of health services in health centers and hospitals. Health services at puskesmas are a form of service provided to clients, by a multi-disciplinary team including the nursing team. The nursing team is a member of the health team that faces client health problems for 24 hours continuously(4).
Public health center has a role in efforts to improve the highest public health. In an effort to achieve the degree of public health, Public health center and hospitals organize affordable and quality health services for the community\(^5\). To improve services, one important factor that must be considered by hospitals and health centers is Human Resources (HR). Explain that the success of an institution is determined by two main factors, namely Human Resources or Labor and supporting infrastructure or work facilities. People who work or become members of an organization called personnel, employees, employees, workers, labor, and others\(^6,7\).

**Material and Method**

This study uses quantitative research method supported by qualitative data with a cross sectional or cross sectional research design, where the independent variable (the influencing variable) and the dependent variable (the affected variable) are measured and observed at the same time. The sample in this study amounted to 50 respondents. with cross sectional or cross sectional research design, using non-rundem sampling method with criteria determined by researchers.

**Findings:**

Table 1. Personality Factor Analysis of Nurses’ discipline at the Makassar City Barombong Health Center

<table>
<thead>
<tr>
<th>Personality Factor</th>
<th>Discipline</th>
<th>Total</th>
<th>Value p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
<td>Not Good</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>47</td>
<td>0</td>
<td>47</td>
</tr>
<tr>
<td>Not Good</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>3</td>
<td>50</td>
</tr>
</tbody>
</table>

Source: Primary data processed, 2019

Table 2. Analysis of Environmental Factors on Nurse Discipline at the Makassar City Barombong Health Center

<table>
<thead>
<tr>
<th>Environmental Factor</th>
<th>Discipline</th>
<th>Total</th>
<th>Value p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
<td>Not Good</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>47</td>
<td>0</td>
<td>47</td>
</tr>
<tr>
<td>Not Good</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>447</td>
<td>3</td>
<td>50</td>
</tr>
</tbody>
</table>

Source: Primary data processed, 2019

**Discussion**

The results of the analysis of personality factors on the discipline of nurses in the Makassar City Barombong Health Center after being given a questionnaire showed a significant value of 0.827 > 0.05 which means that H\(_a\) was rejected and H\(_0\) was accepted. This shows that personality factors on discipline have no effect. An important factor in a person's personality is the value system adopted, the value system in this case is directly related to discipline. Values that uphold the discipline taught or instilled by parents, teachers, and communities are used as a frame of reference for the application of discipline in the workplace. The value system will be seen from one's attitude and attitude is expected to be reflected in behavior.

Research conducted shows that there is no meaningful relationship between motivation for working conditions and work discipline. That there is no meaningful relationship between work environment conditions and nurse performance. Other research
that is in line to conclude that there is no significant relationship between developing opportunities and work discipline. Thus it can be concluded that environmental factors have no influence on the discipline of nurses at the Makassar City Barombong Health Center (8, 9).

Efforts to instill discipline are basically instilling values in order to achieve the goals of the Puskesmas from within namely the morale or enthusiasm and awareness of the nurse of the importance of work discipline, discipline because of compliance with existing commitments, and compliance based on identification. The results of the analysis of environmental factors on nurse discipline at the Makassar City Barombong Health Center after being given a questionnaire showed a significant value of 0.827 > 0.05 which means that Ha was rejected and H0 was accepted. This shows that environmental factors on discipline had no effect.

This study is in line with research that analyzes the effect of work environment and work stress on employee performance with the conclusion that the positive influence of work environment with performance is rejected because a significant value of 0.102 is obtained. Results of analysis using chi-square obtained p value = 0.332 or p value > 0.05. Thus, H0 is accepted and Ha is rejected, so it can be concluded that there is no meaningful relationship between work environment and the performance of inpatients at Tugurejo Hospital Semarang (10).

This study is in line with the results that there is no relationship between education, work environment conditions and the quality of nursing services in the Emergency Room Installation of the Salewangan Maros Regional Hospital with p > 0.05, and there is a relationship between workload and the quality of nursing services in the Room of the Nursing Installation. Emergency Regional Hospital of Salewangan Maros with p = 0.003. There is a relationship between factors interpersonal relationships with the quality of nursing services in the Emergency Room Installation of the Salewangan Maros Regional Hospital with p = 0.004. Based on the results of this study it was concluded that the factors of work stress nurses with the quality of nursing services in the Emergency Room Installation of the Salewangan Maros Regional Hospital were workload factors and interpersonal relationships (11).

Contrary to the results of the study that the work environment has a positive but not significant effect on organizational commitment. Work discipline and work stress have a positive and significant effect on organizational commitment the work environment has a positive and significant effect directly on nurse performance without having to go through organizational commitment. Work discipline directly influences but not significantly to nurse performance, but indirectly work discipline has a positive and significant effect on nurse performance through organizational commitment. Thus it can be concluded that personality and environmental factors have no influence on the discipline of nurses in the Makassar City Barombong Health Center (12).

Conclusions

Based on research that has been done, it can be concluded that; there is no influence between personality and environmental factors on the discipline of nurses in the Makassar City Barombong Health Center. The results of this study can be used as a reference material for learning about the discipline of nurses for health workers so that this research input material to carry out their duties properly.

Conflict of Interest: There are no conflicts of interest between the authors.

Source of Funding: Self

Ethical Considerations: The investigator obtained clearance from the Institutional ethics committee before collecting data and has taken informed written consent from each participant. Participant information sheet was also shared which assured privacy and confidentiality of data.

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Inhibition Activity of Lemongrass Extract (*Cymbopogon citratus*) to the Growth of Supragingiva Plaque Bacteria Colony

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Abstract

**Background:** Periodontal disease is multi-factor. It is caused by the interaction of microbes which accumulated into biofilms called plaques and increase the host’s inflammatory immune response. If plaque removal is not adequate, it causes gingivitis, and if it continues then it becomes a chronic infection and leads to attachment loss. The bacteria that colonize inside supragingival plaque can be inhibited with something that contains antibacterial, e.g. lemongrass (*Cymbopogon citratus*). Lemongrass contains many phytochemicals including alkaloids, flavonoids, tannins, and saponins which can be used as antibacterials.

**Objective:** The aim of this study is to determine the inhibitory power of citronella leaf extract against supragingival plaque bacterial activity.

**Method:** This study used extracts diluted with serial dilution method on BHIB media with concentration of 100%; 50%; 25%; 12.5%; 6.25%; 3.125%; 1.56%; 0.78% and bacteria are planted on MHA media. Then, bacterial colony was calculated.

**Results:** There are significant differences in the growth of supragingival plaque bacterial colonies in all concentrations.

**Conclusion:** Lemongrass leaf extract (*Cymbopogon citratus*) inhibits the growth of supragingival plaque bacterial colonies at a concentration ranging from 3,125%

**Keywords:** Supragingival plaque, antibacterial, *Cymbopogon citratus*, periodontitis.

Introduction

Based on 2007 Basic Health Research¹ the prevalence of the Indonesian population with dental and oral problems including periodontal disease was 23.4% and had increased to 25.9% in 2013. Periodontal diseases that are often found are gingivitis and periodontitis.²

Gingivitis is a condition of inflammation of the soft tissue that surrounds the teeth or gingiva. It can cause gingivitis if it is not well-treated and even can develop into periodontitis. Periodontitis is a dental connective tissue disease that causes progressive alveolar bone loss around the teeth and ultimately causes tooth loss.³

Periodontal disease is multi-factor, due to interactions between plaque, microbes, and hosts that encourage an increase in host’s inflammatory immune response.⁴ Dental plaque is a soft deposit in the form of a thin layer (biofilm) that attaches to the surface of the
tooth or other hard structures in the oral cavity. Plaques consist of microorganisms (bacteria) which number almost 70%, microorganisms (non-bacteria) such as microplasma, yeast, protozoa, viruses, leukocytes, macrophages and intracellular matrices.

Supragingival and subgingival plaques associated with teeth play a major role in calculus formation and carries root, whereas subgingival plaques are associated with tissues played a role in tissue destruction. Supragingival and subgingival plaques associated with teeth play a major role in calculus formation and carries root, whereas subgingival plaques are associated with tissues played a role in tissue destruction.

Efforts that can be made to prevent and control the establishment of dental plaques, including managing dietary habit, chemical actions against the bacteria and extracellular polysaccharides also doing a mechanical action in the form of clean up the oral and dental cavities of all the food scraps, bacterial and the metabolisms results.

At present, there are many studies using herbal ingredients as medicines, including in dentistry. One of the plants that can be used as an antimicrobial is lemongrass (Cymbopogon citratus). Lemongrass plants are annual herbaceous plants, originating from the Poaceae Tribe. Those are used as a generator of taste for food and are believed to also be used in traditional medicine. The chemical contents of lemongrass are essential oils, saponins, polyphenols, tannins, and flavonoids.

Based on previous research, it shows that the active compound content of citronella leaves has broad-spectrum antibacterial activity against gram-positive bacteria, gram-negative bacteria, and fungi. Therefore, the ability of lemongrass can be a basic consideration for researchers to make herbal mouthwash ingredients for there are no further studies reporting whether lemongrass leaf extract has the ability to inhibit supragingival plaque bacteria.

The aim of this study was to determine the inhibitory power of citronella leaf extract against supragingival plaque bacterial activity.

**Material and Method**

This type of research is a laboratory experiment with the design of The Post-Test Only control group design. This research was conducted in the Research Center Faculty of Dental Medicine, Airlangga University and Pharmacy Laboratory, Airlangga University, East Java.
After 24 hours, each tube is taken one by one and planted on Mueller Hinton Agar (MHA) media by strike move to check there is bacterial growth or not. Incubation again for 24 hours at 37°C. After the second incubation, we took 0.1 ml from the boundary tube between bacterial growths and the non-positive and negative control then planted on MHA media. After that, it was put into the incubator at 37°C for 24 hours. The number of bacterial colonies that grow on MHA media after the last incubation was calculated and the data analysis was done.

### Results

The results of this study can be seen from the number of supragingival plaque bacterial colonies growth.

**Table 1:** The number of supragingival plaque bacteria colonies given lemongrass extract (*Cymbopogon citratus*) at a concentration of 1.56%-100%

<table>
<thead>
<tr>
<th>Concentrations</th>
<th>Mean Number of Colonies (CF/ml)</th>
<th>Mean Number of Colonies (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>25%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>12.5%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6.25%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3.125%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1.56%</td>
<td>10</td>
<td>6.62</td>
</tr>
<tr>
<td>0.78%</td>
<td>29.3</td>
<td>19.4</td>
</tr>
<tr>
<td>Positive controls</td>
<td>151</td>
<td>100</td>
</tr>
<tr>
<td>Negative controls</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Based on the results of the study, it can be seen that there is no growth of supragingival plaque bacterial in groups of 100%; 50%; 25%; 12.5%, 6.25%, and 3.125%. The growth of supragingival plaque bacterial colonies was only seen at 1.56% concentration and increased the number of bacterial colonies at 0.78%.

**Statistical Analysis:** The measurement results are tabulated according to each group sample, followed by testing the normal distribution using the Shapiro-Wilk Test with Sig > 0.05. It can be concluded that the data are normally distributed, and the homogeneity testing using Levene’s Test with Sig. <0.05 can be concluded that the data is homogeneous. After that, statistical tests were carried out using One-Way Anova at the significance level of Sig. <0.05 and significant differences were obtained. It was continued by performing multiple comparisons using Post-hoc Tukey Anova which concluded that all groups had significant differences.

**Discussion**

Based on phytochemical tests and scientific research, it stated that extracts of lemongrass leaves contain several chemicals. These chemicals include alkaloids, flavonoids, and tannins that have biological activities such as antioxidants, antifungal, and antibacterial so that the extract of lemongrass leaves can inhibit bacterial growth and healing gingival inflammation.

The growth and proliferation of bacteria on media are influenced by various factors and environmental conditions, including temperature, pH, osmotic pressure, oxygen and chemicals present in the media. In this study, all the factors used in the growth, but only the chemicals in the extract of the lemongrass leaf were the
most appropriate in the growth of supragingiva plaque bacterial.

This research shows results in accordance with the research hypothesis that citronella extract (Cymbopogoncitrus) can inhibit the growth of supragingival plaque bacteria. It can be judged from the absence of growth of plaque bacterial colonies in the concentration groups of 100%, 50%, 25%, 12.5%, 6.35%, and 3.125%. However, the bacteria seen at a concentration of 0.78% showed a decrease in the colony from positive control and decreased the number of colonies again at a concentration of 1.56% before finally at a concentration of 3.125% there was no visible bacterial colony.

According to previous research, citronella leaf extract was effective against gram-positive bacteria (Staphylococcus aureus, Bacillus cereus, Bacillus subtilis) compared to gram-negative bacterial bacteria (Escherichia coli, Klebsiella Pneumoniae, Pseudomonas Auruginosa). This is because the active compounds of lemongrass leaves work together to kill pathogenic bacteria.

This research proves that the greater the concentration of citronella extract, the greater the antibacterial activity. This is in accordance with the opinion expressed by Pelczard and Chan (1988) that the higher the concentration of an antibacterial ingredient given, the greater the antibacterial activity.

The flavonoids contained in citronella extract have the most presentation compared to other active compounds, flavonoids can interfere with cell membrane permeability, so the pumping system Na+ and k+ cannot function resulting in retained sodium ions, fluid regulation is inhibited so that the volume in the cell increases and resulting in bacterial death. Saponin has the ability to interfere with surface tension on bacterial cell membranes, which makes the increase in permeability resulting in cell leakage and intracellular compounds will come out, and bacteria die. Alkaloids can cause cell membrane layers not to form intact so that cell leakage occurs and the release of intracellular compounds of bacteria that cause bacterial death. Tanin can reduce the work of endonuclease retention enzymes which results in RNA transcription that does not occur that will disrupt the permeability of bacterial cell membranes resulting in cell leakage and the release of intracellular compounds resulting in bacterial death.

**Conclusion**

Lemongrass leaf extract (Cymbopogoncitrus) effectively inhibited the growth of supragingival plaque bacterial colonies at a concentration ranging from 3.125%.

**Conflict of Interest:** There is no conflict of interest.

**Source of Funding:** This study is self-funded.

**Ethical Clearance:** This study was approved by Ethical Commission of Health Research Faculty of Dental Medicine University of Airlangga.

**References**

7. Nuria MC, Faizatun A. Uji Aktivitas Antibakteri Ekstrak Etanol Daun Jarak Pagar (Jatropha Curcas L) Terhadap Bakteri Staphylococcus aureus ATCC 25923, Escherichia coli ATCC 25922,


Knowledge Regarding COVID-19 Pandemic among Student Nurses: Online Cross-sectional Survey

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1Professor, 2Asso. Prof., 3Asst. Prof. 4Dean, SRM College of Nursing, SRM College of Nursing

Abstract
COVID-19 pandemic it is a public health emergency declared by WHO and it is a major cause of concern for the healthcare profession. The present study is being conducted to assess the knowledge regarding COVID-19 Pandemic among student Nurses. A cross sectional survey by Using Online Google forms study was conducted. Non probability Convenient Sampling technique was used. The tool used for the study comprises of two sections. Section A comprises of demographic data and Section B comprises of structured questionnaire to assess the Knowledge regarding COVID-19 Pandemic among student Nurses which includes 25 questions. The data was collected and analysed by using descriptive and inferential statistics. A structured questionnaire comprised of 25 questions developed by investigators was administered to 213 student Nurses. Among the 213 student Nurses, majority 56.8% of them has adequate knowledge regarding the present global pandemic and 41.8% had moderately adequate knowledge. This study concludes that student Nurses adequate knowledge regarding COVID-19 pandemic.

Keywords: COVID-19 pandemic, Healthcare profession, Student Nurses.

Introduction
Coronaviruses are a large family of viruses that can cause illness ranging from the common cold to more severe diseases like Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The 2019 novel coronavirus, called ‘SARS-CoV-2’ (previously referred to as 2019-nCoV), is a new strain that has not been identified in humans before. The disease that is caused by SARS-CoV-2 is called ‘COVID-19’.

On 31 December 2019, the World Health Organization (WHO) was informed of several cases of viral pneumonia of unknown cause detected in Wuhan City, China.

The outbreak has rapidly evolved, affecting other parts of China and many countries worldwide in Asia, Europe, North and South America, Australia and Africa. On 11 March 2020, WHO labelled the COVID-19 outbreak as a pandemic.

Typical symptoms of COVID-19 include fever, cough, difficulty breathing, muscle pain and tiredness. More serious cases can develop severe pneumonia, acute respiratory distress syndrome, sepsis and septic shock. Anosmia—loss of the sense of smell or sometimes the sense of taste – has also been reported as a symptom of COVID-19 infection.

Generally, older people and those with underlying conditions (such as hypertension, heart disorders, diabetes, liver disorders, and respiratory disease) are expected to be more at risk of developing severe symptoms.

The evidence from analyses of cases to date is that COVID-19 infection causes mild disease (i.e. non-pneumonia or mild pneumonia) in about 80% of cases and most cases recover; 14% have more severe disease and 6% experience critical illness.

COVID-19 is transmitted from human-to-human mainly via flu-like symptoms and respiratory droplets that people sneeze, cough, or exhale. These droplets land on objects and surfaces, and others can catch COVID-19 by touching these objects or surfaces, then touching their eyes, nose or mouth. People can also catch COVID-19
by breathing in droplets from a person with COVID-19 who coughs or exhales droplets.

The infectious period may begin 1–2 days before symptoms appear, but people are likely most infectious during the symptomatic period, even if symptoms are mild. The infectious period is estimated to last for 7–12 days in moderate cases and up to 2 weeks in severe cases.

The first case of COVID-19 in India, which originated from China, was reported on 30 January 2020. As of 15 June 2020, the Ministry of Health and Family Welfare (MoHFW) has confirmed a total of 332,424 cases, 169,798 recoveries (including 1 migration) and 9,520 deaths in the country. India currently has the largest number of confirmed cases in Asia, and has the fourth highest number of confirmed cases in the world with the number of total confirmed cases breaching the 100,000 mark on 19 May and 200,000 on 3 June. India’s case fatality rate is relatively lower at 2.80%, against the global 6.13%, as of 3 June. Six cities account for around half of all reported cases in the country—Mumbai, Delhi, Ahmedabad, Chennai, Pune and Kolkata. As of 24 May 2020, Lakshadweep is the only region which has not reported a case. On June 10, India’s recoveries exceeded active cases for the first time reducing 49% of total infections.

In response to this serious situation, the World Health Organization (WHO) declared it a public health emergency of international concern on January 30 and called for collaborative efforts of all countries to prevent the rapid spread of COVID-19.

Maharashtra and Tamil Nadu, has been seriously hit by the COVID-19 epidemic. Some unprecedented measures have been adopted to control the COVID-19 transmission all over India including the suspension of public transportation, the closing of public spaces, close management of communities, and isolation and care for infected people and suspected cases. Public were advised to just stay at home to avoid contacting with others.

The battle against COVID-19 is still continuing in India. To guarantee the final success, people’s adherence to these control measures are essential, which is largely affected by their knowledge, towards COVID-19 in accordance with KAP theory.

As with SARS and MERS, when dealing with patients who may have COVID-19, health professionals should follow airborne precautions and wear respiratory masks (N95 or higher) during intubation and when entering a negative pressure room. As a Health Care professionals and the Future Nurses are responsible to update the knowledge on COVID 19 pandemic so this study aims to Investigate regarding Knowledge on COVID 19 pandemic among student Nurses at SRM college of Nursing.

Materials and Method

A quantitative approach was utilised to achieve the objectives of this study. Non experimental. Descriptive research design was adopted. Sample size was 213 Student Nurses. Based on the Non probability convenient sampling technique, inclusion and exclusion criteria samples were selected. The study variable was Knowledge on COVID-19 Pandemic.

Participants: This cross-sectional survey was conducted from March to April among Student Nurses the week immediately after the lockdown in India. Because it was not feasible to do a direct structured Interview method during this special period, we decided to collect the data online through Google forms from the Student Nurses as they are the Future Nurses. This Google form contained a brief Introduction on the background, objective, procedures, voluntary nature of participation, declarations of anonymity and confidentiality, and notes for filling in the questionnaire, and agreed to participate in the study were instructed to complete the questionnaire via clicking the link by the student Nurses. After confirmation of the question, the participant was directed to complete the self-report questionnaire. Totally 213 student Nurses responded to the Questionnaire.

Measures: The questionnaire consisted of two parts: demographics and Structured Questionnaire to assess the Knowledge on COVID-19 pandemic. Demographic variables included age, gender, marital status, level of education, Type of Family, Family History of Covid-19, Source of information regarding Covid-19, Dietary Pattern and place of current residence. According to guidelines for the COVID-19 by the World Health Organisation, a knowledge questionnaire was developed by the authors. The questionnaire had 25 questions Overview, clinical presentations, transmission routes, prevention and control of COVID-19. These questions were created as Multiple Choice Question Method, a correct answer was assigned 1 point and an
incorrect/unknown answer was assigned 0 points. The total knowledge score ranged from 0 to 25. The Scoring Interpretation were 0 to 10 (Inadequate Knowledge), 11 to 20 (Moderately Adequate Knowledge), 21 to 30 (adequate Knowledge) The Cronbach’s alpha coefficient of the knowledge questionnaire was 0.75 in our sample, indicating acceptable internal consistency.

**Statistical Analysis:** The information collected from the study participants was scored and tabulated. The data were entered into the master coding sheet and saved in Microsoft Excel. Statistical analysis was conducted using Statistical Package for Social Sciences-16. Mean, percentage, and standard deviation were used to explain the demographic variables, and the Level of Knowledge on COVID 19 Pandemic among Student Nurses and Chi Square test to analyse the Knowledge on COVID 19 Pandemic among Student Nurses with their Demographic Variables.

**Results**

Table 1: Level of Knowledge regarding COVID-19

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Level of knowledge</th>
<th>No. of respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inadequate Knowledge</td>
<td>3</td>
<td>1.4%</td>
</tr>
<tr>
<td>2</td>
<td>Moderately adequate Knowledge</td>
<td>89</td>
<td>41.8%</td>
</tr>
<tr>
<td>3</td>
<td>Adequate Knowledge</td>
<td>121</td>
<td>56.8%</td>
</tr>
</tbody>
</table>

**Discussion**

COVID-19 is a relatively new virus that has had devastating effects within the short time since it was first detected in December 2019. To date, there has been limited published data on knowledge regarding COVID 19 Pandemic. In this study predominantly we found an overall correct rate of 56.8% on the knowledge questionnaire, indicating that most respondents are knowledgeable about COVID-19. The finding of a high correct rate of COVID-19 knowledge among student nurses was unexpected, because this epidemiological survey was conducted during the very early stage of the epidemic. Because of the serious situation of the epidemic and the overwhelming news reports on this public health emergency, the student nurses would actively learn knowledge of this infectious disease from various channels of information. The p values corresponding to the demographic variable “Gender and knowledge level of COVID-19” and “Source of information regarding Covid-19 and Knowledge level of COVID-19”. The significant positive association between social Media and COVID-19 knowledge scores supports this speculation.

Similarly, the p value corresponding to the demographic variable “residential state” is less than 0.05 and is significant at 5% level hence we can say that there is significant association between “residential state and knowledge level of COVID-19”.

All other p values are not significant at 5% level since they are not less than 0.05 hence we can say that there is no significant association between “Age, Marital Status, Level of education, Types of family, Residence, Family History of Covid-19 and Dietary pattern” and “Knowledge level regarding COVID-19”.

The present study was able to provide a comprehensive examination of the knowledge toward COVID-19. The findings suggest that student Nurses have an acceptable level of knowledge on COVID-19 and are generally positive in their outlook on overcoming the pandemic. Even so, consistent messaging from the government and/or health authorities are key to aid their knowledge and understanding of COVID-19. Additionally, to update the Knowledge webinar on COVID 19 pandemic is conducted Continuously to improve the knowledge because the fact that Nurses are at risk of infection in the epidemic chain is a critical issue because Nurses help in controlling the outbreak.

**Acknowledgement:** The author acknowledges Dr. C. Kanniammal Dean, SRM College of Nursing for constant guidance. We would like to thank study participants for their constant support.

**Conflict of Interest:** Dr. Abirami P., Dr Suseelal T., Mrs. Jelin Elizebath G. and Dr. C. Kanniammal declares that no conflict of interest in addition, this study was not funded.

**Statement of Human and Animal Rights:** All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008

**Statement of Informed Consent:** Informed consent was obtained from all the study participants for being included in the study.
References

Salivary Levels of Interleukin-6, Interleukin-8 and Tumor Necrosis Factor-alpha in Smokers Aged 35-46 Years with Dental Caries Disease

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Abstract

Introduction: Dental caries is one of the most common infectious diseases prevalent in the oral cavity, and it is an inflammatory disease with a multi-factor etiology. IL-6, IL-8, and TNF-α are two types of cytokines that are major mediators of acute inflammation, and are necessary for the development of specific immune responses.

Objective: The present study aimed to assess the level of pro-inflammatory cytokines (IL-6, IL-8, and TNF-α) in the saliva of smokers with dental caries and the control (non-smokers) according to different age, BMI, and sex.

Materials and Method: Whole saliva from 32 smokers aged 35-46 years with dental caries and 16 healthy subjects, to measure IL-6, IL-8, and TNF-α levels by enzyme immunoassay (ELISA).

Results: The mean BMI, age, and sex between the experimental group and the control group were similar, were not statistically significant (p=0.466, p=0.240, p=0.455), respectively while, there were a significant difference in CRP between the two groups (p=0.037). Concentrations of salivary IL-6, IL-8 and TNF-α were not affected by periodontal health. No statistically significant difference in periodontal health, assessed by CPITN, were observed between the groups (p=0.413). Salivary levels of IL-6 and IL-8 were significantly higher in smokers with dental caries compared with control (p<0.05). Salivary levels of IL-6 and IL-8 were increased significantly in smokers with dental caries compared with control (p<0.05). No significant differences in salivary TNF-α in dental caries patients compared to control (p=0.063). The correlation between TNF-α, CRP, age, sex, and BMI with IL-8 were positive and statistically significant (p=0.01, p=0.036, p=0.009, p=0.007, and p=0.005), respectively. There was no significant correlation between IL-6 and TNF-α cytokines and other parameters, except for a positive association with CRP levels (p=0.006, p=0.043), respectively.

Conclusions: These data indicate links between production of tumor necrosis factor-alpha (TNF-α), interleukin-6 (IL-6), and Interleukin-8 (IL-8) in smokers’ saliva and dental caries disease. Also, the existence of a statistically significant positive correlation between TNF-α, age, gender, and BMI with IL-8.

Keywords: Dental caries, saliva, inflammation, interleukin-6, interleukin-8, tumour necrosis factor.
phase, and belongs to the pentraxin family. Its levels are elevated in cases of inflammation, injury or infection(3).

Cytokines play a major role in modulating the immune response, and are either proinflammatory (IL-1, IL-8, IL-6, TNF-α and TGF-β), or antiinflammatory (IL-2, IL-4, IL-10, IL-12, and IFN-γ). The nucleus of any cell has the ability to secrete cytokines, but its main source is macrophages and helper T cells(4). Among the cytokines, interleukins have a crucial function and are implicated in oral cancer.

IL-6 is synthesized in acute inflammatory responses that contribute to host defense. It is involved in the processes of controlling the immune response, inflammation, hematopoiesis, and tumorigenesis. Elevated IL-6 levels may lead to disturbances in immune responses. IL-6 is involved in the regulation of tracking of lymphocytes through the lymph node after developmental stimulation(5). Gabayn found that IL-6 contributes to the induction of the transition from acute to chronic inflammation through secretion of the monocyte chemoattractant protein-1 (MCP-1)(6).

IL-8 is an inflammatory stimulant cytokine, and is considered the prototype molecule in the chemokine class. IL-8 also plays an important role in the acute inflammatory response and persists for a relatively long time at the site of inflammation(3). IL-8 release from macrophages and neutrophils is activated by NF-κB. Its expression is modified by other different stimuli, such as hypoxia, inflammation or steroid hormones. IL-8 binds to CRCX-1 and CRCX-2 receptors that are identified on both inflammatory cells from tumor-associated infiltrate and tumor cells(7).

TNF-α is a protein with a role in host defense and in warning responses. It promotes cell proliferation in the white blood cell molecules adhere to endothelial cells and activate phagocytic killing mechanisms. Besides cytostatic and cytotoxic affecting neoplastic cells(8,9), TNF-α involves nuclear factor kappa B (NF-κB), caspase cascades, transcription factors and activating protein-1 (AP-1), and participation in signal regulation, inflammation, cell growth, and death(3). StJohn et al. indicated that IL-8, IL-6, and TNF-α were proven to be overexpressed in OSCC(10). The present study aimed to evaluate the levels of pro-inflammatory cytokines (IL-6, IL-8, and TNF-α) in the saliva of smokers with dental caries aged between 35-46 years and their relationship with BMI, age, sex and their correlation with each other.

Materials and Method

Study Population: Forty-eight subjects aged ranged from 35-46 years, were divided into two groups, the first group included 16 healthy and non-smoking (10 males and 6 females) as controls, while the second group included 32 smokers (18 males and 14 females) with dental caries enrolled at the Clinical Center at the College of Dentistry at Basra University. From January 2019 to September 2019, they were diagnosed under our supervision. Clinical evaluation procedures e.g. examination of teeth, periodontal, oral mucosal status, assessment of malocclusion and collection of saliva samples. The body mass index (BMI) of each individual was calculated in a standard manner. Informed consent was obtained from each participant prior to sample collection.

Salivary Samples Collection: Saliva was collected from patient and controls group by a standard method. After the participants were asked to refrain from eating, chewing and drinking at least one hour before the collection. Saliva samples were collected between 09:00-11:00 AM. Saliva was collected for 10 min in titration tubes by drooling method(11). The saliva samples were homogenized and clarified by centrifugation at 10000 g for 15 min at 4 °C. All samples were stored at -70 °C for analysis.

Detection of Salivary Levels of IL-6, IL-8 and TNF-α: After collecting salivary samples from non-smoking (healthy subjects), and smoking dental caries patients, specific cytokines IL-6, IL-8, TNF-α and C-reactive protein (CRP) were measured by human IL-6, IL-8, TNF-α and CRP ELISA kit (Elabscience, Korea). In order to assess the impact of periodontal disease on levels of salivary cytokines, Community Periodontal Index of Treatment Needs was measured in each patient after the collection of saliva(12). Patients with chronic inflammatory diseases i.e., (psoriasis, arthritis, Sjoegren’s syndrome, inflammatory bowel disease) that may affect levels of salivary cytokines were excluded.

Statistical Analysis: SPSS software 22 was used for statistically analysis. The data are expressed as mean±SD. Significance of the difference between the mean value of the measured parameters between groups were evaluated by Student’s t-test. And chi-square. Correlation was indicated by Pearson correlation tests and P<0.05 is considered significant.
Result

The mean BMI, age, and sex between the experimental group and the control group were similar, were not statistically significant (p=0.466, p=0.240, p=0.455), respectively while, there were a significant difference in CRP between the two groups (p=0.037). Concentrations of salivary IL-6, IL-8 and TNF-α were not affected by periodontal health. No statistically significant difference in periodontal health, assessed by CPITN, were observed between the groups (p=0.413)[Table 1]. Salivary levels of IL-6 and IL-8 were significantly higher in smokers with dental caries compared with control (p<0.05). No significant differences in salivary TNF-α in dental caries patients compared to control (p=0.063)[Table 2]. The correlation between TNF-α, CRP, age, sex, and BMI with IL-8 were positive and statistically significant (p=0.01, p=0.036, p=0.009, p=0.007, and p=0.005), respectively. There was no significant correlation between IL-6 and TNF-α cytokines and other parameters, except for a positive association with CRP levels (p=0.006, p=0.043), respectively [Tab 3].

Table 1. Comparison between dental caries patients and controls according to BMI, age, sex, CRP, and CPITN.

<table>
<thead>
<tr>
<th>p-Value</th>
<th>Control (Mean ± SD)</th>
<th>Dental Caries cases (Mean ± SD)</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.466</td>
<td>23.14±5.22</td>
<td>22.33±8.02</td>
<td>BMI (kg/m²)</td>
</tr>
<tr>
<td>0.240</td>
<td>41.76±3.41</td>
<td>46.78±4.36</td>
<td>Age (years)</td>
</tr>
<tr>
<td>0.455</td>
<td>29.17±5.88</td>
<td>28.34±7.06</td>
<td>Sex</td>
</tr>
<tr>
<td>0.037*</td>
<td>3.14±2.16</td>
<td>9.87±2.55</td>
<td>CRP (mg/L)</td>
</tr>
<tr>
<td>0.413</td>
<td>2.18±1.05</td>
<td>2.33±1.12</td>
<td>CPITN</td>
</tr>
</tbody>
</table>

CPITN: Community Periodontal Index of Treatment Needs * p< 0.05: Differences between patients with dental caries and healthy group.

Table 2. Salivary interleukin 6, interleukin 8, and tumor necrosis factor alpha in patients with dental caries and controls.

<table>
<thead>
<tr>
<th>p-Value</th>
<th>Control(n=16) (Mean ± SD)</th>
<th>Dental Caries Cases(n=32) (Mean ± SD)</th>
<th>Cytokines</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.005*</td>
<td>2.58±5.56</td>
<td>43.88±28.76</td>
<td>IL-6 (pg/mL)</td>
</tr>
<tr>
<td>0.008*</td>
<td>616.15±309.33</td>
<td>1597±957.22</td>
<td>IL-8 (pg/mL)</td>
</tr>
<tr>
<td>0.063</td>
<td>8.20±5.85</td>
<td>8.54±5.88</td>
<td>TNF-α (pg/mL)</td>
</tr>
</tbody>
</table>

* p< 0.05: Differences between patients with dental caries and healthy group.

Table 3. Correlation between proinflammatory cytokines and C-reactive protein, BMI, age and sex in dental caries patients.

<table>
<thead>
<tr>
<th>BMI</th>
<th>Sex</th>
<th>Age</th>
<th>CRP</th>
<th>TNF-α</th>
<th>IL-8</th>
<th>IL-6</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.091</td>
<td>0.122</td>
<td>0.083</td>
<td>0.006*</td>
<td>0.332</td>
<td>0.877</td>
<td>-</td>
<td>IL-6</td>
</tr>
<tr>
<td>0.005*</td>
<td>0.007*</td>
<td>0.009*</td>
<td>0.036*</td>
<td>0.01*</td>
<td>-</td>
<td>0.877</td>
<td>IL-8</td>
</tr>
<tr>
<td>0.410</td>
<td>0.344</td>
<td>0.225</td>
<td>0.043*</td>
<td>-</td>
<td>0.01*</td>
<td>0.332</td>
<td>TNF-α</td>
</tr>
</tbody>
</table>

* p< 0.05: Differences between smokers with dental caries and healthy group.

Discussion

Cytokines regulate many aspects of the immune response, therefore, along with other factors, they will be useful tools for diagnosing and monitoring the oral cavity, and saliva can be used as diagnostic material to measure biomarkers released during disease onset and progression. IL-6, IL-8, and TNF-α immune cell products play an important role in oral mucosa diseases, but the exact role of cytokines in the etiology of dental caries is not well known. In the innate response, the
molecular phenotypes associated with oral pathogens bind to the receptors of the host cells, including dendritic cells, which then activate the inflammatory response by releasing the active of pro-inflammatory cytokines, i.e., IL-1β, IL-6, IL-8 and TNF-α(3). Initially, gingivitis may only develop, and if the immune response is successful, periodontitis will resolve; however, if the infection persists and more bacteria spread occurs, intensification of the warning response can damage gum tissue in infected subjects(13). The mean BMI, age, and sex between the experimental group and the control group were similar, not were statistically significant (p=0.466, p=0.240, p=0.455), respectively. While, there was a significant difference in CRP between the two groups (p<0.037). Concentrations of salivary IL-6, IL-8 and TNF-α were not affected by periodontal health. No statistically significant difference in periodontal health, assessed by CPITN, were observed between the groups (p=0.413) [Table 1]. These results are consistent with other studies(1, 14). One study indicated that elevated CRP levels were a risk factor for developing one type of cancer. High levels of CRP before surgery are an unwanted diagnostic indicator(15). Yadav and Prakash indicated that the pattern of dental caries varies with BMI, sex, age, race, food habits, socio economic status, geographical location and oral hygiene practices(16). There is a correlation between CRP levels and disease prognosis. In the study by Park et al., an increased CRP/albumin ratio was correlated with prolonged disease and decreased survival rate(17). Blatt et al. noted that CRP, ferritin, and hemoglobin can be used as biomarkers in diagnosis and disease progression(18). The same idea is supported by Tai et al. in patients with oral squamous cell carcinoma (OSCC), which they showed a positive association between high CRP levels and oral cancer, and revealed that CRP level was associated with invasion of localized lymph nodes(19). Relationship between cancer and inflammation is bidirectional. The tumor triggers an inflammatory response by increasing serum levels of CRP on the one hand, and chronic inflammation is involved in the development of a malignant process, on the other hand(3). On the other hand, Grimm et al. identified high levels of CRP, high number of total leukocytes, neutrophils, monocytes; and a low number of lymphocytes is correlate with a low survival rate in oral cancer(20). Salivary levels of IL-6 and IL-8 were significantly higher in smokers with dental caries compared with control (p<0.05) [Table 2]. The levels of salivary cytokines are elevated as a result of disturbances in the oral cavity, and these results are in line with previous studies(13, 14). Also, these results were confirmed by the Kurtis et al. where they found that high levels of IL-6 in dental caries patients lead to fewer broblasts and osteoblasts. It also supports demineralization of teeth and the development of cavities, especially in smokers(21). IL-8 play an important role in the acute inflammatory response and persists for a relatively long time at the site of inflammation(3). Garrido et al. showed significantly higher levels of CRP and IL-6 in subjects diagnosed with apical periodontitis compared to normal healthy teeth(22). Tumor can trigger an inflammatory response, triggering the release the cytokines i.e., IL-1β and IL-6. Márton et al. indicated that the specificity and sensitivity of IL-6 protein were less favorable than IL-6 mRNA, and the expression of salivary IL-6 mRNA was significantly associated with dental status and age(23). On the other hand, Gabay reported that interleukin-6, in addition to the presence of other cofactors, causes resorption of bones and stimulates synthesis of chemocines(6). Saheb Jamee et al. found significantly higher concentrations of IL-6 in patients with OSCC and in the saliva of chronic periodontitis compared to IL-8 and TNF-α levels(24). Gornowicz et al. reported significantly elevated salivary IL-6 levels in children with dental caries. Consequently, the researchers speculated that the dysfunction of the triangle oral mucosa, immune cells and saliva lead to the emergence of oral mucosa diseases i.e., periodontitis, leukoplakia, oral lichen planus and oral cancer(1). Our results differ from the Teles et al., on the one hand, as they reported lower levels of IL-8 and elevated levels of TNF-α(25). On the other hand, it is compatible, as they reported elevated levels of IL-6 in a healthy periodontally group compared with chronic periodontitis. IL-6 receptor stimulates the activation of signal transducers, Janus kinases (JAK), and activators of transcription (STATs), which then stimulate pathways that include mitogen-activated protein kinase (MAPK), which in turn supports cancer development. This may explain the reasons for the elevated levels of IL-6 in the saliva of smokers with dental caries and OSCC patients. Manifestations of IL-6 have been detected in tumor cells and tumor-infiltrating leukocytes, and this indicates the presence of a paracrine loop of stimulation. Colak et al., show that children who are frequently exposed to sugary fluids, formula milk, breast milk, fruit juices, etc. from sweet liquids for long periods are at risk of early childhood caries (ECC)(26). Consequently, Menon et al. concluded that the problems that children face especially ECC are not just pain and infection, but they also affect communication, speech,
eating, dietary nutrition, playing, etc\(^{27}\). No significant differences in salivary TNF-\(\alpha\) in dental caries patients compared to control \((p=0.063)\) [Table 2]. These results are consistent with other studies \((7, 28)\). Contrary to our findings, Kurtis et al. found that high levels of TNF-\(\alpha\) in the saliva of dental caries patients lead to fewer fibroblasts and osteoblasts, and aid in demineralization of teeth and the development or deepening of cavities, especially in smokers\(^{21}\). One study showed that TNF-\(\alpha\), which is produced by osteoclasts, is an important factor that regulates the spacing of these cells as well as is involved in the processes of resorption\(^{29}\). Ghallab et al., found a lower elevation of TNF-\(\alpha\) in erosive oral lichen planus (OLP) patients after treatment\(^{30}\). Mcleachlan et al., conclude that pro-inflammatory cytokine concentrations are also elevated within both gingival tissues and serum of persons with periodontal inflammation\(^{31}\). The DEATH protein bound to TNF-\(\alpha\) is encoded by the TRADD gene, which recruits TNF-\(\alpha\) receptor-associated factor-2, a protein is encoded by the TRAF2 gene and signaling molecule RIP which activates and stimulates the Nuclear Factor Kappa-light-chainenhancer of activated B cells (NF-\(\kappa\)B) pathway, and is involved in cell survival and proliferation and anti-apoptotic agents, and this explains why TNF-\(\alpha\) levels did not change in patients’ saliva. The correlation between TNF-\(\alpha\), CRP, age, sex, and BMI with IL-8 were positive and statistically significant \((p=0.01, p=0.036, p=0.009, p=0.007, and p=0.005)\), respectively [Tab 3]. These results have been confirmed by other studies\(^{1, 13}\). IL-8 is released by neutrophils and macrophages in response to various stimuli i.e., steroids, inflammatory signals, chemical environment, and environmental stresses that activate the nuclear factor-kappa-B(NF-\(\kappa\)B) pathway that activates the expression production of IL-8. IL-8 and TNF-\(\alpha\) play an important role in immunity of the oral cavity. It is possible that elevated levels of IL-8 lead to stimulation of TNF-\(\alpha\). These results have been supported by previous studies \(^{1, 13}\). IL-8 levels may change with lifestyle, ethnic differences, geographic distribution, genetic differences, and individual habits. Elevated IL-8 levels may be found in gingivitis and periodontitis. However, none of these cases can raise the levels to the extent seen in oral cancer\(^{7, 32}\). Punyani and Sathawane found that increased levels of IL-8 confirmed its role in angiogenesis and progression\(^{32}\). Therefore, large changes in IL-8 levels provide us with great potential for use as a single salivary biomarker. This could open new horizons for treatment plans from targeted leukotriene therapy\(^{31}\).

There were no significant correlation between IL-6 and TNF-\(\alpha\) cytokines and other parameters, except for a positive association with CRP levels \((p=0.006, p=0.043)\), respectively [Tab 3]. This conclusion was confirmed by a previous report\(^{39}\). Sugawara indicated that TNF-\(\alpha\) is an effective cellular compound and its production leads to oral diseases\(^{32}\). This means that the salivary level of cytokines may be increased as a result of disorders in the oral cavity. These results are consistent with other studies\(^{7, 33}\). Barnes et al., reported that IL-6 can be generated not only by activated macrophages/monocytes, but also by fibroblasts and activated endothelial cells in inflamed tissue, while TNF-\(\alpha\) is produced predominantly by activated macrophages at the site of infection/inflammation, and also by T cells. In turn, IL-6 production can lead to the inhibition of TNF-\(\alpha\) expression\(^{36}\). This finding supports our current results. On the other hand, Li et al. indicated that up-regulation of MUC1 expression in oral epithelial cells result from Porphyromonas gingivalis infection or increases in pro-inflammatory cytokines such as IL-1\(\beta\), IL-6, and TNF-\(\alpha\)\(^{37}\). Contrary to our results, Fine et al., reported that IL-6 can be generated not only by activated macrophages/monocytes, but also by fibroblasts and activated endothelial cells in inflamed tissue, while TNF-\(\alpha\) is known to be produced predominantly by activated macrophages at the site of infection/inflammation, and also by T cells\(^{36}\). Several studies have indicated the pivotal role of chronic inflammation in carcinogenesis by modifying inflammatory cells and cytokine production\(^{3, 37}\). This explains why cytokine levels are high in patients, and thus support our current findings. Also, the result of this study confirmed by Barnes et al., who stated that IL-6 can be generated not only by activated macrophages/monocytes, but also by fibroblasts and activated endothelial cells in inflamed tissue, while TNF-\(\alpha\) is known to be produced predominantly by activated macrophages at the site of infection/inflammation, and also by T cells\(^{36}\). In turn, IL-6 production can lead to the inhibition of TNF-\(\alpha\) expression\(^{39}\). Saheb Jamee et al. found significantly higher concentrations of IL-6 in patients with OSCC and in the saliva of chronic periodontitis compared to cytokine levels (IL-6, 8, and TNF-\(\alpha\))\(^{24}\). Data from this study indicate links between the production of inflammatory, and immunoregulatory cytokines and chemokines (IL-6, IL-8 and TNF-\(\alpha\)), and dental caries in smokers. Therefore these parameters can be used as biomarkers to indicate disease severity and progression.

**Conclusions**

The results indicate links between production of IL-6 and IL-8 in smokers’ saliva and dental caries.
Excretion of specific cytokines in patients’ saliva are useful tools for diagnosing and monitoring dental caries disease. Therefore, can be used saliva as a noninvasive diagnostic fluid to measure biomarkers released during disease onset and progression.

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Pandemic Corona Virus and Policy of Forest Resources Conservation

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Abstract

These brief highlights some of the identified and perceived impacts of the COVID-19 crisis on development aspects interconnected with the forest sector, with a particular emphasis on the impacts on the production and trade of forest workers. It proposes a series of recommendations as a basis for policy development in the aftermath of the crisis, and highlights potential opportunities to leverage the progress achieved so far, to ensure that decades of advances are not reversed. Forest products, including non-wood forest products continue to support livelihoods throughout the crisis while delivering essential items, such as hygiene and sanitary products, biomass for heating, ethanol forsanitizer, respirator paper and packaging for parcels. Forest preservation is currently a concern of many countries, including Indonesia, Basic policies are needed so that the problem of forest destruction can be overcome. Furthermore, in order to achieve the objectives of forestry policy, there are several conditions after pandemic Covid 19 outbreaks, one of which is that there must be an active involvement in conserving forest resources.

Keywords: Policy, forest preservation, Covid 19, pandemic.

Introduction

Pandemics are hazards related to large-scale outbreaks of infectious diseases that can greatly increase morbidity and mortality over a wide geographic area and cause significant economic, social, and political disruption. The consequences of a pandemic, affecting people on a worldwide scale, with expected long-term impacts and consequences on the coupled socio-ecological systems, can be described as a disaster. On 13 March 2020, the World Health Organization (WHO) declared the novel coronavirus disease (COVID-19) a pandemic pushing humankind into an ongoing global crisis, which is unique in the recent history, at least by its spatial extent, rapid onset and its complexity of consequences.¹

Based on observations conducted by the researcher, in the conservation area of natural resources in Wonogiri, located in Gendol hill forest nature reserve in Dali Village, Geneng Village and Conto Village, Bulukerto Sub-District, Wonogiri Regency, which is located exactly at the foothill, there are 650 families in these villages that are very dependent on the existence of clean water from the Gendol Hill river, as said by Sadiman in a conversation (December 2017). In other areas, approximately 20 km to the south-west side, there is Donoloyo teak forest, Watusumo Village, Slogohimo Sub-District, Wonogiri Regency, which covers 8300 m² area. According to the provision, that area must be preserved and maintained in harmony and balance, taking into account the preservation of the ecosystem, said Totok a Forest Ranger, Person in Charge of BKSDA Wonogiri (May 2017).

Ministerial Regulation of Environment and Forestry of the Republic of Indonesia Number P.6/Menhk/ Setjen/ot 1.0/1/2016 concerning Organization and Work Procedure of Forest Area Stabilization Center
and Law No. 5 of 1990 concerning Conservation of Biological Natural Resources and their Ecosystems are the provisions that provide a basis for ideas in general which has to be adjusted with the actual condition, said Hidayat, W (May 2018), Secretary of the Wonogiri Environmental Office.

Sadiman said that “if I have helped the community including the government, does the government intend to pay attention to my wishes?” Sadiman himself wants the area to become a tourism area that will later be monitored and maintained. This also includes sedimentation condition that occurs in Gajah Mungkur Wonogiri Reservoir and not-maintained Donoloyo teak forest, Watusumo Village, Slogohimo Sub-District, Wonogiri Regency, which until now require attention from the government, especially concrete maintenance follow-up plans, which of course must be preceded by development-oriented policies, which are mainly based on local wisdom, as stated by Bintoro, T, an activist and an observer of forestry (October 2019).

Besides that, the researcher tried to meet with policy makers who in this case were responsible informants namely Mr. Edi Santoso (Deputy Regent of Wonogiri) said that there are 2 forms of conservation policy currently running after the pandemic in Wonogiri namely forests within the area and forests outside the area. If we talk about forests in the area I can say one hundred percent has nothing to do with the Wonogiri Regency government policy, because the management of conservation issues, and production management, etc. are all the authority or authority of Perhutani. For those outside the area or community forest (forest on community-owned land) the Wonogiri Regency government has the authority to determine policies. Teak Forest Donoloyo including Alas Gendol is fully the authority of Perhutani (forest within the area). The regional government of Wonogiri Regency in accordance with the regional autonomy law number 23 of 2014 in its policy does not include forests in the area which means that even though its geographical location is still within the Wonogiri regency area, the regional government of Wonogiri Regency is not entitled to forest policies in the area.

Based on the aforementioned description, the Policy of Forest Resources Conservation after the Covid 19 outbreak needs to be reviewed in order to comprehensively understand the overview of conservation towards forest resources in Wonogiri Regency area.

Method

This research uses normative and empirical research method. As a result, the observations conducted are in accordance with the required needs.

Results and Discussion

a. Definition of Policy: The term policy as referred herein is equated with the word policy which is distinguished from policy (wisdom) and policy (virtue). Winarno and Wahab agree that the term ‘policy’ is often used interchangeably with other terms such as goals, programs and grand design. For policymakers and people engaged in the field of policy, the use of these terms may be confusing.

Basically, there are many restrictions or definitions regarding the meaning of policy. Each of these definitions gives different emphasis. This difference arises because every expert has different backgrounds.

A writer said that policy is the principle or way of acting chosen to direct decision making. According to Ealau and Kenneth Prewitt quoted by Charles O. Jones, policy is a standing decision characterized by behavioral consistency and repetitiveness on the part of both those who make it and those who abide it. The United Nations (UN) states that a definition of policy is a guide for action. This guideline can be very simple or complex, general or specific, broad or narrow, vague or clear, loose or detailed, qualitative or quantitative, public or private. Policy with this definition may be in the form of a declaration about a program, regarding certain activities or plans.

Based on the discussion above, we intend to formulate a definition of public policy as a response to a political system, through government power, towards the problems of society. In other words, public policy is the government’s decision to solve public problems. Such decision can implied actions or not actions, the word “public” can mean both community and company, it can also mean the state-political system and administration. Meanwhile, “government” is a person or group of people who are mandated by all members of a political system to make arrangements for the entire system. It can be RT, RW, village, regency, province, State, between countries (ASEAN, EU) and the world (WTO, UN).
b. **Power manifestation of community influence in its care for forest conservation and resources:**

In the first research, based on observations and involved directly into the field conducted by the writer by using the methodology of sociological approach about the forestry conservation after pandemic Covid 19 outbreak, the overview of resources conservation that have been carried out apparently is not as expected.

The second research was located in Donoloyo teak forest, Watusumo Village, Slogohimo Sub-District, Wonogiri Regency, which covers an area of 8300 m². According to the provision, that area must be preserved and maintained in harmony and balance, taking into account the sustainability of the ecosystem. The forest is historically a forest that is located on the banks of the upper reaches of Bengawan Solo.

The covid 19 outbreak benefits the conservation and natural resources agency (*Balai Konservasi dan Sumber Daya Alam*, BKSDA) and until now, the forest has been preserved since people will not dare to take the slightest element related to the teak trees because of the pandemic. From the description above, it turns out that the forest ranger as well as the head of BKSDA can take advantage of this situation so that the forest rangers can internally make a policy that can be used in the context of awareness to the surrounding community for the maintenance of the Conservation and Natural Resources Agency (BKSDA).

c. **Bottom up policy model before the pandemic outbreak:** Policy implementation is an activity that can be seen after the issuance of valid direction from a policy that includes efforts to manage inputs in order to produce outputs or outcomes for the community. The stage of policy implementation can be characterized and distinguished from the policy making stage. Policy making on one hand is a process that has a bottom-up logic, in the sense that the policy process begins with the delivery of aspirations, requests or support from the society. On the other hand, policy implementation has a top-down logic, in the sense of decreasing abstract or macro alternatives policy into concrete or micro actions. Grindle stated that implementation is a general process of administrative action that can be examined at a particular program level. Meanwhile, Van Meter and Van Horn stated that policy implementation is an action carried out by the government and private sector both individually and in groups with the intention of achieving purposes. Grindle added that the implementation process will only being when concrete goals and objectives have been determined, an activity program has been arranged and funds are ready and submitted in order to achieve the goals.

d. **Typology of policy resolution:** In this research, the writer must obtain the overview of the conservation of forest resources in the Wonogiri Regency area in accordance with the researched object. It is done in order to obtain a typology of each researched area, as the resolution of problems arising from each of researched area is not the same. Based on the aforementioned matter, in accordance with the arising problems, the forestry policies should change for the better. The policy enforcers should consider giving incentives to the affected people.

The work of the forest apparatus is lighter because the forest looting perpetrators are scared of the pandemic, thus the condition of the forest is more maintained. The policy makers should apply the health protocol in making policies. Complete a workplace risk assessment including, creating a day-to-day plan that follows the guidelines Develop a COVID-19 Infection Prevention and Control Protocol (Protocol) based on the risk assessment on the forestry policy. Implement and enforce the Protocol to help prevent and control the transmission of COVID-19. Reducing the number of social interactions between state apparatus in the forestry and people and nearby communities. Physical distancing or enhancing protection via masks where physical distancing is not practical Good hygiene practices on forest inspection. Cleaning and disinfecting high touch point areas at the start and end of each day

From the aforementioned events, the Forest Ranger and the head of BKSDA, Totok, can take advantage of the occurring situation and condition so that the story can be used as materials for awareness to the community for the preservation of BKSDA during pandemic, this kind of policy model must be heard and considered by related officials from the local to the center in order to be used as a reference material in the framework of determined policy during pandemic.
Therefore, if we compare the costs incurred with the benefits in the sense there is neither profit nor loss from it. However, if the reservoir is functioned as its original function, then the cost is very high and it seems impossible to be conducted seeing our current economic condition. Also, with regards to green belts planted, apparently it was not carried out in accordance with the protocols during pandemic. This matter must be heard by the concerned officials from the local to the center to be used as materials in determining actions in making policy.

From the problem that arises as the research object, which is regarding the matter of policy decided by the government, in this case the Ministry of Environment, it is still not aspirational. This can be proven by the case of Forest Conservation both in terms of its management or the rights and obligations of each party between the community and the government as occurred in several places.

**Conclusion**

Firstly, we must optimize the pandemic gave a security sense in the forest. BKSDA need to give autonomy in addressing environmental issues that are related to policies that favor the community during pandemic by using the potential strengths of local communities and combining them with the strength of interest groups in the community in order to carry out communication to provide data that is true and can be accounted for in order for it to be used as consideration by relevant officials in making policies related to forest resources. Secondly, by using the health protocols during implementation of the policy in the field that occurs and a human relation approach that is combined with the sociological process occurring in public life, by way of emphasizing the formal and logical approach, so that it tends be creative and rejects the routine logic regulations, this is where the enlightenment policy lies on safety of the people and the forest.

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**Source of Funding:** Author

**Ethical Clearance:** Yes, From Universitas Muhammadiyah Ponorogo

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Redefining Dental Practice During and Post-COVID-19 era: A Review

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Abstract

The spread of the COVID-19 pandemic has led to widespread concerns internationally and among the members of the public health community including dental health professionals. The dental health care professionals are at higher than usual risk due to the proximity to the patient’s face, direct contact with the body fluids such as saliva and blood. The objective of this article is to provide an overview of the symptoms, modes of transmission of the COVID-19 infection, triaging of the dental patients, specific recommendations for the management of the dental patient, infection control modalities with an emphasis on dental specialties, global outlook on the pandemic by dentists, and implications on the patients and dentists. A literature search was performed and articles about the symptoms and modes of transmission of the COVID-19 infection, management of COVID-19 diffusion in dental practice were retrieved. The articles were then reviewed and infection control measures for various dental specialties as well as patient management strategies were also outlined in the results. The dental team has to implement measures to provide care and treatment to the patient as well as prevent the spread of the infection.

Keywords: COVID-19, Dental Practice, Cross Infections, Patient Management, Risk stratification, Dental Triaging.

Introduction

The prevailing COVID-19 pandemic in the world is caused by a virus named SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2). SARS-CoV-2 belongs to a large family of viruses called the Coronaviruses (CoVs).[1] The China health authority informed the World Health Organization of multiple cases of pneumonia of unknown etiology in the Wuhan province on December 31st, 2019. Most of the patients lived or worked around the Huanan local seafood wholesale market.[2] On January 7th, 2020, the WHO abbreviated the new pathogen discovered from the throat swab of one of the patients as 2019-nCoV.[3] The Coronavirus Study Group renamed the pathogen as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). There was no evidence of human to human transmission in the first two weeks of detection of the disease, and it was considered to be a normal flu consisting of acute respiratory problems with a common cold. A severe outbreak of the virus happened in China.

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in the third week of January 2020, followed by spread throughout the globe\[4\]. As on September 3, 2020, the total number of laboratory-confirmed cases in the world are 26,182,709, of which 18,446,689 have recovered, and the number of deaths is 867,362.\[5\] An extensive search was carried out on COVID-19 and dental health professions on the internet to obtain literature. Gaps and areas of wealth in the literature were identified.

**Symptoms of Covid-19:** A patient infected with COVID-19 may present with mild, moderate, or severe illness. Patients suffering from mild illness present with upper respiratory tract infection, mild fever, dry cough, sore throat, nasal congestion, headache, muscle pain, or malaise. Ageusia or loss of taste and/or anosmia or loss of smell, diarrhea, and vomiting have also been observed. Cough and shortness of breath without signs of severe pneumonia are seen during the phase of the moderate illness. Fever with severe dyspnoea, respiratory distress, tachypnoea (> 30 breaths/min), and hypoxia (SpO$_2$ < 90% on room air) is seen in severe illness. Children present with mild cyanosis, too.\[6\]

**Modes of spread and risk associated with COVID-19 in dental clinics:** COVID-19 can be transmitted from one person to another directly through respiratory droplets, with recent studies suggesting that transmission may occur via contact and could be fomite borne.\[7\],\[8\] The asymptomatic incubation period for infected individuals has been reported to be approximately 1 -14 days, but asymptomatic individuals could spread the virus after 24 days.\[9\],\[10\],\[11\] The presence of the live virus in the saliva of the infected was demonstrated by To et al.\[7\] The virus binds to the human ACE -2 (angiotensin-converting enzyme 2) receptors, which are present in high concentrations in the salivary glands.\[12\],\[13\]

The dental care setting carries an increased risk of transmitting infection due to the procedures carried out that involve close facial communication with the patient, multiple, often long exposure to body fluids such as blood, saliva, sweat, etc. as well as sharp instruments and armamentarium. Transmission of the virus may be due to direct inhalation of microbe, which is airborne and could remain suspended for long duration in the air; due to direct contact with patient materials, contact with the conjunctival, nasal, or oral mucosa with droplets and aerosols containing the virus. Cough from an infected individual may propel the virus a short distance in the form of droplets.\[15\],\[16\] Contact with contaminated instruments and surfaces can also lead to the spread of the infection.\[17\]

However, among the modes mentioned above, droplet and aerosol transmission of the virus are of utmost concern in the dental clinic as it is tough to avoid generating a massive quantity of aerosol as well as droplet containing the patient’s saliva and blood during dental practice. The dental instruments such as hand pieces use gas to drive the turbine to rotate at high speeds and work with running water and generate aerosols and droplets mixed with the patient’s saliva and blood which could stay airborne for a while and further settle on surfaces or enter the respiratory tract.\[15\] Besides, dental professionals and other patients have likely contact of conjunctival, nasal, or oral mucosa with droplets and aerosols containing microorganisms generated from an infected individual and propelled a short distance by coughing and talking without a mask. Effective infection control strategies are needed to prevent the spread of 2019-nCoV through these contact routines.\[18\],\[19\].

Cough or sneeze by an infected person can render the virus and infect individuals within a radius of approximately 2 meters, thus forming the basis for the social distancing measures among the community to decrease the spread.

Inanimate objects located close to an infected individual or touched by him/her could be a source of spread.\[20\],\[21\]. Handwashing and disinfection play a key role in stopping the spread of this disease.\[22\].

**Tele dentistry and messaging services during the COVID-19 pandemic:**

- Tele dentistry can be a practical approach during the COVID-19 pandemic to decrease the number of patients visiting the dental clinic and thus limiting the visits to emergency and urgent dental care.
- WhatsApp Messenger, owned by Facebook Inc., California, is a text messaging service that can be used for communication between the dentist and the patient. Members of the dental health team should be appropriately taught to use these internet-based communication tools with an assessment of indications and contra indications. Virtual assistance in the form of photographs, short video clips, or video calls can be of great use for communication between the patient and dentist to evaluate the need of the patient to visit the dental clinic.\[23\],\[24\],\[25\].
**Triaging of Dental Patients:** The patients visiting the dental clinic can be segregated based on the criteria mentioned in Table 1.

**Table 1: Criteria for segregating the dental patients in dental clinic**

<table>
<thead>
<tr>
<th>Priority</th>
<th>Procedures</th>
<th>Management</th>
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<tbody>
<tr>
<td>Emergency</td>
<td>• Deep head and neck infections with airway obstruction</td>
<td>Appropriate treatment to be provided</td>
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<td></td>
<td>• Malignant tumors which involve reconstructive procedures</td>
<td></td>
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<tr>
<td></td>
<td>• Open Fractures</td>
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<tr>
<td></td>
<td>• Periapical abscess/abscess with swelling that might lead to space infections</td>
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<tr>
<td></td>
<td>• Severe hemorrhage/bleeding</td>
<td></td>
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<tr>
<td></td>
<td>• Swelling due to preactivated orthodontic appliance</td>
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<tr>
<td>Priority</td>
<td>• Tempromandibular joint pathology causing pain</td>
<td>Conservative management depending on the condition until COVID-19 situation improves.</td>
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<tr>
<td></td>
<td>• Benign slow-growing tumors and cysts</td>
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<td>• Cleft lip and palate surgery</td>
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<td></td>
<td>• Closed fractures</td>
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<tr>
<td></td>
<td>• Root canal treatment/Pulpectomy/Pulpotomy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Extraction of third molar/any other tooth with no periapical infection</td>
<td></td>
</tr>
<tr>
<td>Postpone (until the COVID-19 pandemic has settled)</td>
<td>• Orthognathic surgery</td>
<td>Deferred until the COVID-19 situation is entirely under control</td>
</tr>
<tr>
<td></td>
<td>• Cosmetic procedures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Orthodontic treatment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Restorations(caries not very deep)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Scaling and root planning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Crown and bridge procedures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Abscess</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ill-fitting prosthesis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Dental implant</td>
<td></td>
</tr>
</tbody>
</table>

**Management of a patient with symptoms of COVID-19:** If a patient has symptoms of COVID-19, then the patient needs to be categorized as a high-risk patient and may be managed as stated in figure 1.
There is no standard protocol for the various specialties of dentistry as well as general dentistry on the approach to management of a patient during and post the Covid-19 pandemic. This discussion lays down the guidelines for the management of a dental patient with prevention of nosocomial infection as well as guidelines of individual dental specialities.

a. Management of a dental patient and prevention of hospital-acquired/nosocomial infection

- Elective procedures to be deferred and only urgent/emergency procedures to be performed
- Standard, contact, and airborne precautions to be followed by the dentists, which include the use of personal protective equipment (PPE) as well as following hand hygiene practices\[26\]
- Use of mouth rinse before the procedure: SARS-CoVIs known to highly susceptible to topovidone mouth rinse.\[27\] Rinsing can be advised before the procedure, and 0.2% povidone-iodine may be used. This could help in the reduction of the virus in the saliva.\[28\],\[29\]
- Some of the dental instruments used in the clinic, such as mouth mirrors and syringes, should be disposable or single-use, which prevents prevent cross-infection.
- Extraoral radiographs \{OPG & CBCT (Cone beamcomputed tomography)\} should be recommended to avoid gagging or initiation of the cough reflex, which is frequent during intraoral imaging. If an IOPA or any other intraoral imaging procedure is mandatory, then the sensorsshould be double barriered.\[30\]
- Rubber dam minimizes splatter generation.
- The use of ultrasonic armamentarium, as well as high-speedhandpieces and 3-way syringes, should be reduced to decrease the generation of contaminated aerosols.
- Negative-pressure treatment rooms or \(ff2\) and well ventilated operating rooms (AIIRs) to be used to treat a suspected laboratory confirmed COVID-19 positive patient rather than in a routine dental clinic setting.\[31\]
- Disinfection of the inanimate surfaces with chemicals as the SARS CoV-2 virus could survive and stay viable in aerosols for 2 to 3 days at room temperature on inanimate objects or surfaces.\[31\]

b. Patient management by certain individual dental specialties

Oral and maxillofacial surgery:

Outpatient:

- Minimum patients to be entertained as no elective surgery to be performed
- Consultation on the phone/video call to be held before face to face meeting with documentation of the telehealth procedures
- Minimum number of patients to be present in the waiting room; contact time to be shortened
- Risk assessment of the patient to assess the possibility of having contracted the infection to be done by recording the body temperature and evaluation of the respiratory symptoms
- Evaluation of the contact and clinical history – contact with a patient with respiratory problems and fever in the previous 2 to 3 weeks.

Inpatient Care:

- All the inpatients to undergo a swab test for COVID-19 as a routine.
- New patients to be separated from the rest of the patients until a negative result is obtained.
- PPE to be used by the medical staff as a mandate.\[26\]
- Mask and gloves to be used in case of asymptomatic patients to avoid droplet infection

Operating Room:

- Test for COVID-19 to be performed before shifting the patient into the operating room
- FFP2 (Filter face piece) respirator without valve and a gown to be worn by the patient
- FFP2 respirator with a valve and a gown and gloves to used by the staff
- Negative pressure to be established in the operating room
- PPE to be worn by every staff member with a watertight sterile gown over it
- Face shield to be worn by the operating doctor and the assisting team member
- Members of the surgical team to be outside the room during intubation and extubation
• Extraoral approach to be used if possible
• Use of osteotome to be considered wherever possible
• Minimum aerosol formation to be a priority
• Use of electric cautery to be avoided and if used should be with a smoke evacuation machine
• The operating room to be cleaned and disinfected 15 minutes after the patient has left the room[32],[33].

Endodontic Practice:

• Dilution of sodium hypochlorite to a concentration of 1% to extend the supply with no compromise on the quality of the treatment
• Rubber dam usage to minimize generation of splatter. Care must to taken to place the rubber dam to cover the nose for an advantage to decrease the spread of the infection.[26]

Pediatric Dental Practice: Riccardo Castagnoli et al.[34] studied COVID-19 positive pediatric patients in China over three months and concluded that children acquired the viral infection from their family members but presented with less severe symptoms than in adults. The prognosis was also better with recovery in 1 to 2 weeks after the onset of the disease.

• Preventive dental behaviors should be promoted

Orthodontic Practice:

• Postpone routine orthodontic appointment as per guidelines of the single Nations
• Follow up of patients experiencing discomfort or problems concerning the orthodontic appliance they are using.[23] Table II below shows the followup procedure for dental patients.

Table II: Orthodontic followup for dental patients

<table>
<thead>
<tr>
<th>Removable appliance</th>
<th>Functional appliance</th>
<th>Broken/does not fit</th>
<th>Send a photograph to the orthodontist and discontinue use after consultation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aligner</td>
<td>Broken/lost</td>
<td>Continue wearing</td>
<td>Wear the previous one and consult the orthodontist</td>
</tr>
<tr>
<td>Retainer</td>
<td>Broken/lost</td>
<td>Consult the orthodontist to help buy hot customizable ones online</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fixed appliances</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Straightwire appliance</td>
<td>Loosened brackets</td>
<td>Send a photograph to the orthodontist</td>
<td>Remove with tweezers</td>
</tr>
<tr>
<td>Poking wire</td>
<td></td>
<td>Send a photograph to the orthodontist.</td>
<td>Cut with the help of a disinfected cutter.</td>
</tr>
<tr>
<td>Poking ligature wire</td>
<td></td>
<td>Send a photograph to the orthodontist.</td>
<td>Use was and then n eraser to push it backward.</td>
</tr>
<tr>
<td>An abscess around the molar band</td>
<td></td>
<td>Send a photograph to the orthodontist.</td>
<td>Antibiotics and analgesics</td>
</tr>
<tr>
<td>Patient activated appliances</td>
<td>Headgear</td>
<td></td>
<td>Discontinue use</td>
</tr>
<tr>
<td></td>
<td>Facemask</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lip bumper</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Palatal expanders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preactivated appliances</td>
<td>Forsus</td>
<td></td>
<td>Send a photograph to the orthodontist once in 2 to 3 weeks.</td>
</tr>
<tr>
<td></td>
<td>Distal jet appliance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| In case of pain/swelling/severe discomfort – visit an emergency dental clinic. |

Discussion

Dental practice: Global outlook during the COVID-19 outbreak: The dental clinic setting increases the risk of cross-contamination and infection between the dental health care worker and the patient. Stern and effective infection control procedures are to be followed by the dental practitioners and hospitals in the countries affected/potentially affected by COVID-19.
After the outbreak of the disease in China in late 2019, routine dental treatment was suspended in January 2020. After three months, the situation is limping back to normalcy\[35]\[36]. Countries closely linked to China, which include Hong Kong, Taiwan, and Singapore, imposed travel restrictions, quarantines, social distancing measures, self-isolation, and heightened hygiene to decrease the arrival of new cases among the community and prevent silent community spread of the pandemic. Routine dental care was closed down just as in China.

The UK NHS’s was of the view that dental practitioners should continue to provide routine dental care for patients who are asymptomatic with no contact history. The general dental practitioners were not comfortable with this advice. They felt that they were morally obliged to reduce routine dental care to decrease the spread of COVID-19 among patients and further into the community. However, the financial consequences of the self-employed dentists were also understandably of concern\[37]. The British Dental Association (BDA) has informed the BBC(British Broadcasting Corporation) that dentists in the united kingdom have been receiving multiple calls from patients who are believed to be in real agonizing pain, with no option of sending them anywhere. As per the British Dental Association, there are a large number of patients who are going untreated; it also says that some of the untreated conditions such as abscesses could lead to facial space infections and thus end up being life-threatening. Patients have been asked to call their local practitioners and seek prescriptions on the phone and obtain them from the pharmacy in case of serious symptoms. Numerous patients are not able to receive emergency appointments as practices are not allowed to see the patient face to face.

Dentistry has been termed as the riskiest of professions in relation to COVID-19 by The New York Times\[38]. The American Dental Association (ADA) has urged the US Department of Health and Human Services to federally recognize licensed dentists to administer point of service COVID-19 tests to test a patient before the procedure henceforth decrease the risk of exposure to the entire dental team.

The ADA has made recommendations for the reimbursement for costs incurred due to the procurement and use of Personal protective equipment(PPE) as well as payments for temporary procedures.\[40] Teledentistry facilities are being made available to the dentists in certain states of USA.\[41]

The dental clinics across the Indian subcontinent have been asked to suspend all non-essential procedures since March 31st, 2020. The Indian Dental Association(IDA), in its bulletin released on March 17th, 2020, titled “Be prepared … but don’t panic” directed the dentists in India to concentrate on emergency dental care and to make a well-informed decision about the patient and their practice.\[42]

COVID-19: Implications faced by patients, dentists, and dental businesses: North American Dental Group (“NADG”), a leading U.S. Dental Service Organization, has reported that a considerable number of Americans have raised significant concerns about seeking dental treatment during the current COVID-19 pandemic. Seventy-one percent of the patients were uncomfortable visiting the dental clinic and wanted to postpone an elective procedure. Only 42 percent of the Americans were confident that their dentist was prepared to prevent the spread of the COVID pandemic.

Dental treatment is expensive and not entirely covered by insurance. A patient to whom oral health has always been of utmost importance is likely to return to the clinic and also bear the costs. However, there will be many who would postpone their visit to the dental beyond the lockdown due to fear or due to economic effects due to job losses, salary cuts, etc. Patients residing in countries who have the lockdown are finding it tough to reach a dentist even in case of emergencies such as broken teeth as a result of biting onto something hard\[43].

The overhead expenses of the dentists in developing and undeveloped countries is expected to rise as the dentist has to procure PPEs. There has been an acute shortage of as well as unclear guidance on PPEs in the United Kingdom.\[44]

There have been severe financial problems faced by dental offices, health care operators, and hospitals as well as insurance companies. As dental treatments are limited only to emergency treatments, the management of patients has become expensive. One of the very adverse impacts of the dental practices being shut down is on the salaries of the dental staff. Unemployment insurance in developed nations could partially cover their requirements.\[45]\[46]

Conclusion

Dentistry: The way ahead

• Change in the approach by the dentist, patient as
well as the government.

- Use of teledentistry to minimize the footfall at the dental clinic.
- Only emergency procedures to be performed.
- Changes in the infrastructure of outpatient and inpatient units, as well as the operating room.
- Adequate supply and use of personal protective equipment by the dental health care team.
- Permission to allow the dentists to take nasal and throat swabs of the patients for the coronavirus.
- Low-interest loans for dental practices.

**Declarations:**

**Ethics Approval and Consent to Participate:**
- Not required

**Consent for publication:**
- All the others duly give consent for the publication of the article

**Availability of data and material:**
- Please contact author for data requests.”

**Competing interest:**
- The authors declare no conflict of interest, financial or otherwise.

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- Not a funded project

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Prevalence of Hearing and Vision abnormalities in School Children in Udupi District Karnataka

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Abstract

Background: Preschool screenings are recommended for early detection and treatment of childhood visual and hearing disorders.

Objective: To evaluate the prevalence of hearing abnormalities, visual impairments and correlate its association with consumption of vitamin A rich food and usage of electronic devices in school going children in Udupi district, Karnataka

Method: Rinnie’s test and Weber’s tests was done by using tuning fork method for hearing, Snellen’s chart for distant vision, Jager’s chart for near vision, Ishiara chart for colour vision and confrontation test for field of vision. Questionnaires were used to get the detailed informations regarding consumption of vitamin A rich food and usage of electronic devices,

Result: Screening test for hearing and vision conducted on 250 students. There was no significant hearing abnormality was found out of 250 students, there was hearing impairment in 1.6% of the children due to ear infection. In vision screening, 12.8% of children having visual abnormalities like myopia, hyperopia and color blindness. The total prevalence of vision abnormalities was 32(12.8%) 95% CI: 11.924-13.676.

Conclusion: Vision and hearing screening is very essential in school children to recognize the visual impairments or hearing abnormalities at earliest which will be helpful for further treatment. This study should be conducted in large sample size.

Keywords: Preschool children, vision, Hearing, screening.

Introduction

The auditory and visual impairment often has an important impact on the physiological as well as psychosocial development of a child; it may also affect their socioeconomic status as they grow older.¹ It is important for the development of sense of hearing, oral language acquisition, verbal capability, reading and writing and for good educational grades.²⁻⁴ Some children with visual defects have much poor academic performance in school. Sometimes this underlying visual defect can cause behavioral impairments like learning disabilities, dyslexia and attention deficit disorder. The major eye problems including refractive errors, color blindness can occur in school children.⁵

The primary need for awareness about Hearing Loss in children is lacking in many parts of the world, it is unnoticed by parents and teachers.⁶ The early identification and rehabilitation of hearing impairments provide great benefits for the child, besides reducing educational and physiological consequences: Hence, a
consensus should be made that the hearing assessment and monitoring should not be carried out only in newborns, but also during the school life. The hearing loss in children can be due to genetic disorders, some viral infectious diseases like swelling of the parotid glands, and meningitis, mechanical injuries. Usage of mobile phone and ear phone in incorrect way causes incurable damage to hearing. It is required to conduct routine clinical examination for hearing abnormality in school children. In initial evaluation of hearing loss cases, audiology estimation may not be readily available for all patients, in such conditions, tuning fork test was done for initial identification which was easily available, inexpensive and easy to use.

The visual requirements in a class room are essential for child’s study as well as for their achievement. The visual efficiency impairment that may impact on learning potential includes eye discomfort, inattention, and task avoidance etc. Most of the time, small children may not be knowing about their visual problem as they are not able to explain their simultaneous associated symptoms. One of the most frequent visual impairments that might occur in early school age children are the refractive errors. Visual impairments left untreated can lead to both short- as well as long-term physical and psychological problems, including physical and verbal bullying, depression, anxiety, poor visual motor skills, low self-esteem, problems in school as well as work site, and accidents and injuries.

One of the most important causes of preventable blindness in young children is Vitamin-A-Deficiency (VAD), because vitamin A is important for the synthesis of pigment of rods and cones. As per the recent World Health Organization (WHO) estimation, VAD has medium and high public health significance in 45 and 122 countries all around the world, respectively.

Extensive use of computers and other electronic devices in children’s may make them more susceptible to the development of visual problems compared to that of adults. It may cause eye discomfort, fatigue, blurred vision, headaches, dry eyes and other symptoms of eyestrain. These symptoms may be due to poor lighting, glare, an improper work station set-up, or vision problems.

Therefore, the aim of the present study is to assess the hearing sensitivity, the prevalence of vision abnormalities and its association with the consumption of Vitamin A rich food and usage of electronic devices among school children in Manipal, Udupi district, Karnataka.

Materials and Method

Ethical approval for conducting the study was obtained from Institutional Ethics Committee of Kasturba Medical College and Kasturba Hospital, Manipal. (IEC/103and 127). Before doing the study, the permission from the school principal were taken. The consent forms and questionnaires were collected from the parents enrolled to ask for their permission to assess their child’s hearing and vision and to allow their children to participate in the study. The accepted parents written consent were taken, then the procedure and tests were explained to the children. In our cross sectional study total two hundred and fifty primary and higher primary school children both male and female within the age group of 9-12 years, were screened.

Materials required: Tuning Fork (265 cycles/sec), Snellen’s chart, Jaeger’s chart, Ishihara chart and Questionnaires

Method

Tests for Hearing:

Weber’s test: Identifies asymmetry of hearing.

Tuning fork was struck and placed high on the forehead in the midline. The subjects were asked whether the sound was louder in one ear or equally heard in both ears.

Rinne’s test: It identifies the presence of conductive hearing loss.

This test compares patient’s Air conduction (AC) hearing with his Bone conduction (BC). Hearing light vibrating tuning fork was placed on the mastoid bone, behind the ear. When the patient can no longer hear the sound, quickly place the fork close to the ear canal and asked whether he could hear the sound or not.

Questionnaires: A detail history of each subject is carried out by questionnaire (Figure-1), The questionnaire had 12 YES or NO questions which are suitable for this study and easy to understand. The parental questionnaire had questions related to the children’s audiology related problem.
1. Did your child ever have any hearing abnormality? ( ) Yes ( ) No
2. Do you think your child hears well? ( ) Yes ( ) No
3. Does your child seem to hear better on some days rather than other days? ( ) Yes ( ) No
4. Does anyone in the family present hearing impairments? ( ) Yes ( ) No
5. Was there any complication during pregnancy or birth? ( ) Yes ( ) No
   If yes, which one? _______________________________
6. Did your child ever have ear infections or other ear problems? ( ) Yes ( ) No
   If yes, which one? _________________________________
7. Did your child ever have any ear surgery? ( ) Yes ( ) No
8. Does your child use cotton swabs to clean his/her ears? ( ) Yes ( ) No
9. Does your child have any health problem? ( ) Yes ( ) No
   If yes, which one? _________________________________
10. Does your child present learning difficulties in school? ( ) Yes ( ) No
11. Does your child respond soon whenever you are calling him/her? ( ) Yes ( ) No
12. Does your child present language or speech problems? ( ) Yes ( ) No

Adapted from Guerra-silva and Lacerda(3)

Test for visual acuity-distant vision and near vision.

Distant vision-subjects were seated at a distance of 6 meter from the snellen's chart and were asked to read the chart with each eye separately till the line where he/she were able to read comfortably.

Near vision- subjects were asked to read the jaeger’s chart from each eye separately, holding the chart at a distance of 10-12 cm from them.

Test for Color vision- the subjects were asked to read the ishihara chart by each eye separately. Field of vision was tested by using finger confrontation method for both the eyes separately.

**Questionnaires:** The questionnaires related to the consumption of vitamin A rich food and the usage of electronic devices were included.

**Questionnaires**

**Section--A**

1. What is your child like to have more frequently (Fruits/Vegetables)
   If fruits what kind ……………
   If Vegetables what kind ……………
2. Do your child is taking meals with Carrots? (Yes/No)
   If yes how frequently? (Daily/Twice in a week/Weekly once/Monthly twice)
3. Do your child is taking meals with Green leafy vegetables? (Yes/No)
   If yes, how frequently? (Daily/Twice in a week/Weekly once/Monthly twice)
4. Do your child taking meals with Sweet potatoes? (Yes/No)
   If yes, how frequently? (Daily/Twice in a week/Weekly once/Monthly twice)
5. If your child is non-vegetarian, Please answer the following questions?
   A. Do your child is taking meat? (Yes/No)
      If yes, how frequently? (Daily/Twice in a week/Weekly once/Monthly twice)
   B. Do your child is taking Poultry (egg)? (Yes/No)
      If yes, how frequently? (Daily/Twice in a week/Weekly once/Monthly twice)
   C. Do your child is taking seafood’s (fish)? (Yes/No)
      If yes, how frequently? (Daily/Twice in a week/Weekly once/Monthly twice)
6. Are you aware of Vitamin A deficiency (Yes/No)
7. Do you think that your child take regularly Vitamin A foods based on the daily need of Body? (Yes/No/Not sure)
8. Did you visit any doctors for nutritional disorder for your child? (Yes/No)
   
   If the previous answer is yes, answer the following questions:
   
   • What kind of deficiency/disease? ______________
   
   • Taking any kind of supplement ______________

Section-B

9. Which of the following electronic devices your child using regularly?

   () Television
   () Mobile
   () Laptop
   () Tablets
   () Smart Phone
   () All the above

11. In a day how long your child spend time on the following devices and services?

<table>
<thead>
<tr>
<th>11. Technological Devices and Services</th>
<th>Not using</th>
<th>Below 1hr</th>
<th>1-2hrs</th>
<th>Above 2hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Television</td>
<td>Video</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Games</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile Phones</td>
<td>Messaging</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Video Calling</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Internet</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Video</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Games</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computers or Laptops</td>
<td>Video Calling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Internet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Video</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Games</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The questionnaires were given to the child and parent.

**Statistical Analysis:** The data was analyzed using IBM SPSS statistics 15 data editor. Descriptive statistics such as frequency and percentage were used at 95% of confidence interval for 250 samples. The level of significance was set at 5% absolute precision and 95% confidence interval for vision. The confidence interval for hearing was estimated to be +1.96.

**Result**

In our study, the hearing test was conducted by Rinne’s test and Weber’s Test and questionnaires. There was no any significant hearing abnormality.

In weber’s test, all the 250 students could hear equally on both the ears. There was no lateralization.

<table>
<thead>
<tr>
<th>Table 1: Showing the results of weber’s test in primary and higher primary school children in UDUPI district Karnataka</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heard equally on both sides</strong></td>
</tr>
<tr>
<td>250 (100%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2: Showing the results of rinne’s test in primary and higher primary school children in UDUPI district Karnataka</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rinne’s positive</strong></td>
</tr>
<tr>
<td>250 (100%)</td>
</tr>
</tbody>
</table>
The data collected from the parental questionnaire about child hearing reported that, out of 250 students, 1.6% of parents said that their child heard better on some days as compared to other days, 4% presence of hearing impairments in the family, 1.6% of the children had ear infection, 0.4% had difficulty in learning. No student has undergone ear surgery.

In our study, the data collected by the questionnaire, related to the ear hygiene and use of ear phones has reported that, Out of 250 students 2% of students reported ear problem, 95.2% of the students cleaning their ears regularly. Out of which, 24% cleaning the ears once in a week, 67.6% once in two weeks, 8.4% once in a month and 4.8% are not. 7.2% of the students are using ear phones, range of volume 0.8% ‘mild’, 98.8% ‘medium’ and 0.4% ‘high’.

In vision screening, out of 250 students, 12.8% children having visual abnormalities includes myopia, hyperopia, color blindness. 4.4% children, were already wearing glasses having Myopia or Hyperopia were also included in this study. 7.2% of the children had myopia 4.8% of color blindness, 0.4% had hyperopia. Field of vision for all the 250 children was normal. (Table 3).

Table 3: Distribution of frequency and percentage of vision screening in 9-12 years age of total 250 school children

<table>
<thead>
<tr>
<th>Vision Screening n (%)</th>
<th>Distant vision</th>
<th>Near vision</th>
<th>Color vision</th>
<th>Field of vision</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Children with &gt;6/6</td>
<td>Children with &lt;6/9</td>
<td>Children with &gt;J₅</td>
<td>Children with &lt;J₄</td>
</tr>
<tr>
<td>231(92.4)</td>
<td>19(7.6)</td>
<td>249(99.6)</td>
<td>1(0.4)</td>
<td>238(95.2)</td>
</tr>
</tbody>
</table>

Table 4: Prevalence of vision abnormalities in school children based on the vision screening

<table>
<thead>
<tr>
<th>Ocular disorders</th>
<th>Prevalence n (%)</th>
<th>95% Confidence interval (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myopia</td>
<td>19 (7.6)</td>
<td>6.72, 8.46</td>
</tr>
<tr>
<td>Hyperopia</td>
<td>1 (0.4)</td>
<td>0.476, 1.276</td>
</tr>
<tr>
<td>Color blindness</td>
<td>12(4.8)</td>
<td>3.924, 5.676</td>
</tr>
<tr>
<td>Total</td>
<td>32 (12.8)</td>
<td>11.924, 13.676</td>
</tr>
</tbody>
</table>

In our cross sectional study, The prevalence of myopia was 7.6% (95% CI: 6.72 – 8.46), hyperopia was 0.4% (95% CI: 0.476 – 1.276), and color blindness was 4.8% (95% CI: 3.924 – 5.676). The total prevalence of vision abnormalities among three school children in Manipal, Udupi District, Karnataka was 32(12.8%) 95%CI: 11.924 – 13.676.

The Consumption of vitamin A rich foods was collected by questionnaires method. Among 250 children, 240(96%) children were taking carrot, two hundred and nineteen (87.6%) children taking green leafy vegetables, one hundred and ninety-nine (70.6%) were taking meat, two hundred and seventeen (86.8%) children were taking egg and one hundred and eighty (72%) children were taking fish.
Table 5: Distribution of frequency and percentage of consumption of vitamin A rich food in 250 school children

<table>
<thead>
<tr>
<th>Food</th>
<th>Not Taking n (%)</th>
<th>Daily n (%)</th>
<th>Twice in a Week n (%)</th>
<th>Weekly Once n (%)</th>
<th>Monthly Once n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrot</td>
<td>10(4)</td>
<td>48(19.2)</td>
<td>99(39.6)</td>
<td>88(35.2)</td>
<td>5(2)</td>
</tr>
<tr>
<td>Green leafy Vegetable</td>
<td>31(12.4)</td>
<td>43(17.2)</td>
<td>116(46.4)</td>
<td>54(21.6)</td>
<td>6(2.4)</td>
</tr>
<tr>
<td>Meat</td>
<td>51(20.4)</td>
<td>6(2.4)</td>
<td>12(4.8)</td>
<td>171(68.4)</td>
<td>10(4)</td>
</tr>
<tr>
<td>Egg</td>
<td>33(13.2)</td>
<td>19(7.6)</td>
<td>28(11.2)</td>
<td>159(63.4)</td>
<td>11(4.4)</td>
</tr>
<tr>
<td>Fish</td>
<td>70(28)</td>
<td>8(3.2)</td>
<td>20(8)</td>
<td>142(56.8)</td>
<td>10(4)</td>
</tr>
</tbody>
</table>

Table 6: Distribution of frequency and percentage of electronic device in 250 school children

<table>
<thead>
<tr>
<th>Device</th>
<th>Not using n (%)</th>
<th>Below 1 hours n (%)</th>
<th>1-2 hours n (%)</th>
<th>Above 2 hours n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Television</td>
<td>38(15.2)</td>
<td>90(36)</td>
<td>108(43.2)</td>
<td>14(5.6)</td>
</tr>
<tr>
<td>Mobile</td>
<td>135(54)</td>
<td>46(18.4)</td>
<td>32(12.8)</td>
<td>37(14.8)</td>
</tr>
<tr>
<td>Computer or Laptop</td>
<td>242(96.8)</td>
<td>4(1.6)</td>
<td>3(1.2)</td>
<td>1(.4)</td>
</tr>
</tbody>
</table>

The daily usage of electronic devices (television, mobile phones, computer or laptop) of children was collected by using questionnaires method. Among 250 children, 212 (84.8%) children were daily watching television, 115 (46%) children using mobile phone, and 8(3.2%) children were using computer or laptop.

Discussion

Normal hearing and vision are very essential in school children, as it affect their learning. The current study involved in assessing the prevalence of Hearing Loss and vision among primary and higher primary school children in Udupi district of Karnataka State.

The primary need for awareness about Hearing Loss in children is lacking in many parts of the world, it is unnoticed by parents and teachers. The early identification and rehabilitation of hearing impairments provide great benefits for the child, besides reducing educational and physiological consequences: Hence, a consensus should be made that the hearing assessment and monitoring should not be carried out only in new-borns, but also during the school life.

The most common hearing disorder is unilateral hearing loss, which is found approximately in 3% of school age children. Conductive hearing loss, which is more frequent in the month of fall and winter due to the weather, may be considered the most common cause in the school age hearing screening.

One of the study reported that the behaviour of students can give the hints about any issues with being non-responsive to name call, not attentive in class, frequently asking the other person to repeat the sentence or question, concentrating on the teacher’s lip movements and being inattentive in classroom, preferring social isolation being passive and easily getting tired, are due to hearing loss in children.

Sometimes, the results of the child being detected with hearing impairments can take a different dimension where the caretakers wrongly diagnose or classify these children as Inattentive or being hyperactive, or label them to have poor educational grades, which is another result of being unaware of the child’s hearing loss issues.

Studies have reported that, at the initial stages, it is difficult to detect any minor hearing loss without any additional audiology related clinical evaluation. The significant relationship between some of the answers from caregivers and the procedure performed in the school age hearing screening demonstrates that it is possible to associate the use of questionnaire along with the test in hearing screening, and had aim to analyse the effectiveness of a low cost screening instrument. Which further concludes that the questionnaires may be used to classify children as having normal hearing or hearing impairments. Furthermore, they pointed out that developing low-cost strategies can help in caring for children with hearing impairments in developing countries.
In our study, there was no hearing abnormalities observed. The reason for observing no hearing loss in these cases is that the occurrence of hearing abnormalities is very less and also factors such as, the child’s response being very casual, not relevant to the question, or just a simple lack of awareness about their own hearing sensitivity.

There was 7.6 % total prevalence of vision abnormality in 250 school children out of that major prevalence was due to myopia, which was lower as compared to other studies done on prevalence in India. Similar type of prevalence of vision abnormalities in children were reported in different studies in India like, 20.2% of refractive errors were found in rural area of coastal Karnataka, 27.1% of children having refractive errors in Pune, 5.22% of Prevalence were found in urban female school children in Surat, 4.3% of school children having refractive error in Maharashtra. In our study, 0.4% of children were having hyperopia 2.5% of hyperopia was reported in urban school children of low income families in Kolkata, 4.91% of school children in Madhya Pradesh.

Vitamin A deficiency (VAD) is an important cause of nutritional blindness in young children and VAD causes more than 250,000 children to go blind in Asia each year; 52,500 such cases per year are from India. A survey conducted in 1992, in 3 primary schools in a rural area of India’s southwest Maharashtra State, assessed the prevalence of vitamin A deficiency (9.8%) among children, 5-15 years of age. Around 72% of children were found VAD in urban school children of low income families in Kolkata, 4.91% of school children in Madhya Pradesh.

In our study, 4.8% prevalence of color blindness which is not significant. It was reported 2.3% children were having color blindness in Pune.

In our study, 0.4% of children were having hyperopia 2.5% of hyperopia was reported in urban school children of low income families in Kolkata, 4.91% of school children in Madhya Pradesh.

In our study, association of the visual impairments with the consumption of vitamin A rich food and electronic device usage in among school children cannot be analysed statistically, as the numbers of children who have vision abnormality in the sample are scanty.

**Conclusion**

In our study we used tuning fork test and questionnaires for hearing loss, Snellen’s chart, Jagger’s chart and ischiara chart and questionnaires for Vitamin A consumption and usage electronic devices for vision abnormalities. Advance techniques can be used to screen even minute hearing loss, to assess the minute thresholds of the hearing capacity, with sound proof assessment set-up like pure tone audiometry, tympanometry etc, developing a new questionnaire which is easy and suitable for this hearing screening in school children."Vision screening", is an efficient as well as cost-effective method to recognize the children who are dealing with visual impairments which can lead to blindness, and loss of vision in children influences their academic opportunities, career choices, and social life, those children can be referred to ophthalmologist for further treatment.

In our study we got lesser prevalence of vision abnormalities and hearing loss which could be due to smaller sample size and as this study was conducted in government school children, it can be studied in larger size and compared with private school children.

**Ethical Clearance:** Taken from Human ethics committee.

**Source of Funding:** Self

**Conflict of Interest:** Nil.

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Perception of Dental Students about Tooth Carving in Dental Education at a Tertiary Level Health Care Facility

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Abstract

Tooth carving on wax/plaster/plastic to reproduce reference models of teeth is used to teach dental students anatomy of the tooth. There is a ongoing debate on value of tooth carving exercise in undergraduate dental curriculum. Perception of students on utility of tooth carving is important in planning dental curriculum.

Objective: The present study seeks to analyze the perception of undergraduate dental students about tooth carving, its relevance and utility in future clinical practice. The various aids preferred by them to learn dental carving.

Method: Student’s perception was assessed using a self administered questionnaire.

Results: Total 58 students participated in the study (36 girls and 22 boys). Both male and female students perceived that video demonstration of tooth carving, a improved carver design and having a collection of 32 natural teeth in the department and attending workshops will help in more accurate and better understanding of tooth carving. More male students perceived that dental carving will be helpful in their clinical practice compared to females. Majority of students believed that the course content on carving was adequate. 90% of ³rd year students perceived that attending workshops would improve their knowledge on carving compared to 66% ²nd year students and the difference was found to be statistically significant. A higher proportion of ²nd year students compared to ³rd year students perceived that improved carver design would help them carve more accurately. More ³rd year students felt that the course content on carving was adequate. Majority of students perceived that multimedia presentations were the most effective educational aid for teaching tooth carving. Majority of students perceived that having handouts of presentations and POP models will be beneficial to them in learning tooth carving.

Conclusion: There is a need to revise the curriculum emphasizing on the utility of tooth carving in clinical practice. Also there is a need to adopt new innovative method at teaching dental carving, improving on carver design and enriching the course content with emphasis on competency and skills since many students even after having exposure to carving felt the need for further workshops.

Keywords: Dental Carving, Perception, Survey.

Introduction

Dental anatomy, taught in the preclinical years forms the foundation of sound routine dental practice in later years. Students learn the external and internal morphology of each individual tooth and the relationship between teeth within the arch and between arches of both
primary and permanent dentition. Tooth carving on wax/plaster/plastic to reproduce reference models of teeth is used to teach dental students anatomy of the tooth. Carving has been advocated for developing cognitive and motor skills.1-2 By carving teeth anatomy, the dental student begins to develop psychomotor skills for restoring the teeth to proper form and function.2 Students acquire the knowledge to identify teeth, recognize and diagnose tooth anomalies and treat or manage dental pathology.

There is an on-going discussion about the value of tooth carving exercise in the undergraduate dental curriculum. Opinions vary on the effectiveness of the tooth carving exercise and its relevance to students’ later dental practice. Perception of students on utility of tooth carving is important in planning dental curriculum.

The aim of this study was to analyze the perceived importance of tooth carving among undergraduate dental students during their training.

Methodology

The present study was a cross sectional survey carried out among 2nd and 3rd year dental undergraduate students exposed to tooth carving at a tertiary level dental care facility in central Uttar Pradesh. The 2nd and 3rd year students attending lectures of Oral Pathology and Microbiology, King George Medical University, were informed about the purpose of the study and were given a self administered questionnaire to assess their perception on 6 different parameters concerned with Tooth Carving. Students willing to participate in the study, after obtaining the informed consent from all the participant explaining the procedure, were then asked to fill the questionnaire and those not interested were asked to return the questionnaire blank at the end of the lecture. Questionnaire was kept anonymous. Students were asked to only mention but to mention their gender, age and year of BDS. Data was tabulated in Ms Excel and was analyzed using WHO Epi Info software. Statistical difference in perception of students was tested for gender and year of BDS using Chi Square test for proportion.

Results

A total of 58 dental students participated in the survey. Of the students surveyed 40 were 3rd year dental students and the rest were 2nd year students. All students had exposure to carving tooth. 38 students had carved complete set of teeth. Amongst students who had carved complete set of teeth 15 were from 2nd year and 23 were from 3rd year BDS.

Table 1: Age and gender wise distribution of study participants

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤20 years</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>20-25 years</td>
<td>17</td>
<td>28</td>
</tr>
<tr>
<td>&gt;25 years</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>36</td>
</tr>
</tbody>
</table>

Table-1 shows the age and gender wise distribution of study participants. Total 58 students participated in the study of which 36 were girls and 22 were boys. Mean age of male and female study participants was 20.5 and 21.5 years, respectively. Majority of study participants, about three fourth i.e. 17 (77%) boys and 28 (77%) girls were aged between 20 to 25 years. About 19% of female study participants were less than 20 years of age compared to fewer boys about 13%.

Table 2: Perception of dental students on tooth carving by gender

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Parameters</th>
<th>Response</th>
<th>Male</th>
<th>Female</th>
<th>Chi Square, p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Video demonstration of tooth would be more helpful</td>
<td>Yes</td>
<td>18 (82%)</td>
<td>25 (69.4%)</td>
<td>1.232, p=0.54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>1 (4.5%)</td>
<td>4 (11.1%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Idea</td>
<td>3 (13.6%)</td>
<td>7 (19.4%)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Improved carver design would help carve more accurately</td>
<td>Yes</td>
<td>17 (77.3%)</td>
<td>28 (77.7%)</td>
<td>0.32, p=0.848</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>2 (9%)</td>
<td>2 (5.5%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Idea</td>
<td>3 (13.6%)</td>
<td>6 (16.7%)</td>
<td></td>
</tr>
</tbody>
</table>
Table 2 shows the comparison of perception of male and female dental students on tooth carving. No significant difference was observed between male and female students with regard to their perception about tooth carving on 6 parameters studied. Both male and female students perceived that video demonstration of tooth carving would be more useful. Male students compared to females had a higher preference for video demonstration of tooth carving. About 77% i.e. three fourth of both male and female students believed that a improved carver design would help them carve tooth more accurately. While 82% male students perceived that dental carving will be helpful in their clinical practice, about 39% (i.e. more than one third) of female students had no idea, whether dental carving will be helpful in their clinical practice. Majority of male and female students about 90% perceived that having a collection of 32 natural teeth in the department will help more in better understanding of tooth carving. About 82% of both male and female students perceived that course content on carving was adequate. However, 10% students did not agree to the same and reasons for the same needs to be looked in. Majority of both male and female students were of the opinion that attending workshops would improve their knowledge of carving. More female students compared to males were interested in attending workshop on tooth carving.

Table 3: Perception of dental students on tooth carving by year of BDS

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Parameters</th>
<th>Response</th>
<th>2nd Year</th>
<th>3rd Year</th>
<th>Chi Square, p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Video demonstration of tooth would be more helpful</td>
<td>Yes</td>
<td>12 (66.6%)</td>
<td>29 (72.5%)</td>
<td>0.95, p=0.62</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>4 (22.2%)</td>
<td>5 (12.5%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Idea</td>
<td>2 (11.1%)</td>
<td>6 (15%)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Improved carver design would help carve more accurately</td>
<td>Yes</td>
<td>15 (83.3%)</td>
<td>30 (75%)</td>
<td>0.50, p=0.77</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>1 (5.5%)</td>
<td>3 (7.5%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Idea</td>
<td>2 (11.1%)</td>
<td>7 (17.5%)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Dental carving will be helpful in my clinical practice</td>
<td>Yes</td>
<td>12 (66.6%)</td>
<td>26 (65%)</td>
<td>0.07, p=0.96</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>1 (5.5%)</td>
<td>3 (7.5%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Idea</td>
<td>5 (27.8%)</td>
<td>11 (27.5%)</td>
<td></td>
</tr>
</tbody>
</table>
Table 3 shows the comparison of perception of 2nd year and 3rd year dental students on tooth carving. No, significant difference was observed between 2nd year and 3rd year students with regard to their perception about tooth carving on the parameters studied (5 out of 6), except for their perception on attending workshops would improve their knowledge of carving. 90% of 3rd year students perceived that attending workshops would improve their knowledge on carving compared to 66% 2nd year students. A higher proportion of 2nd year students compared to 3rd year students perceived that improved carver design would help them carve more accurately. More 3rd year students felt that the course content on carving was adequate.

![Fig. 1: Receptivity of dental students to tooth carving lectures early morning](image)

Figure 1 shows the perception of dental students regarding tooth carving lectures in morning. Majority of students (i.e. 62%) were more receptive to having tooth carving lectures early morning. However, about one third of students didn’t agree with the same and reasons for the same needs to be explored.
Figure 2 shows the perception of dental students regarding part of tooth anatomy crucial for clinical subject. While about 26% students were of the opinion that understanding the anatomy of Crown of tooth was crucial for clinical practice in later years, majority of students perceived that knowing the anatomy of both crown and root was crucial.

Figure 3 shows the perception of dental students with regards to the different available education aids for better understanding and learning of tooth carving. Majority of students perceived multimedia presentations were the most effective educational aid for teaching tooth carving. Chalk and board didn’t find much preference. Majority of students perceived that having handouts of presentations and POP models will be beneficial to them in learning tooth carving.
Discussion

In the present study a total of 58 dental students participated of which 40 were 3rd year dental students and the rest were 2nd year students. All students had exposure to carving tooth.

In our study both male and female students perceived that video demonstration of tooth carving would be more useful. Male students compared to females had a higher preference for video demonstration of tooth carving. Similar results were reported in a previous study by Yara Oweis et al where many students found video demonstration of tooth carving to be very valuable if used in addition to live demonstrations. Many students asked for the videos to be made available for them at home to be used while practicing outside lab hours. Another study by JP Ennes et al found that most students agreed that the wax models and technique demonstration videos aid in understanding the stages of the technique.

In our study 82% male students perceived that dental carving will be helpful in their clinical practice, about 39% (i.e. more than one third) of female students had no idea, whether dental carving will be helpful in their clinical practice. Similar findings were reported in a previous study by Mayank T et al, where majority 62.3% of survey respondents agreed that carving influenced their knowledge of tooth anatomy. They believed that carving was helpful in restorative dentistry (62.6%), understanding dental occlusion (53.8%) and overall improved their clinical skills (65%).

The findings of our study reveal that majority of male and female students perceived that having a collection of 32 natural teeth in the department will help more in better understanding of tooth carving. Previously published literature has reported that some educators believe that the tooth anatomy can be learned by collecting and studying of intact extracted teeth.

About 82% of both male and female students perceived that course content on carving was adequate. However, 10% students did not agree to the same and reasons for the same needs to be looked in. Majority of both male and female students were of the opinion that attending workshops would improve their knowledge of carving. More female students compared to males were interested in attending workshop on tooth carving. This is in accordance with study conducted by Abu et al. In doing this their horizon will broaden about the subject and the students might find the monotonous carving interesting this further lays their foundation for being better clinicians in future.

In our study majority of students perceived multimedia presentations were the most effective educational aid for teaching tooth carving. Chalk and board didn’t find much preference. Majority of students perceived that having handouts of presentations and Plaster of paris models will be beneficial to them in learning tooth carving. A previous study by Maggio MP et al reported that interactive media module was just as effective as the traditional classroom method for successful dissemination of foundational knowledge in dental morphology. The online module was found to positively engage the students and was preferred by students, however it was not regarded as a total replacement for the traditional course.

Conclusion

There is a need to revise the curriculum emphasizing on the utility of tooth carving in clinical practice. Also there is a need to adopt new innovative method at teaching dental carving, improving on carver design and enriching the course content with emphasis on competency and skills since many students even after having exposure to carving felt the need for further workshops. The training of skills of dental anatomy/tooth morphology can be enhanced using various current technologies like computer animated graphics, implementation of CAL programs, 3D images, digital atlases, photorealistic 3D models of human teeth and NEVO scanner with E4D compare software.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: Ethical Clearance was not required.

Reference


Abstract

Introduction: Oligohydramnios is an extremely rare condition where there is a deficiency of liquor amnii in the amount of less than 200ML at the time of delivery. Sonographically, it is a maximum vertical pocket of liquor is < 2 cm or the amniotic fluid index is < 5 cm (less than 5 percentiles) is specified.

Patient History: A 23 years old ANC & 8 months mother was admitted on 11.9.2019 with the complaints of reduced fetal movements and abdominal discomfort.

Past History: Patient has history of blood transfusion 3months back and has history of cervical cerclage at 7months of pregnancy.

Clinical Findings: Reduced fetal movements, abdominal discomfort, leaking of the amniotic fluid, low amniotic fluid on ultrasound, low maternal weight gain, pre labor rupture of membranes.

Investigations: Ultrasonography (AFI=5cm), Hb%-9.1gm%, MCV-74, MCH-23.5pico/gm, HCT-28.5%, Total WBC Count–8000/cu.mm, Lymphocytes-20%.

Surgical Management: Patient does not have any past surgical history.

Medical Management: Tab. AFI plus BD, L- Arginitrate sachet 5gm/BD/orally, Tab. iron OD, Tab. Calcium OD.

Nursing Management: Assess both maternal and fetal conditions carefully, fetal heart rate and vital signs should be assessed properly. During labor, an amnio-infusion should be given via intrauterine catheter. Fluid should be administered via amniocentesis before giving birth. The level of amniotic fluid may help by increasing the amount of oral fluid intake.

Conclusion: Patient was admitted to AVBRH and was diagnosed as oligohydramnios and got appropriate treatment and her condition has improved.

Keywords: Oligohydramnios, amniotic fluid, cervical cerclage, amniocentesis.
in abdomen, pain in the lower back and reduced fetal movement.

**Past History:** Patient has history of mild anemia 3 months back where she has undergone the blood transfusion and she has history of cervical cerclage in 7 months of pregnancy for which the patient was hospitalized, she complaints pain in lower back and reduced fetal movement since 1 month back and came to AVBRH for further management.

**Past Interventions and Outcome:** My patient was diagnosed as oligohydramnios at 7 months of pregnancy where cervical cerclage has done at that time, from that time onward patient was admitted to hospital time to time for treatment. The treatment was found effective as the patient does not develop complications till then.

**Obstetric History:**

**Menstrual history:**
Age of menarche- 14 years
Duration of menstrual period- 3-4 days
Duration of cycle in days- 28 days
Regularity- regular
LMP – 28/6/19
EDD – 4/3/2020
POG – 32.2 wks

**Antenatal assessment:**
Weight – 45 kgs
Height – 15 cm
Edema – absent
Previous no. of antenatal visits – 2 visits
Treatment – patient has taken 2 doses of TT injection, and she’s taking iron and calcium tablets.

**Clinical Findings:** Reduced fetal movements, abdominal discomfort, leaking of the amniotic fluid, low amniotic fluid on ultrasound, low maternal weight gain, pre labor rupture of membranes.

**Etiology:**
1. **Fetal conditions**- fetal chromosomal or structural anomalies, renal agencies, obstructed uropathy, spontaneous rupture of the membrane, intrauterine infection, post maturity, intrauterine growth retardation.
2. **Maternal conditions** - hypertensive disorders, uteroplacental insufficiency, dehydration, idiopathic.

**Investigations:**

1. **CBC**
   - HB% - 9.1 gm%
   - Total RBC Count – 3.87 mil/cu.mm
   - Total WBC Count – 8000/cu.mm
   - Total platelets count – 1.83 lacs/cu.mm
2. **LFT**
   - Total bilirubin – 0.6 mg/dL
   - SGPT – 20 U/L
   - SGOT – 40 U/L
3. **USG**
   - Single cell uterine fetus with 32.2 wks with oligohydramnios
   - AFI = 5CM

**Therapeutic Intervention:**
1. First trimester – counselling, serial USG
2. Second trimester – counselling, consider amnioinfusion, serial USG, termination of pregnancy SOS
3. Third trimester – deliver post term cases, serial USG & Doppler in IUGR, conservative management for protein pre-labor rupture of membranes till 34 weeks.

**Medical Management:**
- Tab. AFI plus BD
- L- Argininate sachet 5gm/BD/orally
- Tab. iron OD
- Tab. Calcium OD

**Nursing Management:**
- Assess both maternal and fetal conditions carefully, fetal heart rate and vital signs should be assessed properly. During labor, an amnio-infusion should be given via intrauterine catheter.
- Fluid should be administered via amniocentesis before giving birth.
- The level of amniotic fluid may help by increasing the amount of oral fluid intake.
Discussion

The patient 23 years old was apparently admitted in AVBRH on date 11/09/2019. Patient complaints of pain in the lower abdomen, lower back and decreased fetal movement, as she has complaints all this things patient was underwent several investigations like blood investigation, ultrasonography. After all this investigation patient was diagnosed as oligohydramnios where her amniotic fluid index(AFI) was 5cm. The condition of patient was improved after getting care by various multidisciplinary health care team. She was admitted in the ANC ward for further management.2,3

A clinical trial on oligohydramnios during the third trimester of pregnancy was done in 2012 at Moradabad city, U. P. The results shows that 24. 583. 99 SD was the patient mean age and out of these 46. 15% were the age between 21-25 years. 36% were primigravida and 64% patients were multigravida. Among 78 pregnant women 74% was mild oligohydramnios and 25% was severe. Around 68% were preterm delivered which means who delivered before completing 37 weeks of gestational age. 72% cases were delivered by caesarean section, out of all these 51% were due to fetal distress, 33% were normal Cardiotocography (CTG) and 66% were abnormal at the time of admission. The normal colour of the amniotic fluid was found in 69% cases at the time of membrane rupture whereas 31% cases meconium stained was found. Mostly, in severe oligohydramnios the chances of caesarean section was high than the mild and moderate oligohydramnios group. Perinatal outcome like Apgar score, weight of the baby, meconium aspiration syndrome, respiratory distress syndrome and neonatal ward admission. 65% cases were found to be low birth weight baby among 78 newborn babies. Among 78 babies, 21 babies APGAR score was less than 7 at 5 minutes. Respiratory distress syndrome was suffered by 15% babies and 10% were suffered meconium aspiration syndrome. Due to all these complications 15 babies were admitted to NICU.4,5

Oligohydramnios is well known to be associated with high adverse risk during the perinatal period. However, it is a poor indicator for the adverse effects during this period. But it is also used as a predictor for delivery.6,7 So, closely monitoring of the volume of amniotic fluid during antenatal period is very helpful to find out the risk of the adverse effects during perinatal period.8,9

Conclusion

Oligohydramnios is one of the most common complications during the pregnancy which can cause maternal mortality and morbidity. But if it is diagnose in early stage and if it is treated properly we can reduce the maternal and fetal complications. My patient has received proper care and her conditions also improved as evidenced by the patient conditions and the treatment is still going on till my last date of care.

Ethical Clearance: Taken from institutional ethics committee.

Source of Funding: Self.

Conflict of Interest: Nil.

References

Case Report on Full Term Normal Delivery

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Abstract

**Background:** Labor has been defined as that of the initiation of periodic painful contractions of progressive deletion as well as dilation of a cervix, followed by a decent part going to lead to the expulsion of its fetus & placenta from the uterus of mother. Post-natal treatment was its individualized treatment provided that meet the needs of the baby and mother after delivery/childbirth.

**Case Report:** Mrs. Nikita Matram 25-year-old female was admitted in AVBR Hospital with the complaint of pain in abdomen and increased fetal movement on date 4/01/2020 and she delivered female baby on date 6/01/2020 and the baby weight was 2.8 kg at 1:40 am now her complaint was pain on suture side and weakness. but the patient has a previous history of abortion after marriage of four month two and half month of baby was abort. That time dilatation and curettage was done.

Patient delivered female baby throughout the vaginal delivery and baby and mother was normal after delivery baby was kept with mother on same bed and initiate breastfeeding within one hour after delivery.

**Conclusion:** Case report conclude that after normal delivery and post-natal care mother and baby was normal.

**Keywords:** Full term normal delivery, post-natal care, newborn, delivery.

Introduction

Giving birth, commonly defined of labor and birth, seems to be the conclusion of pregnancy once an or maybe more kids exit the mother via going through the womb or even the caesarean delivery and, throughout delivery, a baby is released through the womb. There are different forms of vaginal delivery. Supported vaginal and instrumental vaginal birth, accidental vaginal delivery, triggered vaginal birth, natural vaginal delivery.

Treatments that are consistent to protection. Given medical and scientific innovations through managing complex health problems, this same current setting with maternity services had also increased rates for healthy mothers and infants. There have been fears all around the community that evidence-based strategies and procedures across labour and childbirth are standard occurrence.¹ There is significant mis-use of advantageous techniques, over-use of detrimental or inefficient method, or lack of desire and over consequences of insufficiently measured method.² Enhance the efficiency with maternity services for both developed and emerging nations is an essential part with efforts to reduce maternal and infant mortality and morbidity.

**Case Presentation:** Mrs. Nikita Matram 25-year-old female diagnosed with G2,A1, with 38 .2 wks. of gestational age with full term normal delivery was admitted in AVBR Hospital with the complaint of pain in abdomen and increased the fetal movement on date 4/01/2020 and she delivered female baby on date 6/01/2020 and the baby weight was 2.8 kg at 1:40 am now her complaint was pain on suture side and weakness. Before pregnancy the patient menstrual cycle was regular 28 days of cycle and duration was 3-4 days.
and Last menstrual period was 11/04/2019 and Expected date of delivery was 16/01/2020.

Mrs. Nikita Matram has a previous history of abortion after marriage of four month & two and half month of baby was aborted. That time dilatation and curettage was done. She has not used any contraception method & no any medical history like DM, Hypertension, TB, Asthma. She lives in joint family in their family five member are living together including newborn and she was belonging from middle class family and in their houses all facilities are available like electricity, water supply from municipality etc. her monthly income was 25000/- per month. Mrs. Nikita and her family members were psychological stable. She maintains good interpersonal relationship with others. She is taking only vegetarian diet. She doesn’t have any allergic reaction from any food and no any history of any bad habits like chewing tobacco, smoking etc.

Patient general examination was state of health was unhealthy, conscious, Body built thin, Posture erect, hygiene was good. General parameter height was 154 cm, weight 45 kg. Vital sign is Temperature 98˚c, Pulse 84 b/m, Respiration – 20 b/m, BP – 120/80 mmHg. In breast some changes occur because of pregnancy enlargement of breast, nipple was large erectile and discharge was present of milk secretion. In abdomen linea nigra, striae gravidarum present. Lochia rubra was present.

**Investigations:**
- **CBC**
  - Hb 12.7 gm %
  - Total RBC 3.92 million/cu mm
  - Total WBC 13900 cu.mm
  - Total platelet counts 2.69 lacs/cu.mm
- **LFT**
  - SGPT 17
  - SGOT 31
  - Albumin 3.6 g/dl
- **USG**
  - Fetal no. – single
  - Lie – variable
  - Placenta – anterior, grade –II

Presentation – variable
Fetal movement – present
Liquor – adequate

Impression of USG – single intrauterine live fetus of average gestational age of 27 weeks 1 day and corresponding to weight of 999GMS.

The drugs are used Inj. Metrogyl 100cc, I.V., TDS.Action – Metronidazole injection is also to prevent infection when used before, during, and after colorectal surgery. Metronidazole injection is in a class of medications called antibacterial. It works by killing bacteria and protozoa that cause infection, Inj. C-Tax 1 gm, I.V., BD., Action - C Tax 1gm Injection is an antibiotic medicine used to treat bacterial infections in your body. It is effective in infections of the brain, lungs, ear, urinary tract, skin and soft tissues, bones and joints, blood and heart. It is also used to prevent infections during surgery, Inj. Oxytocin 10 IU.Oxytocin is a uterine stimulant, prescribed for the initiation of uterine contractions and induction of labor in women as well as stimulation of contractions in cases where the uterus does not contract enough during labor.

If any complication occurs during normal delivery than patient refer for lower segment Cesarian section. Mother should take care of self and self-care may include Rest and ambulance -early ambulation after delivery, hospital stay, diet, perineal care, care of bladder, care of bowel, sleep, care of breast, rooming in, aseptic and antiseptics, immunization post-partum exercise, follow up, daily observation and care of newborn. After normal delivery mother and baby should come for check up and follow up after discharge of six weeks, and explained the client about if any sign of infection and side effect of medication immediately informed to the doctors. Immunization of baby follow up is necessary.

**Discussion**

Present case reveals that the antenatal patient come in hospital with the complaint of pain in abdomen and increased the fetal movement on date 4/01/2020 and she delivered female baby on date 6/01/2020 and the baby weight was 2.8 kg at 1:40 am now her complaint was pain on suture side and weakness. After delivery mother and baby was normal Apgar score was ten and baby was kept with mother in same bed it will help to initiate breast feeding, thermoregulation, create bonding between mother and child, mother learn how to provide
the care to baby etc. after that pain was managed by painkiller. Condition of baby and mother was good.

Most broadly, the phrase ‘natural life’ in scientific research and healthcare policy refers to conception without and with minimal surgical intervention. The 2007 systematic review by both the prenatal care Planning Group, Making Natural Childbirth a Fact, provided for such a uniform approach of hospital birth to improve trust for auditors or tracking practice patterns. A subsequent description defined natural delivery or non-assisted vaginal delivery without intervention of labour; epidural, spinal and general anaesthesia or episiotomy. Unlike many other meanings, an interpretation with Werkmeister has been restricted to a pregnancy and birth and it does not apply to birth outcomes like vertical presentation as well as intact perineum.

This same delivering of a full-term baby originally referred with service only at gestational age of 37-42 weeks, even though defined by last menstruation cycle or through ultrasound dating as well as assessment. A Naegel rule is indeed a frequently used formula besides predicting a due date mostly on date from the last menstruation cycle. Its legislation states a 28-day menstruation periods as well as a mid-stage ovulation. Ultrasound dating will be much more accurate, especially because once implemented early in the pregnancy and used to substantiate or adjust a due date focused on last menstruation cycle. About 11 per cent of singleton birth is pre-term and 10 per cent of all births are post-term. As a result, nearly 80 per cent of babies are born on even a full-term basis, but only 3-5 per cent of births arise mostly on expected delivery date.

Healthcare offers patient care, encourages convenience, listens to emotional needs through a comprehensive wellbeing paradigm, and teaches nutrition or self-care. Even so, in today’s popular health care setting, postnatal nurses are very often responsible to devices or for mothers and babies. It is critical that organizations develop trust and expertise in order to make a transition towards a humanizing birth feasible. This topic problem in such a major nursing review offers important resources to help caregivers encourage, endorse and defend regular births. Nursing staff have a special and significant role to play in deciding the treatment procedures encountered by women. Unfortunately, nursing staff may well be functionally removed from important method of data interchange as well as from making a contribution to a treatment plan. This can influence the ability of nursing to successfully encourage, help or secure regular births. Since medicalized conception presents a threat of iatrogenic damage to the both mothers and infants, nurses have a duty obligation to encourage natural delivery in order to improve patient health. Studies on Prenatal diagnostic and treatment modalities were reviewed.

**Conclusion**

After delivery, mother and baby was normal. Apgar score was ten at birth. Condition of baby and mother was good after pain management pain was reduced.

**Ethical Clearance:** Taken from institutional ethics committee.

**Source of Funding:** Self.

**Conflict of Interest:** Nil.

**References**

Case Report on Obsessive-Compulsive Disorder

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Abstract

Introduction: Obsessive-compulsive disorder is an anxiety disorder in which people have recurrent, undesirable thoughts, ideas or sensations (obsessions) that make them feel compelled to go and do something (compulsion) repeatedly. Repetitive habits, such as washing hands, inspecting items or bathing, can substantially interfere with the everyday routines and social experiences of an individual.

Symptoms: Behavioral changes like hyperactivity, impulsivity, repetitive movement, perfectionism and social isolation. Mood changes like anxiety, anger and apprehension. Psychological changes like sleep disturbance, fear, repeatedly going over thoughts and narcissism.

Investigation: Hb% - 13 mg/dl; Glucose plasma random – 86 mg%; Serum Globulin– 3.2gm %; serum-Protein- 7gm %; HIV, HCV, HBsAg, VDRL, all of these tests were negative.

Surgical Management: Patient have no past surgical history.

Medical Management: Patient was treated with Ativan (Lorazepam) 3mg q6hr per oral and Therapies like Aversion therapy and Group Psychotherapy was also used.

Nursing Management: Assess for physical, psychological and social data. Aware for Impact of obsessions and compulsions on physical health, mood, self-esteem and natural capacity to cope. Remember that the defense mechanisms used, the nature or structure of the feeling, the suicidal risk, the capacity to work and the space accessible for social support services.

Conclusion: Patient was admitted to AVBRH and was diagnosed to have Obsessive-compulsive disorder. The got appropriate treatment and therapy and his condition has improved well.

Keywords: Obsessive-compulsive disorder, anxiety, compulsion, obsession, lorazepam, narcissism.

Introduction

Individuals with obsessive-compulsive personality disorder are very serious and Obsessive-compulsive personality disorder is very severe and formal, and has emotional difficulty. They are highly rigid, perfectionist, and keen on law. They are resistant to change about how tasks will be handled, and dedicate themselves to success to the exclusion of personal satisfaction. An extreme fear of making mistakes leads to a challenging decision-making process. The disease is relatively widespread and appears more often in men than in women. It appears to be most common in the oldest children within the family group.¹

The obsessive-compulsive disorder is, according to ICD9, a state in which “the outstanding symptom is a feeling of subjective compulsion which must be resisted - to carry out some action, to dwell on an idea, to recall an experience, or ruminate on an abstract topic. Unwanted thoughts, which include the insistency of words or ideas are perceived by the patient to be inappropriate or nonsensical. The obsessional urge or idea is recognized as alien to the personality, but as coming from within the
self. Obsessional rituals are designed to relieve anxiety, e.g. washing the hands to deal with contamination. Attempts to dispel the unwelcome thoughts or urges may lead to a severe inner struggle, with intense anxiety.

**Patient information:** A male patient 47 years from Halwadi, Wardha was admitted to Psychiatric Ward, AVBRH on 10th January 2020 with a case of Obsessive-compulsive disorder.

**Present Medical History:** My patient was apparently asymptomatic 2 years back when he was working in a private company while he was firing from his job due to his lack of responsibility according to his employer. Since then, he started maintaining self-disciplined and directing himself to his work with fear of losing the new job again. His behavior getting very excessive that leads to difficulty in coping with family and the society. He was brought to AVBRH by his wife on 10/01/2020, when he was diagnosed with Obsessive-compulsive disorder.

**Past Medical History:** My patient was apparently asymptomatic 2 years back when he was fired from his job due to lack of responsibility. He started devoting himself to his new job, maintaining new job self-disciplined that eventually leads to excessive behavior disorder like sleep disturbance, lack of interaction, perfectionist, difficulty in completing task due to perfectionism and strict standards, maintaining extreme hygiene of self and surroundings.

**Family History:** My patient belongs to a nuclear family, middle class living with his wife and two sons in their own house in Halwadi, Wardha. He is working as a clerk in a private school and is a breadwinner of the family. His two sons, one is 11th standard and the other is 9th grade. His wife has a small grocery store in their house.

**Clinical Findings:** Behavioral changes like hyperactivity, impulsivity, repetitive movement, perfectionism and social isolation. Mood changes like anxiety, anger and apprehension. Psychological changes like sleep disturbance, fear, repeatedly going over thoughts and narcissism.

**Predisposing Factors:** From a psychoanalytical point of view, one of overcontrol is the parental style in which the adult with obsessive-compulsive personality disorder was reared. Such parents want their children to live up to and reject their set standards of behaviour if they do not. Praise is bestowed on the child with far less frequency than punishment for unwanted behaviors. Individuals are specialists in this setting of knowing what they can not do to escape retribution and criticism, rather than what they should do to gain respect and praise. They learn to follow strict rules and regulations. Significant accomplishment are expected, taken for granted and acknowledged only occasionally by their parents, whose responses and decisions are restricted to pointing out transgressions and infringement of the rules.

**Pathophysiology:** Anxiety, obsessive-compulsive, most likely and associated disorder are caused by multiple factors. A graphic description of this multiple association hypothesis is provided in the Stress/Adaptation Transactional Model.

**Mental Status Examination:** A mental status examination was performed on my patient and it was found out that there was an impaired in the stream of thought and in the insight, the score was 2 i.e. the client denies of him having mental illness.

**Diagnostic Assessment:** Hb% - 13 mg/dl; Glucose plasma random – 86 mg%; Serum Globulin– 3.2gm %; serum-Protein - 7gm %; HIV, HCV, HBsAg, VDRL, all of these tests were negative.

**Therapeutic Intervention:** Tab Ativan (Lorazepam) 3mg PO x q6h. Therapies like Aversion therapy and Group Psychotherapy was also used.

**Discussion**

A male client of 47 years old from Halwadi was admitted to Psychiatric ward, AVBRH on 10th January 2020 with a complaint of strict personality and disciplined, which cause him to interact or cope with his family or society (according to the patient). According to the patient’s wife, the patient was an extreme self-disciplined, perfectionist, and he also wanted to change the bedsheet, clothes, shoes and blankets every day and he was very violent when they disobey him and this behavior had started in the past 2 years ago. He was diagnosed as Obsessive-compulsive disorder. As soon as he was admitted to hospital investigations were done and appropriate treatment were started. After getting treatment, he shows great improvement and the treatment was still going on till my last date of care.

A study was done on, “An epidemiological study and...”
severity assessment of obsessive-compulsive disorder in Warangal region, India”. The study aimed at to clinically assess the prevalence and assess the severity of obsessive-compulsive disorder (OCD) in Warangal region, India. A prospective observational study was done for a duration of 6 months i.e. from July-December 2013 at various Neuropsychiatric Centres in Warangal region. A total of 113 patients (male: 65, female: 48) were screened using specially designed data collection form to collect and record demographic data. Structured interviews were conducted to obtain Yale Brown Obsessive-Compulsive Scale (YBOCS) scores. All the data were analysed by ANOVA and Chi Square test using Statistical Package for Social Sciences (SPSS) software version by dividing the patients into age groups of decades from 11 to 60. It was found out This obsessive-compulsive disorder was more common in subjects between the ages of 21 and 30 (46%) and literate in patients (98.2%). More patients were married (61.6%) than single patients (38%). The most prevalent obsession was fear of harming (81.25%) while of the most prevalent compulsions was repeating (76.1%). Based on YBOCS scale, OCD severity was categorized into subclinical (2.7%), mild (23.9%), moderate (41.6%), severe (23%) and extreme (8.9%). The study concluded that the prevalence of OCD condition was more among the age group of 21 to 30 years and among literates. Sociodemographic factors like age, socioeconomic status and urban were risk factors in assessing the severity of OCD. Fewarticles related to various aspects of prevalent psychological problems and associated factors were reviewed 4-11. Ethical clearance-Taken from institutional ethics committee.

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Conflict of Interest: Nil.

References
Yash Scoring System in the Diagnosis of Acute Appendicitis

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Abstract

Background: Acute appendicitis is amongst the most encountered emergencies seen in casualties requiring intervention. The incidence of negative laparotomy is 15% to 25% and is associated with notable morbidity. Scoring systems are useful and logical for distinguishing acute appendicitis from non-specific abdominal pain. Presently many scoring systems exist that aids in the diagnosis of acute appendicitis but still fail to decrease the rates of wrong diagnosis and the negative appendicectomy rate. This study has been undertaken to evaluate the efficacy of the newer Yash scoring system which has been found more effective for the Indian population in diagnosing acute appendicitis.

Method and Material: A prospective study of the Yash scoring system was done on 50 patients. The decision of an appendicectomy was taken by the consultant surgeon. The outcomes of the Yash scoring system in terms of sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy were calculated.

Results: The Yash scoring system had sensitivity, specificity, PPV, NPV, and DA of 94.28%, 93.33%, 97.05%, 87.50%, and 94% respectively.

Conclusion: The Yash scoring system was a good tool to diagnose acute appendicitis.

Keywords: Negative appendicectomy, C-reative protein, Hyperaesthesia in sherrens triangle, Blumberg sign.

Introduction

Acute appendicitis is amongst the many encountered emergencies seen in casualties requiring intervention. There is a 6% chance of appendicitis in the general population[¹]. Though the mortality has declined from 26% to 1% with the dawn of broad-spectrum antibiotics and timely surgery, it remains 5 to 15% in the elderly[²]. The incidence of negative laparotomy is 15% to 25% and is associated with notable morbidity, the frequency being more in women of reproductive age group (till 45%) due to the commonness of inflammatory tubo-ovarian diseases, ectopic pregnancy, and other gynecological pathology[³]. The delay in diagnosis may lead to rupture of the appendix in 17% to 40% of cases mostly in extremes of age. In the adolescents and elderly, it is linked with dramatic complications like an intra-abdominal abscess, wound infection, and ultimately death[⁴]. Thus, confirmation of acute appendicitis is very crucial to achieve lower morbidity and mortality rates.

The regular laboratory investigations of blood and urine are necessary. Leukocytosis is a convenient finding but is non-specific and may be missing in the elderly[⁵] C – Reactive protein is elevated in almost all acute inflammatory conditions, hence is considered as a non-specific marker but its estimation guides a surgeon in reducing negative appendicectomies[⁶,⁷].

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Magnetic resonance imaging (MRI) as an investigation is only taken typically in the pregnant population where radiation exposure is not warranted. It provides outstanding resolution and is highly efficient in diagnosing acute appendicitis. MRI has high sensitivity and specificity of 100% and 98% respectively. The PPV and NPV of MRI are 98% and 100% respectively. It is also operator-independent. The only issue is its higher cost, motion artifact, and complexity in reading MRI by non-radiologists with limited experience [6].

Despite the use of all these imaging techniques, the incidence of negative appendicectomy is not decreasing. These unmerited operations have a complication rate of approximately 13%, which is nearly to that of an inflamed appendix. Removal of a healthy appendix has a mortality of 0.65%. Protracted clinical observations aiming to reduce undesired operations may mean a delay in operations in 28% of cases and considerable danger of perforation[7,8,9].

Scoring systems are useful and logical for distinguishing pain of acutely inflamed appendix from vague abdominal pain. Presently numerous scoring systems exist that aid in diagnosing acute appendicitis. However, these systems do not replace clinical acumen thereby just helping in the determination of acute appendicitis and aids in approaching a conclusion, whether a particular case should be operated or not, thus lowering the negative appendicectomy rate (NAR)[10,11].

The study done by Lamture YR et al[12] in India on the Yash scoring system reveals a sensitivity of 99.48%, a specificity of 92.86%, PPV of 99.48%, and NPV of 92.86%. Though the validity of the Yash scoring system is promising for the Indian population, its only disadvantage was in the mode of a single study.

Despite various scoring systems and developments in the diagnostic and imaging modalities, the diagnosis of appendicitis is in dilemma which fails to decrease the rates of wrong diagnosis and the negative appendicectomy rate. This sequentially increases the cost for diagnosis by the use of expensive radiological modalities like Computed Tomography and MRI thus causing a delay in the treatment leading to an increase in morbidity and mortality of the patients[13].

This non-randomized prospective study has been undertaken to evaluate the effectiveness of the newer Yash score which has been found more effective for the Indian population in diagnosing acute appendicitis.

Method

The present study was undertaken in the department of surgery, Jawaharlal Nehru Medical College, Wardha in collaboration with Datta Meghe Medical College Hingana, Nagpur, Datta Meghe Institute of medical science (DMIMS), Sawangi, Meghe, Wardha, Maharashtra India.

Study Design: Prospective non-randomized study.

Study Population: All patients of acute appendicitis with age >15 years and <60 years.

Study Duration: July 2018-July 2020.

Sample Size: 50 Patients

Inclusion Criteria: All patients with right lower quadrant pain and clinically diagnosed as acute appendicitis of age >15 years and <60 years.

Exclusion Criteria:
1. Patients with appendicular mass.
2. Patients of appendicitis with a known case of connective tissue disorder.
3. Patients with a past history of renal or ureteric stones and pelvic inflammatory disease.
4. Pregnant women.

Ethical clearance was obtained from the Ethics committee of Datta Meghe Institute of Medical Sciences (Deemed to be University) [Ref. No. DMIMS(DU)/IEC/2018-19/7426]. This prospective non-randomized study was conducted in Acharya Vinoba Bhave Rural Hospital, Sawangi. All the patients who fulfilled the eligibility criteria were subjected to routine hematological investigations, C-reactive protein, USG, and were scored based on the Yash scoring system.

The components of the Yash scoring system are as follows:
• Migration of pain to the right iliac fossa = 1 point
• Nausea and vomiting = 1 point
• Anorexia = 1 point
• Right iliac fossa tenderness = 2 points
• Rebound tenderness = 1 point
• Hyperesthesia in Sherren’s triangle = 1 point
• Fever = 1 point
- White blood cell count > 10,000 mg/dl = 2 points
- C-reactive protein (> 15mg/dl) = 3 points
- Ultrasonography = 4 points

A score of 7 or more is suggestive of acute appendicitis requiring surgery\(^{[12]}\).

The decision to operate was taken by a consultant surgeon by clinical diagnosis with help of other appropriate investigations in special circumstances. All patients underwent appendicectomy with prior consent and the specimen was subjected to histopathological examination for confirmation of diagnosis. The minimum criteria for acute appendicitis were the appearance of neutrophils in mucosa, submucosa, and lamina propria\(^{[1]}\).

The result of the Tzanakis score and Yash score was reported independently. The result was correlated with the findings obtained on histopathological examination and the data was analyzed using the necessary statistical calculations using SPSS 24.0 version, the results were then presented.

**Observations and Results**

Graph No. 01: Gender distribution

Graph 02: Characteristics of Yash score
Graph 03: Outcome of YASH scoring system

Graph 04: Negative Appendectomy rate of Yash scoring system:
Acute appendicitis continues to exist as the most widespread emergency in the world. A delay in making a diagnosis is associated with various complications which increases the morbidity and mortality in patients therefore a prompt and reliable diagnosis of acute appendicitis is mandatory. Further more, negative appendicectomy also accounts for the loss of financial resources and is associated with morbidity in 10 to 15% of cases.

Despite big breakthroughs in the imaging field, there remains uncertainty in diagnosing acute appendicitis due to atypical presentations of the disease. It has been repeatedly shown that investigations like USG lack specificity due to its operator dependency whereas investigations like CT scan and MRI are highly-priced demanding more advanced equipment and competency. This makes a detailed clinical examination with primary investigations such as leucocyte count as the backbone in diagnosing acute appendicitis. This has compelled many surgeons to use diverse scoring systems for diagnosing acute appendicitis. The clinical evaluation is reliable in 50% to 80% of cases. The evaluation is more complex in the extremes of age and women of reproductive age group due to atypical presentations.

The current study will deal with the evaluation of the Yash scoring system to diagnose acute appendicitis in a simple, reliable, and cost-effective way thereby reducing the negative appendectomy rate and thus morbidity associated with it.

In this study, the sample population consisted of 50 patients out of which 58% were males and 42% were females (see graph 01).

All the patients who accomplished the eligibility criteria were subjected to detailed clinical examination, routine hematological investigations, C-reactive protein, USG and were scored based on the Yash scoring system. The decision to operate the patient including patients with scores less than the cut-off value was based on the clinical assessment and judgment taken by the consultant surgeon. All the patients underwent appendectomy with prior consent and the specimen was subjected to histopathological examination to confirm the diagnosis.

In our study, 82% of the patients were operated by open method whereas 18% of patients were operated by laparoscopy. The study done by Malla BR et al[14] consisted of 200 patients in which 128 patients (64%) underwent appendectomy by an open method and 72 patients (36%) underwent appendectomy by laparoscopy.
The most common incision used in open appendectomy was Mc Burney’s in about 83% of cases followed by the right Para median which was used in 17% of cases. Similarly, in the study done by Lamture YR et al[12] the most common incision used was Mc Burney’s in 94.74% of patients followed by right Para median in 5.26% of cases. In our present study, 35 out of 50 patients (70%) had inflamed appendix intra-operatively. Out of the remaining 15 patients, five patients had enterocolitis, three patients had Meckel’s diverticulitis, three patients had the pelvic inflammatory disease (salpingitis), two patients had a ruptured ovarian cyst and two patients had inflamed mesenteric lymph node (with or without pus) as the intra-operative findings. Shashikala V et al[9] in her study had five out of 50 patients with the alternative diagnosis; out of which one patient had enterocolitis and four patients had the pelvic inflammatory disease.

Another study was done by Kumar SLA et al[13] his study also reported six patients with alternative diagnoses in which three patients had salpingitis, two patients had an ovarian cyst and one patient had Meckel’s diverticulitis.

The new Yash score described by Lamture YR et al[12] in 2017 has a significant role in identifying acute appendicitis. It differs from earlier scoring systems by including various parameters such as C-reactive protein, leukocyte counts, USG, and clinical data. A score of seven or more in patients was considered as acute appendicitis and such patients were subjected to operative intervention.

In our study, out of ten parameters, tenderness in the right iliac fossa was the commonest sign seen in 100% of patients. The other two signs i.e. rebound tenderness and hyperesthesia in Sherren’s triangle was seen in 82% and 26% of patients respectively. The most common symptom was fever which was present in 88% of cases followed by nausea or vomiting which was found in 86% of the cases. Anorexia was seen in 72% of patients, whereas 68% of patients gave a history of migratory right iliac fossa pain. Out of the three investigations included in the scoring system, leucocytosis defined as WBC count more than 10000/mm$^3$ was present in 80% of cases. C-reactive protein with a value of more than 15mg/dl was present in 28% of cases with USG showing features of appendicitis in only 46% of cases (see graph 02).

In the present study, 34 patients had a score of seven or more, and 16 patients who had a score of less than seven according to the Yash score. Out of the 34 patients who scored seven or more, there were 33 patients with features of appendicitis on histopathological examination whereas only one patient had a histologically normal appendix with no features of inflammation. Similarly, out of 16 patients who scored less than seven, there were 14 patients with a histologically normal appendix with no features of inflammation and only two patients with features of appendicitis on histopathology.

The sensitivity and specificity of the Yash scoring system in the present study were found to be 94.28% and 93.33% respectively. It had PPV and NPV of 97.05% and 88.50% respectively. The overall diagnostic accuracy of the Yash scoring system in our study was found to be 94% (see graph 03). The following results are comparable to the single original study done by Lamture YR et al in which the sensitivity, specificity, PPV, and NPV was 99.48%, 92.86%, 99.48%, and 92.85% respectively. The diagnostic accuracy of the Yash score reported by Lamture YR et al was 98.56%.

The negative appendicectomy rate (NAR) of the Yash scoring system in the present study was found to be zero percent in males and 4.76% in females. This discrepancy in NAR was due to the high probability of another possible diagnosis in females of reproductive age group such as pelvic inflammatory diseases and ovarian cyst. The overall NAR observed for the Yash scoring system was 2% (see graph 04) which is way lower than the accepted rate of 15 to 25%. In the study done by Lamture YR et al[12], the NAR was found to be 6.69% which is comparable to our study[14].

The negative appendicectomy rate of the Yash scoring system was dramatically lower than other studies and the diagnostic accuracy of this scoring system is better when compared with other studies (see graph no 5).

**Conclusion**

The study also shows that the Yash scoring system is a better tool to avoid unnecessary operations due to its exceptionally low negative appendicectomy rate thus lowering morbidity in patients of acute appendicitis and thereby lowering the cost of treatment and prevention of misuse of valuable resources and manpower.

**Ethical Clearance:** Taken from institutional ethics committee.

**Source of Funding:** Self.

**Conflict of Interest:** Nil.


Tzanakis Scoring System in Acute Appendicitis Concern to Indian Population

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Abstract

Background: Acute appendicitis is amongst the most encountered emergencies seen in casualties requiring intervention. The incidence of negative laparotomy is 15% to 25% and is associated with notable morbidity. Scoring systems are useful and logical for distinguishing acute appendicitis from non-specific abdominal pain. Presently many scoring systems exist that aids in the diagnosis of acute appendicitis but still fail to decrease the rates of wrong diagnosis and the negative appendicectomy rate. This study has been undertaken to evaluate the efficacy of the Tzanakis scoring system for the Indian population in diagnosing acute appendicitis.

Method and Material: A prospective study to evaluate Tzanakis scoring system on 50 patients. The decision of an appendicectomy was taken by the consultant surgeon. The outcomes of the Tzanakis scoring system in terms of sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy were calculated.

Results: The Tzanakis scoring system had sensitivity, specificity, PPV, NPV, and DA of 71.42%, 66.67%, 83.33%, 50%, and 70% respectively.

Conclusion: Tzanakis scoring system in diagnosing acute appendicitis has a lower value in Indian populations.

Keywords: Inflammation of the appendix, gangrene of appendix, perforation peritonitis.

Introduction

Acute appendicitis is amongst the many encountered emergencies seen in casualties requiring intervention. There is a 6% chance of appendicitis in the general population[¹]. Though the mortality has declined from 26% to 1% with the dawn of broad-spectrum antibiotics and timely surgery, it remains 5 to 15% in the elderly[²].

The incidence of negative laparotomy is 15% to 25% and is associated with notable morbidity, the frequency being more in women of reproductive age group (till 45%) due to the commonness of inflammatory tubo-ovarian diseases, ectopic pregnancy, and other gynecological pathology[³]. The delay in diagnosis may lead to rupture of the appendix in 17% to 40% of cases mostly in extremes of age. In the adolescents and elderly, it is linked with dramatic complications like an intra-abdominal abscess, wound infection, and ultimately death [⁴]. Thus, confirmation of acute appendicitis is very crucial to achieve lower morbidity and mortality rates.

Ultrasonography (USG) with graded compressions has immense capacity in diagnosing appendicitis in its acute stage[⁵]. Various studies have been conducted on
the utilization of these imaging systems. These studies reported a sensitivity of 75% to 94%, a specificity of 86% to 100%, and gross precision up to 96%\cite{6}. Its superiority over computed tomography is the absence of exposure to ionizing radiation thus helpful in pregnant and pediatric patients. The major disadvantage is that it is operator dependent leading to inter-observer bias and failure to see the appendix during the scan does not rule out the possibility of having an inflamed appendix\cite{5}.

Despite the use of all these imaging techniques, the incidence of negative appendicectomy is not decreasing. These unmerited operations have a complication rate of approximately 13%, which is nearby to that of an inflamed appendix. Removal of a healthy appendix has a mortality of 0.65%. Protracted clinical observations aiming to reduce undesired operations may mean a delay in operations in 28% of cases and considerable danger of perforation\cite{7}.

Scoring systems are useful and logical for distinguishing pain of acutely inflamed appendix from vague abdominal pain. Presently numerous scoring systems exist that aid in diagnosing acute appendicitis. However, these systems do not replace clinical acumen thereby just helping in the determination of acute appendicitis and aids in approaching a conclusion, whether a particular case should be operated or not, thus lowering the negative appendicectomy rate (NAR).

The original study done by Tzanakis et al\cite{8} in Greece reported sensitivity and specificity of 95.4% and 97.4% respectively. The diagnostic effectiveness of the score was 96.5% in his study. But in India, this scoring system was found inferior. For example, a comparative study between Tzanakis score and Alvarado score done by Shashikala V\cite{9} in India revealed that Tzanakis scoring system had a sensitivity of 79.62%, a specificity of 83.3%, PPV of 97.72%, and NPV of 31.25% which was found better than Alvarado scoring system but still posing difficulties in diagnosis with a NAR of 12%. Another study was done by Iqbal MM et al\cite{10} in Postgraduate medical center, Karachi, Pakistan revealed that the Tzanakis score had a sensitivity of 99%, the specificity of 91%, PPV of 99%, and NPV of 91% with a diagnostic accuracy of 95%. Similarly, A study done in Kathmandu Model Hospital, Nepal did by Sigdel GS et al\cite{11} reveals that Tzanakis has a sensitivity of 91.48%, a specificity of 66.66%, and diagnostic accuracy of 90%.

Despite various scoring systems and developments in the diagnostic and imaging modalities, the diagnosis of appendicitis is in dilemma which fails to decrease the rates of wrong diagnosis and the negative appendicectomy rate. This sequentially increases the cost for diagnosis by the use of expensive radiological modalities like Computed Tomography and MRI thus causing a delay in the treatment leading to an increase in morbidity and mortality of the patients.

This non-randomized prospective study has been undertaken to evaluate the effectiveness of the Tzanakis score in diagnosing acute appendicitis.

**Method**

The present study was undertaken in the department of surgery, Jawaharlal Nehru Medical College, Wardha in collaboration with Datta Meghe Medical College Hingana, Nagpur, Datta Meghe Institute of Medical science (DMIMS), Sawangi, Meghe, Wardha, Maharashtra India.

**Study Design:** Prospective non-randomized study.

**Study Population:** All patients of acute appendicitis with age >15 years and <60 years.

**Study Duration:** July 2019-July 2020.

**Sample Size:** 50 patients

**Inclusion Criteria:**

1. Patients with appendicular mass.
2. Patients of appendicitis with a known case of connective tissue disorder.
3. Patients with a past history of renal or ureteric stones and pelvic inflammatory disease.
4. Pregnant women.

**Exclusion Criteria:**

1. Patients with appendicular mass.
2. Patients of appendicitis with a known case of connective tissue disorder.
3. Patients with a past history of renal or ureteric stones and pelvic inflammatory disease.
4. Pregnant women.

Ethical clearance was obtained from the Ethics committee of DattaMeghe Institute of Medical Sciences (Deemed to be University).This prospective non-randomized study was conducted in Acharya VinobaBhave Rural Hospital, Sawangi. All the patients who fulfilled the eligibility criteria were subjected to routine hematological investigations, USG, and were scored based on Tzanakis scoring system.
Tzanakis scoring system combines 4 variables as follows:

- Presence of right lower abdominal tenderness = 4 points
- Rebound tenderness (Bloomberg sign) = 3 points
- Laboratory findings: the presence of white blood cells greater than 12,000 in the blood = 2 points
- Ultrasound findings: the presence of positive ultrasound scan findings = 6 points

A score of 8 or more is suggestive of acute appendicitis requiring surgery[8].

The decision to operate was taken by a consultant surgeon by clinical diagnosis with help of other appropriate investigations in special circumstances. All patients underwent appendicectomy with prior consent and the specimen was subjected to histopathological examination for confirmation of diagnosis. The minimum criteria for acute appendicitis were the appearance of neutrophils in mucosa, submucosa, and lamina propria[1]. The result of the Tzanakis score was calculated. The result was correlated with the findings obtained on histopathological examination and the data was analyzed using the necessary statistical calculations using SPSS 24.0 version, the results were then presented.

**Observations and Results:**

Graph No. 01: Gender

Graph 02: Individual characteristics of Tzanakis score:
Graph 03: outcome of Tzanakis Scoring system

Graph 04: Negative appendicectomy rate of Tzanakis scoring system:
Acute appendicitis continues to exist as the most widespread emergency in the world. A delay in making a diagnosis is associated with various complications which increases the morbidity and mortality in patients therefore a prompt and reliable diagnosis of acute appendicitis is mandatory. Furthermore, negative appendicectomy also accounts for the loss of financial resources and is associated with morbidity in 10 to 15% of cases.

Despite big breakthroughs in the imaging field, there remains uncertainty in diagnosing acute appendicitis due to atypical presentations of the disease. It has been repeatedly shown that investigations like USG lack specificity due to its operator dependency whereas investigations like CT scan and MRI are highly-priced demand more advanced equipment and competency. This makes a detailed clinical examination with primary investigations such as leucocyte count as the backbone in diagnosing acute appendicitis. This has compelled many surgeons to use diverse scoring systems for diagnosing acute appendicitis. The clinical evaluation is reliable in 50% to 80% of cases. The evaluation is more complex in the extremes of age and women of reproductive age group due to atypical presentations[12,13].

The current study will deal with the evaluation of the Tzanakis scoring system to diagnose acute appendicitis in a simple, reliable, and cost-effective way thereby reducing the negative appendectomy rate and thus morbidity associated with it.

In this study, the sample population consisted of 50 patients out of which 58% were males and 42% were females (see graph 01). The male to female ratio in our study was found to be 1.4:1 which is comparable to the study done by Kumar SLA et al[14] in which the male to female ratio was 1.6:1.

All the patients who accomplished the eligibility criteria were subjected to detailed clinical examination, routine hematological investigations, USG, and were scored based on the Tzanakis scoring system. The decision to operate the patient including patients with a score less than the cut-off value was based on the clinical assessment and judgment taken by the consultant surgeon. All the patients underwent appendectomy with prior consent and the specimen was subjected to histopathological examination to confirm the diagnosis.

In our present study, 35 out of 50 patients (70%) had inflamed appendix intra-operatively. Out of the remaining 15 patients, five patients had enterocolitis,
three patients had Meckel’s diverticulitis, three patients had the pelvic inflammatory disease (salpingitis), two patients had a ruptured ovarian cyst and two patients had inflamed mesenteric lymph node (with or without pus) as the intra-operative findings. Shashikala V et al[9] in her study had five out of 50 patients with an alternative diagnoses; out of which one patient had enterocolitis and four patients had a pelvic inflammatory disease. Another study was done by Kumar SLA et al[14] his study also reported six patients with alternative diagnoses in which three patients had salpingitis, two patients had an ovarian cyst and one patient had Meckel’s diverticulitis.

Tzanakis et al[8], in 2005 revealed a more comprehensible system to help in making the diagnosis of appendicitis. It includes four parameters comprising of specific signs, laboratory and radiological investigations such as right iliac fossa tenderness, rebound tenderness over the right iliac fossa, leucocytosis (WBC count>12,000/mm$^3$), and USG. A score of 8 or more is considered as acute appendicitis.

In our study, out of the four parameters present in the scoring system, tenderness in the right iliac fossa was the commonest sign seen in 100% of patients whereas rebound tenderness and leucocytosis was found in 82% and 68% of the patients respectively. USG showed features of appendicitis in only 46% of cases (see graph 02).

In the present study, 30 patients had a score of eight or more, and 20 patients who had a score of less than eight according to the Tzanakis score.

The 30 patients who scored eight or more had 25 patients with features of appendicitis on histopathology whereas 5 patients had a histologically normal appendix with no features of inflammation.

Similarly, 20 patients scored less than eight out of which there were 10 patients with a histologically normal appendix with no features of inflammation and 10 patients with features of appendicitis on histopathology.

The sensitivity, specificity, PPV, NPV, and diagnostic accuracy of the Tzanakis scoring system in our study was found to be 71.42%, 66.67%, 83.33%, 50.00%, and 70% respectively (see graph 03). The low sensitivity and specificity rate was due to the presence of high false-negative and false-positive results.

The study done by Tzanakis et al[8] in 2005 had a sensitivity of 95.4%, the specificity of 97.4%, PPV of 96.5%, NPV of 96.5%, and diagnostic accuracy of 96.5% which is much higher as compared to our present study. This difference may occur due to low sample size, ethnic variation, and other demographic factors such as diet (see graph 5).

The study done by Shashikala V et al[9] in 2016 reported a sensitivity of 79.62%, a specificity of 83.3%, PPV of 97.72%, and NPV of 31.25% which were comparable to our present study. The study done by Iqbal MM et al[10] in 2018 had results similar to that of Tzanakis et al[8] with a sensitivity of 99%, a specificity of 91%, PPV of 99%, NPV of 91%, and diagnostic accuracy of 95% (see graph 5).

The study was done by Sigdel GS et al[11] and Kumar SLA et al[14] in 2017 had a specificity of 66.66% and 71.43% respectively which was comparable to our study whereas the NPV of both the studies was lower than our present study. Both studies had a sensitivity and PPV higher than our present study but the difference is not significant (see graph 5).

Similarly, the study done by BR Malla et al[15] in 2014 had sensitivity, specificity, PPV, and NPV of 86.9%, 75%, 97.5%, and 33.3% respectively. The outcome of the Tzanakis scoring system in the study conducted by Malla BR et al was comparable to our present study (see graph 5).

The negative appendicectomy rate (NAR) of the Tzanakis scoring system in the present study was found to be 10.34% percent in the males and 9.52% in females. The overall NAR observed for the Tzanakis scoring system was 10% (see graph no 04).

The negative appendicectomy rate in our present study for the Tzanakis Scoring system was comparable to NAR obtained in the studies done by Shashikala V et al[9](12%) and Iqbal MM et al[10] (10.30%).

The disadvantage of the Tzanakis scoring system is that it does not include more clinical symptoms such as fever, nausea and vomiting, anorexia, migratory right iliac fossa pain, and supportive investigations such as CRP which augments the accuracy of the scoring system. Another factor for the low specificity of the Tzanakis score is that it gives the highest weightage to ultrasonography in its scoring system which has variable sensitivity and specificity due to inter-observer bias.
Conclusion

• Similarly, the Tzanakis scoring system had sensitivity, specificity, PPV, NPV, and DA 71.42%, 66.67%, 83.33%, 50.00%, and 70% respectively.

• The overall negative appendicectomy rate of the Tzanakis scoring system was 10%.

Ethical Clearance: Taken from institutional ethics committee.

Source of Funding: Self.

Conflict of Interest: Nil.

References

Comparison Between the Tzanakis Scoring System and Yash Scoring System in the Diagnosis of Acute Appendicitis

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Abstract

Background: Acute appendicitis is amongst the most encountered emergencies seen in casualties requiring intervention. The incidence of negative laparotomy is 15% to 25% and is associated with notable morbidity. Scoring systems are useful and logical for distinguishing acute appendicitis from non-specific abdominal pain. Presently many scoring systems exist that aids in the diagnosis of acute appendicitis but still fail to decrease the rates of wrong diagnosis and the negative appendicectomy rate. This comparative study has been undertaken to evaluate and compare the efficacy of the Tzanakis scoring system with the relatively newer Yash scoring system which has been found more effective for the Indian population in diagnosing acute appendicitis.

Aim: To compare the efficacy of the Yash scoring system with the Tzanakis scoring system in diagnosing acute appendicitis.

Method and Material: A prospective comparison of the Tzanakis scoring system and Yash scoring system was done on 50 patients. The decision of an appendicectomy was taken by the consultant surgeon. The outcomes of the Tzanakis scoring system and Yash scoring system in terms of sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy were calculated and compared.

Results: The Yash scoring system had sensitivity, specificity, PPV, NPV, and DA of 94.28%, 93.33%, 97.05%, 87.50%, and 94% respectively. The Tzanakis scoring system had sensitivity, specificity, PPV, NPV, and DA of 71.42%, 66.67%, 83.33%, 50%, and 70% respectively.

Conclusion: The Yash scoring system was significantly better than the Tzanakis scoring system in diagnosing acute appendicitis.

Keywords: Appendix, laparotomy, score, diagnosis, inflammation.

Introduction

Acute appendicitis is amongst the many encountered emergencies seen in casualties requiring intervention. There is a 6% chance of appendicitis in the general population[1]. Though the mortality has declined from 26% to 1% with the dawn of broad-spectrum antibiotics and timely surgery, it remains 5 to 15% in the elderly [2]. The incidence of negative laparotomy is 15% to 25% and is associated with notable morbidity, the frequency being more in women of reproductive age group (till 45%) due to the commonness of inflammatorytubo-ovarian diseases, ectopic pregnancy, and other gynecological pathology[3]. The delay in diagnosis may lead to rupture of the appendix in 17% to 40% of cases mostly in extremes of age. In the adolescents and elderly,
it is linked with dramatic complications like an intra-abdominal abscess, wound infection, and ultimately death [4]. Thus, confirmation of acute appendicitis is very crucial to achieve lower morbidity and mortality rates.

Conventional history and clinical examination continue to exist as the potent and actual diagnostic modalities in pinpointing acute appendicitis[5]. The chronology is the commencement of periumbilical pain shifting to the right iliac fossa with subsequent development of anorexia and nausea or vomiting. The clinical examination may disclose signs resembling peritonitis such as local rebound tenderness (Blumberg’s sign), guarding, rigidity, cutaneous hyperesthesia, and tenderness on rectal examination. Thirty-three percent of all cases with inflamed appendix present with unusual symptoms such as blunting of pain by the presence of overlying bowel in cases of retrocecal or retro iliac position of the appendix, increased urinary frequency, and tenesmus. Several conditions mimic appendicitis such as enterocolitis, terminal ileitis, pelvic inflammatory diseases, ureteric colic, peptic ulcer, diverticulitis, etc, and hence should be considered in the list of differential diagnosis[6].

The regular laboratory investigations of blood and urine are necessary. Leukocytosis is a convenient finding but is non-specific and may be missing in the elderly [2]. C–Reactive protein is elevated in almost all acute inflammatory conditions, hence is considered as a non-specific marker but its estimation guides a surgeon in reducing negative appendicectomies[7].

Plain x rays have validity in diagnosing appendicitis in only 8% of cases showing non-specific findings with low sensitivity and specificity [8]. The reliability of barium enema examination is 50% to 84%, but it has a major complication of caecal perforation when done in acute inflammatory conditions [9]. Computed tomography (CT) is another imaging modality used to confirm appendicitis and is exceedingly efficacious and precise. It is operator independent and has shown a sensitivity of 90% to 100% and specificity of 91% to 99%. CT has a positive predictive value (PPV) of 92% to 98% and a negative predictive value (NPV) of 95% to 100%[10].

Ultrasonography (USG) with graded compressions has immense capacity in diagnosing appendicitis in its acute stage[10]. Various studies have been conducted on the utilization of these imaging systems. These studies reported sensitivity of 75% to 94%, a specificity of 86% to 100% and gross precision up to 96%[10,11]. Its superiority over computed tomography is the absence of exposure to ionizing radiation thus helpful in pregnant and paediatric patients. The major disadvantage is that it is operator dependent leading to inter-observer bias and failure to see the appendix during the scan does not rule out the possibility of having an inflamed appendix[10].

Magnetic resonance imaging (MRI) as an investigation is only taken typically in the pregnant population where radiation exposure is not warranted. It provides outstanding resolution and is highly efficient in diagnosing acute appendicitis. MRI has high sensitivity and specificity of 100% and 98% respectively. The PPV and NPV of MRI are 98% and 100% respectively. It is also operator-independent. The only issue is its higher cost, motion artifact, and complexity in reading MRI by non-radiologists with limited experience [11].

Despite the use of all these imaging techniques, the incidence of negative appendicectomy is not decreasing. These unmerited operations have a complication rate of approximately 13%, which is nearby to that of an inflamed appendix. Removal of a healthy appendix has a mortality of 0.65%. Protracted clinical observations aiming to reduce undesired operations may mean a delay in operations in 28% of cases and considerable danger of perforation [12].

Scoring systems are useful and logical for distinguishing pain of acutely inflamed appendix from vague abdominal pain. Presently numerous scoring systems exist that aid in diagnosing acute appendicitis. However, these systems do not replace clinical acumen thereby just helping in the determination of acute appendicitis and aids in approaching a conclusion, whether a particular case should be operated or not, thus lowering the negative appendicectomy rate (NAR).

The original study done by Tzanakis et al [13] in Greece reported sensitivity and specificity of 95.4% and 97.4% respectively. The diagnostic effectiveness of the score was 96.5% in his study. But in India, this scoring system was found inferior. For example, a comparative study between Tzanakis score and Alvarado score done by Shashikala V[14] in India revealed that Tzanakis scoring system had a sensitivity of 79.62%, a specificity of 83.3%, PPV of 97.72%, and NPV of 31.25% which was found better than Alvarado scoring system but still posing difficulties in diagnosis with a NAR of 12%. Another study was done by Iqbal MM et al[15] in
Postgraduate medical center, Karachi, Pakistan revealed that the Tzanakis score had a sensitivity of 99%, a specificity of 91%, PPV of 99%, and NPV of 91% with a diagnostic accuracy of 95%. Similarly, a study done in Kathmandu Model Hospital, Nepal did by Sigdel GS et al. [16] reveals that Tzanakis has a sensitivity of 91.48%, a specificity of 66.66%, and diagnostic accuracy of 90%.

The study done by Lamture YR et al. [17] in India on the Yash scoring system reveals a sensitivity of 99.48%, a specificity of 92.86%, PPV of 99.48%, and NPV of 92.86%. Though the validity of the Yash scoring system is promising for the Indian population, its only disadvantage was in the mode of a single study.

Despite various scoring systems and developments in the diagnostic and imaging modalities, the diagnosis of appendicitis is in dilemma which fails to decrease the rates of wrong diagnosis and the negative appendicectomy rate. This sequentially increases the cost for diagnosis by the use of expensive radiological modalities like Computed Tomography and MRI thus causing a delay in the treatment leading to an increase in morbidity and mortality of the patients.

This comparative non-randomized prospective study has been undertaken to evaluate and compare the effectiveness of the Tzanakis score with the relatively newer Yash score which has been found more effective for the Indian population in diagnosing acute appendicitis.

**Method**

The present study was undertaken in the department of surgery, Jawaharlal Nehru Medical College, Wardha in collaboration with Datta Meghe Medical College Hingana, Nagpur, Datta Meghe Institute of medical science (DMIMS), Sawangi, Meghe, Wardha, Maharashtra India.

**Aim:** To compare the efficacy of the Yash scoring system with the Tzanakis scoring system in the diagnosis of acute appendicitis.

**Objectives:**

1. To study the outcome of the Yash scoring system regarding its sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy.
2. To study the outcome of the Tzanakis scoring system about its sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy.
3. To compare the outcome of Yash and Tzanakis scoring system.

**Study Design:** Prospective non-randomized study.

**Study Population:** All patients of acute appendicitis with age >15 years and <60 years.

**Study Duration:** July 2018-July 2020.

**Sample size:** 50 patients

- The sample size was calculated by the modified Fischer’s formula. The prevalence rate of appendicitis was taken as 6% from the study done by Yogesh Pralhad Chaudhari, Prasanna Gambhir Jawale [18] in 2015.

- Where \(N \geq \frac{Z_{1-\alpha/2}^2 \times P \times (1-P)}{d^2}\)

- \(Z_{1-\alpha/2} = \) is standard normal variate (at 5% type 1 error \((P<0.05)\) it is 1.96 and at 1% type 1 error \((P<0.01)\) it is 2.58). In most of the studies, \(P\) values below 0.05 are considered significant. Therefore, value of 1.96 is employed in formula.

- \(p = \) prevalence of appendicitis in community anticipated on the basis of past studies.

- \(d = \) Absolute error or precision – decided by researcher.

- \(p = 6\%

- \(d = 0.07 (7\% \text{ error of margin})\).

The minimum sample size would be 44.12 patients, thus 50 patients included in the study.

**Inclusion Criteria:** All patients with right lower quadrant pain and clinically diagnosed as acute appendicitis of age >15 years and <60 years.

**Exclusion Criteria:**

1. Patients with appendicular mass.
2. Patients of appendicitis with a known case of connective tissue disorder.
3. Patients with a past history of renal or ureteric stones and pelvic inflammatory disease.
4. Pregnant women.

Ethical clearance was obtained from the Ethics committee of Datta Meghe Institute of Medical Sciences.
This prospective non-randomized study was conducted in Acharya Vinoba Bhave Rural Hospital, Sawangi. All the patients who fulfilled the eligibility criteria were subjected to routine hematological investigations, C-reactive protein, USG, and were scored based on Yash and Tzanakis scoring system.

Tzanakis scoring system combines 4 variables as follows:

- Presence of right lower abdominal tenderness = 4 points
- Rebound tenderness (Bloomberg sign) = 3 points
- Laboratory findings: the presence of white blood cells greater than 12,000 in the blood = 2 points
- Ultrasound findings: the presence of positive ultrasound scan findings = 6 points

A score of 8 or more is suggestive of acute appendicitis requiring surgery.[13] Similarly, the components of the Yash scoring system are as follows:

- Migration of pain to the right iliac fossa = 1 point
- Nausea and vomiting = 1 point
- Right iliac fossa tenderness = 2 points
- Rebound tenderness = 1 point
- Hyperesthesia in Sherren’s triangle = 1 point
- Fever = 1 point
- White blood cell count > 10,000 mg/dl = 2 points
- C-reactive protein (> 15 mg/dl) = 3 points
- Ultrasonography = 4 points

A score of 7 or more is suggestive of acute appendicitis requiring surgery.[17]

The decision to operate was taken by a consultant surgeon by clinical diagnosis with help of other appropriate investigations in special circumstances. All patients underwent appendicectomy with prior consent and the specimen was subjected to histopathological examination for confirmation of diagnosis. The minimum criteria for acute appendicitis were the appearance of neutrophils in mucosa, submucosa, and lamina propria[1]. The result of the Tzanakis score and Yash score was reported independently. The result was correlated with the findings obtained on histopathological examination and the data was analyzed using the necessary statistical calculations using SPSS 24.0 version, the results were then presented.

Observations and Results

Graph 01: Outcome of YASH scoring system
Graph 02: Outcome of Tzanakis Scoring system

Graph 03: Comparison of the final outcome of Yash scoring system with Tzanakis scoring system:
Graph 04: Negative Appendectomy rate of Yash scoring system:

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<th>Female</th>
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Graph 05: Negative appendectomy rate of Tzanakis scoring system:

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<td>Negative appendectomy rate</td>
<td>10.00%</td>
<td>10%</td>
<td>9.52%</td>
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Discussion

Acute appendicitis continues to exist as the most widespread emergency in the world. A delay in making a diagnosis is associated with various complications which increases the morbidity and mortality in patients therefore a prompt and reliable diagnosis of acute appendicitis is mandatory. Furthermore, negative appendicectomy also accounts for a loss of financial resources and is associated with morbidity in 10 to 15% of cases.

Despite big breakthroughs in the imaging field, there remains uncertainty in diagnosing acute appendicitis due to atypical presentations of the disease. It has been repeatedly shown that investigations like USG lack specificity due to its operator dependency whereas investigations like CT scan and MRI are highly-priced demand more advanced equipment and competency. This makes a detailed clinical examination with primary investigations such as leucocyte count as the backbone in diagnosing acute appendicitis. This has compelled many surgeons to use diverse scoring systems for diagnosing acute appendicitis. The clinical evaluation is reliable in 50% to 80% of cases. The evaluation is more complex in the extremes of age and women of reproductive age group due to atypical presentations.

The current study will deal with the evaluation of the Yash scoring system with the Tzanakis scoring system to diagnose acute appendicitis in a simple, reliable, and cost-effective way thereby reducing the negative appendectomy rate and thus morbidity associated with it.

In this study, the sample population consisted of 50 patients out of which 58% were males and 42% were females. The male to female ratio in our study was found to be 1.4:1 which is comparable to the study done by Kumar SLA et al[19] in which the male to female ratio was 1.6:1. A larger part of the study population (50%) was present in the age group of 15 to 29 years. The age group of 30 to 44 years had 26% of patients followed by 24% in the age group of 45 to 60 years. This is comparable to the study done by Kumar SLA et al[19] in which 40% of patients were in the 2nd to 3rd decade of life, 27% of patients in 3rd to 4th decade of life, and only 3% of patients in 5th to 6th decade of life.

All the patients who accomplished the eligibility criteria were subjected to detailed clinical examination, routine hematological investigations, C-reactive protein, USG and were scored based on Yash and Tzanakis scoring system. The decision to operate the patient including patients with scores less than the cut-off value.
was based on the clinical assessment and judgment taken by the consultant surgeon. All the patients underwent appendectomy with prior consent and the specimen was subjected to histopathological examination to confirm the diagnosis.

In our study, 82% of the patients were operated by open method whereas 18% of patients were operated by laparoscopy. The study done by Malla BR et al [20] consisted of 200 patients in which 128 patients (64%) underwent appendectomy by an open method and 72 patients (36%) underwent appendectomy by laparoscopy. The most common incision used in open appendectomy was Mc Burney’s in about 83% of cases followed by the right Para median which was used in 17% of cases. Similarly, in the study done by Lamture YR et al [17] the most common incision used was Mc Burney’s in 94.74% of patients followed by right Para median in 5.26% of cases. In our present study, 35 out of 50 patients (70%) had inflamed appendix intra-operatively. Out of the remaining 15 patients, five patients had enterocolitis, three patients had Meckel’s diverticulitis, three patients had the pelvic inflammatory disease (salpingitis), two patients had a ruptured ovarian cyst and two patients had inflamed mesenteric lymph node (with or without pus) as the intra-operative findings. Shashikala V et al [14] in her study had five out of 50 patients with an alternative diagnosis; out of which one patient had enterocolitis and four patients had a pelvic inflammatory disease. Another study was done by Kumar SLA et al [19] his study also reported six patients with alternative diagnoses in which three patients had salpingitis, two patients had an ovarian cyst and one patient had Meckel’s diverticulitis.

The new Yash score described by Lamture YR et al [17] in 2017 has a significant role in identifying acute appendicitis. It differs from earlier scoring systems by including various parameters such as C-reactive protein, leukocyte counts, USG, and clinical data. A score of seven or more in patients was considered as acute appendicitis and such patients were subjected to operative intervention.

In our study, out of ten parameters, tenderness in the right iliac fossa was the commonest sign seen in 100% of patients. The other two signs i.e. rebound tenderness and hyperesthesia in Sherren’s triangle was seen in 82% and 26% of patients respectively. The most common symptom was fever which was present in 88% of cases followed by nausea or vomiting which was found in 86% of the cases. Anorexia was seen in 72% of patients, whereas 68% of patients gave a history of migratory right iliac fossa pain. Out of the three investigations included in the scoring system, leucocytosis defined as WBC count more than 10000/mm$^3$ was present in 80% of cases. C-reactive protein with a value of more than 15mg/dl was present in 28% of cases with USG showing features of appendicitis in only 46% of cases.

In the present study, 34 patients had a score of seven or more, and 16 patients who had a score of less than seven according to the Yash score.

Out of the 34 patients who scored seven or more, there were 33 patients with features of appendicitis on histopathological examination whereas only one patient had histologically normal appendix with no features of inflammation.

Similarly, out of 16 patients who scored less than seven, there were 14 patients with a histologically normal appendix with no features of inflammation and only two patients with features of appendicitis on histopathology.

The sensitivity and specificity of the Yash scoring system in the present study were found to be 94.28% and 93.33% respectively. It had PPV and NPV of 97.05% and 88.50% respectively. The overall diagnostic accuracy of the Yash scoring system in our study was found to be 94%. The following results are comparable to the single original study done by Lamture YR et al [17] in which the sensitivity, specificity, PPV, and NPV was 99.48%, 92.86%, 99.48%, and 92.85% respectively. The diagnostic accuracy of the Yash score reported by Lamture YR et al was 98.56%.

The negative appendicectomy rate (NAR) of the Yash scoring system in the present study was found to be zero percent in males and 4.76% in females. This discrepancy in NAR was due to the high probability of other possible diagnoses in females of reproductive age group such as pelvic inflammatory diseases and ovarian cyst. The overall NAR observed for the Yash scoring system was 2% which is way lower than the accepted rate of 15 to 25%. In the study done by Lamture YR et al [17], the NAR was found to be 6.69% which is comparable to our study.

Tzanakis et al [13], in 2005 revealed a more comprehensible system to help in making the diagnosis of appendicitis. It includes four parameters comprising of specific signs, laboratory and radiological investigations such as right iliac fossa tenderness, rebound tenderness...
over the right iliac fossa, leucocytosis (WBC count>12,000/mm³), and USG. A score of 8 or more is considered as acute appendicitis.

In our study, out of the four parameters present in the scoring system, tenderness in the right iliac fossa was the commonest sign seen in 100% of patients whereas rebound tenderness and leucocytosis was found in 82% and 68% of the patients respectively. USG showed features of appendicitis in only 46% of cases.

In the present study, 30 patients had a score of eight or more, and 20 patients who had a score of less than eight according to the Tzanakis score.

The 30 patients who scored eight or more had 25 patients with features of appendicitis on histopathology whereas 5 patients had a histologically normal appendix with no features of inflammation.

Similarly, 20 patients scored less than eight out of which there were 10 patients with a histologically normal appendix with no features of inflammation and 10 patients with features of appendicitis on histopathology.

The sensitivity, specificity, PPV, NPV, and diagnostic accuracy of the Tzanakis scoring system in our study was found to be 71.42%, 66.67%, 83.33%, 50.00%, and 70% respectively. The low sensitivity and specificity rate was due to the presence of high false-negative and false-positive results.

The study done by Tzanakis et al [13] in 2005 had a sensitivity of 95.4%, a specificity of 97.4%, PPV of 96.5%, NPV of 96.5%, and diagnostic accuracy of 96.5% which is much higher as compared to our present study. This difference may occur due to low sample size, ethnic variation, and other demographic factors such as diet.

The study done by Shashikala V et al [14] in 2016 reported a sensitivity of 79.62%, a specificity of 83.3%, PPV of 97.72%, and NPV of 31.25% which were comparable to our present study. The study done by Iqbal MM et al [15] in 2018 had results similar to that of Tzanakis et al [13] with the sensitivity of 99%, a specificity of 91%, PPV of 99%, NPV of 91%, and diagnostic accuracy of 95%.

The study was done by Sigdel GS et al [16] and Kumar SLA et al [19] in 2017 had a specificity of 66.66% and 71.43% respectively which was comparable to our study whereas the NPV of both the studies was lower than our present study. Both studies had a sensitivity and PPV higher than our present study but the difference is not significant.

Similarly, the study done by BR Malla et al [20] in 2014 had sensitivity, specificity, PPV, and NPV of 86.9%, 75%, 97.5%, and 33.3% respectively. The outcome of the Tzanakis scoring system in the study conducted by Malla BR et al was comparable to our present study.

The negative appendicectomy rate (NAR) of the Tzanakis scoring system in the present study was found to be 10.34% percent in the males and 9.52% in females. The overall NAR observed for the Tzanakis scoring system was 10%.

The negative appendicectomy rate in our present study for the Tzanakis Scoring system was comparable to NAR obtained in the studies done by Shashikala V et al [14](12%) and Iqbal MM et al [15](10.30%).

The result of the Yash scoring system as compared to the result of the Tzanakis scoring system in our present study reveals that the Yash scoring system had a better outcome than the Tzanakis scoring system and was more efficacious than Tzanakis scoring system in diagnosing acute appendicitis. The disadvantage of the Tzanakis scoring system is that it does not include clinical symptoms such as fever, nausea and vomiting, anorexia, migratory right iliac fossa pain, and supportive investigations such as CRP which augments the accuracy of the scoring system. Another factor for the low specificity of the Tzanakis score is that it gives the highest weightage to ultrasonography in its scoring system which has variable sensitivity and specificity due to inter-observer bias.

The negative appendectomy rate of the Yash scoring system was dramatically lower than that of the Tzanakis scoring system.

**Conclusion**

- The Yash scoring system had sensitivity, specificity, PPV, NPV, and DA of 94.28%, 93.33%, 97.05%, 88.50%, and 94% respectively.
- The overall negative appendicectomy rate of the Yash scoring system was 2%.
- Similarly, the Tzanakis scoring system had sensitivity, specificity, PPV, NPV, and DA 71.42%, 66.67%, 83.33%, 50.00%, and 70% respectively.
• The overall negative appendicectomy rate of the Tzanakis scoring system was 10%.

• Thus, our study reveals that the Yash scoring system is a valuable and plausible modality in detecting acute appendicitis and reducing NAR due to its outstanding outcome regarding its sensitivity, specificity, PPV, NPV, and diagnostic accuracy when compared to Tzanakis scoring system.

• The study also shows that the Yash scoring system is a better tool to avoid unnecessary operations due to its exceptionally low negative appendectomy rate thus lowering morbidity in patients of acute appendicitis and thereby lowering the cost of treatment and prevention of misuse of valuable resources and manpower.

Ethical Clearance: Taken from institutional ethics committee.

Source of Funding: Self.

Conflict of Interest: Nil.

References
Euthanasia: Ethical or Non-Ethical

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Abstract

‘Euthanasia’ is a compound of two Greek words ‘eu’ and ‘Thanatos’ meaning, a good death. It is a practice of intentionally ending life to relieve from suffering and pain which are immeasurable within human limits. Basically it’s ending of life for the impaired, which is unable to achieve ‘moksha’ even after persistently or willingly trying to. In medical language, ‘termination of life by doctors at request by the patient’s close relatives or attendants for patient bedridden for years struggling and unable to revive. Euthanasia is a complex matter of concern. It poses both, positive and negative implications which should be worked on and implemented under guidelines by administrations at different settings. As certain developed nations have legalized Euthanasia, their proposals and recommendations for considerations can be considered as a base for projecting Euthanasia in developing countries like India.

Keywords: Euthanasia, legalized, implication, India.

Introduction

“Death is Not the Greatest Loss; The Greatest Loss is Dying within While One Lives”.

‘Euthanasia’ is a compound of two Greek words ‘eu’ and ‘Thanatos’ meaning, ‘a good death. Its a practice of intentionally ending life to relieve from suffering and pain which are immeasurable within human limits. Basically it’s ending of life for the impaired, which is unable to achieve ‘moksha’ even after persistently or willingly trying to. In medical language, ‘termination of life by doctors at request by the patient’s close relatives or attendants for patient bedridden for years struggling and unable to revive. Everyone who wishes well for the concerned want him/her to be free from the vicious cycle of sufferings and merciless they face on daily basis. Like the other terms filched from history, euthanasia had different meanings depending on usage. The first apparent credit goes to historian Suetonius, who described how Emperor Augustus, dying quickly and without suffering in the arms of his wife, Livia, experienced euthanasia he wished for. Francis Baconin the 17th century used euthanasia in medical context to refer it as an easy, painless, and happy death(1). He referred to an ‘outward euthanasia’, the term ‘outward’ he used to distinguish from a spiritual concept the euthanasia which regards the preparation of the soul. The author would like to highlight case of Aruna R. Shaunbagh(2) case which brought the entire nations vision towards passive euthanasia. Yes! It is the case which brought about the point of Euthanasia in India. This case attained limelight after the remorseless death of a nurse named, Aruna. Aruna was an Indian nurse who spent 42 extensive years in a vegetative state as a result of the sexual assault in 1973. While working as a junior nurse at King Edward Memorial Hospital, Parel, Mumbai, and Shaunbag was sexually assaulted by a ward boy. The boy strangulated
her with a dog chain around her neck which cut off oxygen supply to her brain leaving her deaf, blind, and deaf, paralyzed. From the day of her assault till the day she died on May 18, 2015 she survived on mashed food, she couldn’t move her hands or legs couldn’t talk or perform basic function expected from a human being.

To a surprise, the accused was charged with attempted murder, and was sentenced for seven years imprisonment which was reduced to six years and was finally set free in 1980. While, Aruna remained in a vegetative state for rest of her life it was 2009, a petition was accepted by the honorable Supreme Court on insistence of a journalist and activist, Pinki Vikrani. A 1994, constitutional validity of Indian Penal Code Section (IPC Sec) 309 was challenged in the Supreme Court(5). The Supreme Court declared that IPC Sec 309 is unconstitutional, under Article 21 (Right to life) of the constitution in a landmark judgment. But later, Vikrani questioned the court that if in the Article 21 of the Constitution of India can give Right to Life then why not Right to Death(5).

The Supreme Court of India later felt that Aruna wasn’t brain dead and could respond to certain stimulus. So, the petition was rejected. But, this case brought a revolution in the history of medical profession within India. Later, the panel of judges finally accepted the petition and granted legalized passive euthanasia making it a sensible judiciary act. Passive euthanasia is grossly different from active euthanasia, as the latter induces death or end the life of patient by administration of lethal agents. The apex court hereby, laid stringent guidelines under which passive euthanasia would be legally allowed only via a high-court monitored mechanism. An author has a question, was Aruna living a life or strangulated everyday for 42 years on the hospital couch? Did she deserve to be on the couch for 42 long years?

Another victim of circumstances, who laid on the death-bed hoping to donate all organs of his body for a noble cause, Kolavennu Venkatesh, a young chess player from Hyderabad who fought a bitter legal battle to compete in life is only fit to live in this world. But if an individual is incompatible to perform these acts and dependent for years to come isn’t it unfair to keep them in agony forever. To the honest, the author thinks, if Euthanasia is wrong the same should be applicable for the world. The debate has been increasingly significant because of the recent development in Netherlands and England wherein euthanasia is allowed. As a result, many nations across are now hotly debating whether to follow or not the Dutch example(4). In India, many health professionals, philosophers, psychologists have expressed their views for the same. Some are in favor while others are against. According to the author, Euthanasia is a way by which a doctor can free a patient from trap of misery. An individual who once wanted to live, be happy is now on the verge of daily suffering, whose dreams have been crushed and along with them their family is struggling, who want to wish to bring him out of it and wish for an end for him with a heavy heart.

Once a cheerful person lying on the hospital bed for all eternity, whose goals have now become a grave, whose identity is just a ‘ward patient ‘helpless’. Think of him/her ‘who once wanted to fill life with colors, wanted to nurture himself, grow and achieve something great in life, is lying pale and lifeless. Think for the mother who gave birth to a child, wishing success and fortune, blessed him to achieve something great in future, but seeing him lifeless, struggling, pale may give agony to her Darwin’s theory of ‘Survival of the fittest’ says that all species of organisms arise and develop through natural selection, inherited variations that increases the individual’s ability to compete, survive and reproduce. In simple language the specie that is fit to reproduce and compete in life is only fit to live in this world. But if an individual is incompatible to perform these acts and dependent for years to come isn’t it unfair to keep them in agony forever. To the honest, the author thinks, if Euthanasia is wrong the same should be applicable for Medical Termination of Pregnancy (MTP)(5). One may be thinking why? So, it would be wise to say that the person lying in a vegetative state couldn’t melt one’s heart enough to end his sufferings then what about ending a life that is not yet born. A distinction may be made between Euthanasia and abortion. Death intervenes before life in earnest has even begun. In Euthanasia people make decision about death at the other end of life, after in earnest has(2). But the Constitution doesn’t give right to end a suffering. How unfair is that? If mercy killing is unethical then MTP should also be considered the same. If the Supreme Court can approve MTP, then why not euthanasia?

The authors of the article analyzed both aspects against and favor of the concerned topic. As we recognize that it’s not only for competent patients, but also incompetent ones who can suffer from conditions that make their lives not worth living (5). We cannot
effect legal change in one go; we shall appreciate for liberalization of law. Once even if any modest change is made, people might realize that the next step and consecutive are also acceptable, even if we cannot see it now(4). The argument invoked by legal Right to die opponents is that the Right will be abused and that no legal safeguards can prevent its abuse. Example for voluntary euthanasia always a written consent is a legal requirement but this is not always obtained(6). In long run, the euthanasia may definitely be misused to end up the lives of the care needy or people suffering from terminal illness, or people who are to undergo transplantations(7). In earlier times, majority of people died before they reached the hospital but now due to gradual medical advancement life can be prolonged but not to the extent of bringing back the dead ones. Malafide Intention(7), in the era of declining mortality and justice, there is a possibility of misusing euthanasia for inheriting the property of the patient. ‘Mercy killing’ should not lead to ‘killing mercy’ in the hands of the noble medical profession(7). Previously disease outcomes was discussed in CURE but in contemporary world of disease and debated in terms of CARE(7).

CONCLUSION:Euthanasia is a complex matter of concern. It poses both, positive and negative implications which should be worked on and implemented under guidelines by administrations at different settings. As certain developed nations have legalized Euthanasia, their proposals and recommendations for considerations can be considered as a base for projecting Euthanasia in developing countries like India.

Conflict of Interest: Nil
Source of Funding: Self
Ethical Clearance: Nil

References
Survey as Research Design for Medical and Allied Health Care Professionals

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Abstract

Formally speaking, survey means encapsulating information from respondents by direct or indirect means (person to person, telephonic, post and electronic communication). Survey as method of extracting information form population (small or large) to study various health issues and its associated factors play an important mode in healthcare clinical practice and research domain. Nearly, all fields under the umbrella of healthcare are making use of surveys as their study design to extract the desired information via optimum method of performing a survey to their best for analyzing, devising and implementing associated health care policies. Surveys are being used in increasing number as they provide benefits to researchers, in contrast, it also posses certain setbacks which are greatly impactful if a less potential method of survey is chosen for a specific arena if its associated pit falls are ignored. Surveys when used in medical fraternity are generally classified as Epidemiological, Health delivery service and Questionnaire surveys.

Keywords: Healthcare, Professionals, Survey, Research, Questionnaire.

Introduction

Formally speaking, survey means encapsulating information from respondents by direct or indirect means (person to person¹, telephonic², post³ and electronic communication)⁴. Survey as method of extracting information form population (small or large) to study various health issues and its associated factors play an important mode in healthcare clinical practice and research domain⁶. Nearly, all fields under the umbrella of healthcare are making use of surveys as their study design to extract the desired information via optimum method of performing a survey to their best for analyzing, devising and implementing associated health care policies⁸. Surveys are being used in increasing number as they provide benefits to researchers, in contrast, it also posses certain setbacks which are greatly impactful if a less potential method of survey is chosen for a specific arena if its associated pit falls are ignored. Surveys when used in medical fraternity are generally classified as Epidemiological, Health delivery service and Questionnaire surveys⁹.

In the current article, the authors aim to throw light on issues in contest to:

1. Fabricating a survey.
2. Formulation of a questionnaire with basic guidelines.
3. Role of Pilot study in facilitating efficiency of a survey.
4. Benefit and shortfalls of different modes of survey.

1. Fabricating a survey: The most vital aspect to be kept in mind while planning a survey is “What is the researcher looking for”⁷? “What information does the researcher want to procure from his respondents”.

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When this aspect is clearly defined in the researcher’s mind, it enables the emergence of questions focused in the concerned area which the researcher commences to document in the form of a ‘Questionnaire’. Any confusion regarding the proximities of the topic to be studied will lead to unnecessary installation of either irrelevant or excessive number of questions in the questionnaire leading to unwanted deviation from the topic finally complicating the research process and producing unfruitful results.

2. **Formulation of a questionnaire:** In research when planning a questionnaire for survey as a study design, a researcher has two options:

A. **To use a reliable and validated questionnaire:** Using a validated questionnaire brings ease to the researcher in many ways. Firstly, the validated questionnaire exhibits favorable question, minimal exfoliates negligible topographical errors etc. Secondly, as the questionnaire has been used already in one population, the same questionnaire when used in different population provides with significant comparison or disguised in conclusion. Finally, if the researcher seeks hurry to perform a survey in a short span of time, it is greatly advised to use a ready validated questionnaire as validating questionnaire usually is a time consuming process.

B. **Designing a new questionnaire:** If a researcher plans to design a new questionnaire, many aspects have to be kept in mind right from the beginning process to the final implementation in the population. When documenting questions to be asked in a survey, researcher should prioritize and imply basic requirements for the optimum gathering of information from their respondents. After all these considerations are fulfilled, the final step should be validation of the questionnaire.

**Basic guidelines while designing a questionnaire for survey:**

- All questions should be framed in focused direction to procure exact information.
- Educational background of the population to be studied should be given prior most importance. Individuals with high to medium degrees can diversify in terms of mental engagements while responding to the questionnaire, whereas when studying people with low educational background, set of question in the questionnaire should be put to their simplest form.
- Any possible question, even with a slight predicting attitude to confuse the respondent, should not be inducted in the questionnaire.
- Vital questions should be documented in the beginning followed by questions of descending importance.
- Questions related to demographic information should be asked in last.
- Locally adhered terminologies should be used so as to prevent respondents from getting confused and preventing them from not responding to the questionnaire. Even if one question is left unanswered due to any reasons, shall lead to dropout and that particular questionnaire cannot be used for analysis.
- Short sentences, pictorials and diagrams (if possible) etc should be used.
- Use of long sentences should be kept at minimal as these produce high risk of creating confusion among respondents.
- Use of multiple and bright colors should be instituted in the form of pictures, diagrams or statements to make the questionnaire vibrant, hence catching eyes of respondents, hence getting visually attracted to questionnaire may make them feel happy and promotes active participation towards the survey.
- Questions in relation to privacy, affection, habits etc should be discussed in later phase of the questionnaire as in the beginning it’s important for a researcher to gain respondent’s trust rather than directly jumping on sensitive questions making the respondent feel uneasy and reluctant to answer for the same and leaving the questionnaire incomplete. This systematic procedure greatly accelerates the quality and quantity of information procured. Any incomplete questionnaire shall not be considered for statistical analysis leading to misinterpretation of results.
- Researcher should incorporate only optimum number of questions with concentration on quality and quantity of information.
- All questions with the aim to abstract associated information should be numbered in close proximity as it helps respondents to answer the nearly associated questions in a flow as respondents respond with deeper aspect and concentration, rather haphazardly arranged
Role of Pilot study in facilitating efficiency of survey: A pilot study should be considered as an important aspect before commencing a survey on a large sized population. Pilot study enables professionals with various benefits:

- Making necessarily corrections in the questionnaire.
- Checking spelling mistakes.
- Disarrangement of sequence for questions.
- Analyzing attitude of respondents towards questions.
- Attitude towards sensitive questions (if any).
- Need of modification in question language and series.

These alterations when executed in the early stage and on a small population help researcher when the same study is performed on a larger population with clarity in mind from absence of pitfalls from the questionnaire point of view and thus the researcher main focuses on data analysis for concluding with results.

Benefits and shortfall of different modes of survey:

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<thead>
<tr>
<th>Mode of Survey</th>
<th>Benefits</th>
<th>Pitfalls</th>
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<tbody>
<tr>
<td>Person to Person</td>
<td>– Easy motivating individuals to be a part of survey.</td>
<td>– Expensive than all other modes of survey.</td>
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<td></td>
<td>– On the spot classification of any doubt in contest to the questionnaire.</td>
<td>– Reluctance in answering sensitive questions.</td>
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<td></td>
<td>– Institution of AND on monetary and monetary benefits.</td>
<td>– Time consuming.</td>
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<td></td>
<td>– Personal contact between researcher and respondent delivers quality</td>
<td>– Large man force required if greater number of population is to be</td>
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<td></td>
<td>and accuracy in answering the questions.</td>
<td>covered.</td>
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<td>Telephonic</td>
<td>– Higher rate in response to sensitive questions as respondents that the</td>
<td>– Higher rate of non response as a whole as people tap down the phone if</td>
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<td></td>
<td>surveyor does not recognize them in personal.</td>
<td>not interested.</td>
</tr>
<tr>
<td></td>
<td>– Less expensive than Person to Person method.</td>
<td>– No means of easily convincing respondents to participate in the survey.</td>
</tr>
<tr>
<td>By Post</td>
<td>– Impactful in covering diverse populations at single go.</td>
<td>– Expensive</td>
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<td></td>
<td>– Cost efficient if nearby population is studied.</td>
<td>– Time consuming as it involves extensive arrangement of items to be</td>
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<td></td>
<td>delivered and items received from respondents.</td>
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<tr>
<td>Electronic</td>
<td>– Least expensive from all modes used for survey.</td>
<td>– High rate of non response.</td>
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<tr>
<td>Communication</td>
<td>– Easy compilation of information filled by respondents.</td>
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<td></td>
<td>– Faster analysis of data.</td>
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</table>

Analysis: Data received on completion of survey should be analyzed using respective statistical test for which s is always advised to have an experienced statistician right from day 1, as he/she is involved in steps from formulation, implementation and analysis of data. The mode of data analysis should be planned right from the beginning of designing of the survey. Data to be arranged in the form of tables with rows and columns should be well posturized before the final formatting of questions in the questionnaire. Data from telephonic and electronic communication can be easily compiled and put to analysis while data from person to person and telephonic survey needs time to input and arranged for data analysis. Test for significance relevant to the survey are expressed by the statistician to represent results in the best projective and expressive direction.

Conclusion

Survey in research is a method of excellence to gather information directly or indirectly from respondents if performed in a systematic manner. While planning
a survey, benefits and pitfalls of the selected method should be prioritized to move in the right direction to deliver accurate results after analysis of data.

**Ethical Clearance:** Not Applicable

**Source of Funding:** Self

**Conflict of Interest:** Nil

**Reference**


Impact of Quarantine on Psychological and Psychosocial Aspects in Individual and Health Care Staff

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Abstract

Even a thought for an outbreak of an infectious disease provokes unwarranted panic and emotional distress in population causing development of negative impacts on psychological and psychosocial parameters of an individual. So, in case of any real epidemic/pandemic outbreak the normal psychological and psychosocial parameters start getting affected gradually which rise in amplitude as time pass while the disease is in air. Immediately, starts the phase of stress and fear of either being a carrier or a healthy individual who will have to live a compromised life for a particular duration. Previous studies have shown quarantine period to grimly affect individuals along with their health care providers which can even go along for the coming years. These impacts if controlled by early execution of strategies through governmental, administrative and social bodies working resourcefully and effectively can reduce the distress before being amplified. The present paper outlines the negative impacts of quarantine on psychological and psychosocial domain in individuals put in quarantine along with health staff engaged in their treatment. In addition, the article also narrates and suggests recommendations after reviewing articles from reputed database published following the outbreak of Severe Acute Respiratory Syndrome Syndrome (SARS), Ebola Virus Disease (EVD) and Middle East Respiratory Syndrome Corona Virus (MERS CoV) with added suggestions in reducing the effects during and after quarantine.

Keywords: Quarantine, Isolation, Negative, Psychological, Psychosocial, Health, COVID-19.

Introduction

‘Quarantine’ is a public health measure characterized by separation and restriction in movement of individuals’ who are assumed to be exposed to a contagious disease, to confirm if they become unwell so as to reduce the risk of spreading the same to the healthy population¹,². Quarantine is similar to Isolation but not the same. ‘Isolation’ is defined as separation of patients diagnosed with a contagious disease from population who are not sick³,⁴. The well-known example of isolation is of Human Immunodeficiency Virus (HIV) positive patients in Cuba during the 80’s and 90’s⁴,⁵. Generally, both these terminologies are used as synonyms to each other but in fact, they differ in the categorization of patients from normal healthy population. Looking back in history, the term quarantine was used for the first time in 1127 AD in Venice, Italy following the outbreak of Leprosy which nearly wiped their major population². The same term was used after 300 years with an outbreak of Plague in United Kingdom, killing large number of people and health care workers⁶. Since then, the term has been used couple of times following outbreak of Ebola Virus Disease (EVD) during 2005 originating in Congo, West Africa⁷, Severe Acute Respiratory Syndrome (SARS) during 2003 originating in Toronto

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(Canada)\(^8\), Middle East Respiratory Syndrome Corona Virus (MERS-CoV) in Korea during 2015\(^9\) and now, its Corona Virus named ‘COVID-19’ starting from Wuhan, a city in China in 2019 which rapidly spread to other nations\(^2\). As an immediate response, the city of Wuhan was lockdown and the suspected individuals put to quarantine irrespective of their gender and age. In a short span, even nearby cities and major cities of China were put to lockdown with strategies following as exhibited in Wuhan for months to come while the remaining population was either asked to be contained at home or embossed at their present site till further communications\(^2\). This sudden outbreak left both, the people in quarantine and lockdown in a nowhere to go situation, firstly due to lack in awareness of the virus being spread and whether they themselves are affected by the virus and if they are affected, concern regarding their self, families, future, issues in association with social stigma \(^4, 10\), fulfillment of daily, personal and financial needs \(^11, 12, 13\). These thoughts start dominating an individual’s psychology creating negative engravings towards short and long term goals and propositions of life. The affected individual are put in quarantine while the unaffected to a lockdown wherein people still share and exhibit advantage than people in quarantine as they spend time with their family and loved ones, peruse studies if students, control financial balance by working from home, eat food of their choice etc. In the present article, the author would concentrate specifically on the negative impacts of quarantine. To achieve this goal, the impacts shall be documented as; negative impacts of quarantine. To achieve this goal, the impacts shall be documented as; negative impacts of quarantine.

The impacts shall be documented as: negative impacts of quarantine.

Strategies to mitigate consequences of quarantine:

1. Swift action to shrink emotional, psychological and social negative picture in a person promoting a normal psychological approach towards the existing temporary situation from professional Psychiatrist. Role of Psychiatrist have been proved to be vital in researches during quarantine following previous outbreaks \(^9\).

2. Availability of reliable, rational and uncomplicated information from governmental and public health departments involved directly in action or working in combination with the main agencies for recent intervention being implemented, along with future projections to be implied if required should be broadcasted on regular basis for betterment of even the underprivileged section of population \(^32\).

3. Dietary and sleep schedule, similar as that of prior to outbreak of Quarantine, should be followed as these unswervingly have an effect on mental Health.

4. Individuals can be kept occupied by endorsing them in their respective hobbies, choice thus preventing growth of even tiny negative impact on mental wellbeing.

5. A positive approach of helping others to conquer similar situation amongst family associates and populace in contact through social media promote ability to be occupied and accepting the condition and possibly looking for ways to eradicate the same \(^11, 15, 34\).
6. Assurance of a regular supply of daily needs for subjects in quarantine to individuals from underprivileged sections reduces risk for development of negative impact\(^3\).

7. In today’s world, mobile is a necessity than luxury. It has proved its metal to be efficient in slowing the creation of negative impacts even during long stays during quarantine as the individual are occupied by exploring their interest, exchanging views via social networking websites and coming across developments across the world\(^3,33\).

8. Government should initiate free online, broadcasting counseling programs via television and radio to minimize the figure of people being engraven amid negativeimpacts\(^34\).

9. Special focus to be paid on health staff working during quarantine by administrative and agencies delivering and monitoring services\(^35,36\).

10. Prioritization of steps taken to balance professional, psychological, personal and social attributes for staff engaged with quarantine subjects\(^35\) by benefitting from comfortable working hours in shifts, remuneration and perks apart from regular salaries should be constituted.

**Conclusion**

The phase of quarantine produces negative impacts on one’s psychological and psychosocial aspects of life. Some individuals present with few, while mostly demonstrate multiple negative impacts making the situation concernable bringing in interventions even from other domains of health care, example Psychiatry. Majority of individual kept in quarantine facilities present with sadness due to detachment from family, relatives and fear and concerns regarding upcoming future rejections from neighbors’, social setups. Anger towards inability to balance personal, daily and financial needs summite addition of other effects bulging the balloon of negative impacts. Even the health care providers experience the same issue of neglect from family, relatives and neighbors as they are thought to bring in infection from the quarantine facilities. Health worker friendly policies should be instituted from governmental agencies to minimize the exposure time for health workers, providence of duty off on regular intervals, extra remuneration. All health workers work in quarantine facilities with dedication without stepping back to impart best available treatments serving mankind. It should be brought to think that these health care workers too are humans and experience similar views as they are the one exposed to the pandemic or epidemic disease as the first shield of prevention of spread of the disease.

**Conflict of Interest**: NIL

**Source of Funding**: NIL

**Ethical Clearance**: Not applicable

**References**


Development and Assessment of Fluorinated Graphene Nanoparticles Modified Dental Adhesives

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²Assist. Professor, B.D.S., M.Sc., Ph.D. (Conservative Dentistry), Department of Conservative, College of Dentistry, University of Baghdad, Baghdad, Iraq

Abstract

Background: The success of adhesion to the tooth structure plays an important role in the dental restoration, which can effectively avoid the terrible clinical problems during the bonding process, including the secondary caries and the loading of adhesive compositions with fillers and nanoparticles with antibacterial properties has led to a significant reinforcement effect of the adhesive.

Objective: The current study is designed to investigate the effects of addition of 2% of fluorinated graphene on the adhesive-dentin hybrid layer for two types of commercially available universal adhesive, guided using the etch and rinse technique as a bonding procedure.

Method: Forty extracted premolar teeth will be divided into four groups of ten teeth. Group I: the non-incorporated (Prime & Bond Universal) bonding agent (Control group). Group II: using the 2% FG nanoparticles incorporated (Prime & Bond Universal) bonding agent. Group III: non-incorporated (All Bond Universal) bonding agent (Control group). Group IV: using the incorporated (All Bond Universal) bonding agent. The degree of conversion was also measured using Fourier transform infrared spectroscopy (FTIR). The antibacterial activity of the adhesives was evaluated using agar diffusion test against the following bacteria: Streptococcus mutans and Lactobacillus salivarius obtained from saliva.

Results: A significantly greater antibacterial activity was obtained with adhesives containing a 2% fluorinated graphene nanoparticles than other groups (P<.01). Degree of conversion of tested adhesives was not change significantly after addition of 2% of fluorinated graphene nanoparticles.

Conclusion: The antibacterial effect of adhesives that incorporated with 2% of fluorinated graphene nanoparticles was higher than the non-incorporated etch- and rinse adhesive systems. The degree of conversion of adhesives was not significantly different.

Keywords: Adhesive systems; Antibacterial activity; Degree of conversion; Etch & Rinse adhesive technique.

Introduction

Success in adhesive dentistry means long-lasting restorations. Notwithstanding, the loss of adhesion or retention of a resin composite restoration is a frequent problem observed by dental practitioners, especially due to bond strength degradation¹ ². The loading of adhesive compositions with fillers and nanoparticles has led to a significant reinforcement effect of the adhesive ³ ⁴ ⁵. Fluorinated graphene (FG), an up-rising member in the family of graphene derivatives, is a kind of one-molecule-thick material ⁶. Graphene has been reported to be highly cytotoxic for bacteria and can thus serve as an antibacterial material, so we could speculate that as a...
member of graphene family, FG may also have similar effect (7). In previous studies, the antibacterial function of graphene is believed to be caused by both physical and chemical effects (8).

**Materials and Method**

**Preparation of modified universal adhesives:**

Two commercial universal adhesive agents; Prime & Bond Universal adhesive (Dentsply, Tulsa dental specialties, USA) and All-Bond Universal adhesive (Bisco Inc, USA) were selected in this study. The fluorinated graphene nanoparticles (FGN) (Hyper Chem Co., chaina, Let. No. Q19011701) was used as filler particles and it was submitted to the silanization process to improve the adhesion interface between the filler nanoparticles and the adhesive matrix so that the FGN was treated with 3-metacryloxypropyltrimethoxy (MPS) silane coupling agent using a procedure described by Deb et al. in 1996 (9,10).

A percentage of 2 w% of FGN was chosen from a pilot study out of 4 different percentages (1, 2, 3, 4 w. %) because this concentration didn’t adversely affect the viscosity, color stability and flowability of the adhesives (11). Then the FGN was dispersed in 6 ml of each adhesive by ultrasonication for 1 h to obtaining a homogenous mixture.

**Degree of conversion test:** For FTIR spectroscopic analysis, equal droplet amount of each adhesive resin was placed on a transparent poly-ethylene film. With a gentle steam of air, the solvents were evaporated for 30 seconds and then covered with a second film and pressed softly to form a thin layer of the adhesive. The “sandwich” was placed into the sample holder of FTIR spectrometer (Equinox 55, Bruker, Germany) (Fig. 3), and the absorbance peaks of the unpolymerized adhesives were recorded by transmission mode at a resolution of 4 cm⁻¹, with scans in the range of 400-4000 cm⁻¹. The adhesives were then light-cured with an LED Bluephase (IvoclarVivadent, Lichtenstein) light-curing unit with a light intensity of 600 mW/cm² for 40 seconds and the absorptions were recorded for the cured adhesive specimens. The DC% was calculated from the ratio of absorbance intensities for aliphatic C=C (peak at 1638 cm⁻¹) and the internal reference of aromatic carbon-carbon double bonds (peak at 1608 cm⁻¹) were recorded before and after curing the specimens, according to the following equation (12): 

$$DC = \frac{1 - \frac{(1635 \text{ cm}^{-1} \times 1608 \text{ cm}^{-1})_{\text{uncured}}}{(1635 \text{ cm}^{-1} \times 1608 \text{ cm}^{-1})_{\text{cured}}}} \times 100\%$$

![Fig. 3. Set-up for measuring degree of conversion of adhesive resins by Fourier transforms infrared (IR) spectroscopy (13)].
**Microbiological Study:** The microbiological study was conducted in the Department of Microbiology in the Medical Center in Baghdad, to evaluate and test the antibacterial activity of incorporated adhesives and was compared to the control non-incorporated adhesives against selected microorganisms which was *Streptococcus mutans* and *Lactobacilli*, since these are the main microorganisms associated with the development and progression of carious lesion (Primary and secondary caries).

Adhesive specimenwells with an inner diameter of 8 mm and a depth of 1.0 mm was prepared. Total forty wells were prepared, ten wells for each group, 5 wells of each group were used for each microorganism. The medium that used for antibacterial activity test will be Mueller-Hinton agar for *Streptococcus mutans* and MRS broth for *Lactobacilli* (19).

The selective medium for the cultivation of *Streptococcus mutans* was Mitis Salivarius Bacitracin Agar and for *Lactobacilli* was MRS Agar.

**A. Culture Medias:**

1. **Mitis Salivarius Bacitracin Agar (MSB):**
   Mitis salivarius bacitracin (MSB) agar is the selective medium for the cultivation of MutansStreptococci.

2. **MRS Agar (Lactobacillus Selection Agar):** MRS Agar was a semi-defined, partially selective medium for the isolation and enumeration of lactobacilli from foods and from intestinal, vaginal, and dental flora.

**B. Isolation of microorganisms:**

The microorganisms were cultured directly from swabs that were taken directly from mouth of volunteer patients. The swab will be rolled over a small area of the surface at the edge on MSB agar and MRS Agar; then was streaked for isolation from this inoculated area.

For MSB agar, the plates was incubated anaerobically utilizing a gas pack for 48 hours at 37 °C then aerobically for 24 hours at room temperature, while for MRS Agar, the plates was incubated anaerobically for three days at 37 °C (15).

**C. Measurement of the inhibition zone:** After 24 hours of incubation, the MRS agar plates was removed from the incubator and was examined for the inhibition zone around each well in (mm) after 48 hours of incubation using a ruler around each disc. The measurement of the inhibition zone was done by two microbiologists separately to get the best and reliable standardized results for this test.

**Statistical Analysis:** Statistical analysis was done by Statistical Package for Social Sciences (SPSS) version 24. Results were calculated as mean ± standard error of means (SEM). Comparison among groups was done by using a one-way Analysis of variance (ANOVA). The statistically significant differences were considered when P<0.05.

**Results**

**Degree of conversion (DC%):** Table 2 and figure 2 showed that there were non-significant differences (P>0.05) in degree of conversion of incorporated All Bond Universal adhesive agent with 2% fluorinated graphene (Group II) compared to the corresponding degree of conversion of the non- incorporated All Bond Universal adhesive agent (Group I). Mean±SEM of degree of conversion of (Group I) & (Group II) were respectively, 85.9200±.27479 and 86.2600±.27536. Similarly, table 2 and figure 2 there were non-significant differences (P>0.05) in degree of conversion of the incorporated Prim & Bond Universal adhesive agent with 2% of fluorinated graphene (Group IV) compared to the non-incorporated Prim & Bond Universal adhesive agent (Group III). Mean±SEM of degree of conversion of (Group III) & (Group IV) were respectively, 74.8800±.21124 and 75.9200±.18547.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Degree of conversion (DC)% Mean±SEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I: The non-incorporated (Prime &amp; Bond Universal) bonding agent (Control group).</td>
<td>85.9200±.27479</td>
</tr>
<tr>
<td>Group II: The incorporated (Prime &amp; Bond Universal) bonding agent with 2% fluorinated graphene</td>
<td>86.2600±.27536</td>
</tr>
<tr>
<td>Group III: The non-incorporated (All Bond Universal) bonding agent (Control group).</td>
<td>74.8800±.21124</td>
</tr>
<tr>
<td>Group IV: the incorporated (All Bond Universal) bonding agent with 2% fluorinated graphene</td>
<td>75.9200±.18547</td>
</tr>
</tbody>
</table>

Table 2: The mean of Degree of conversion (DC) %in the four experimental groups
Antibacterial test: The mean and standard error of mean values of the inhibition zone for the *Streptococcus Mutans* microorganism results for tested adhesive groups are represented in tables (3). The results of this study showed that **Group IV: the incorporated (All Bond Universal) bonding agent with 2% fluorinated graphene** exhibited high percentage of reduction of the *Streptococcus Mutans* microorganisms among the tested adhesive groups as shown in figure (3). Furthermore, ANOVA test shows that there is a highly significant difference in SBS mean **group II (the incorporated All Bond universal + 2% fluorinated graphene)** in compression with **group I (the non-incorporated All Bond universal bonding agent)**(p<.01) and there is a highly significant difference in SBS mean **group IV (the incorporated Prim & Bond universal + 2% fluorinated graphene)** in compression with **group III (the non- incorporated Prim & Bond universal bonding agent)**(p<.01).

Table 3: The mean of diameter of inhibition in the four experimental groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Diameters of Inhibition Zone Mean±SEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I: The non-incorporated (Prime &amp; Bond Universal) bonding agent (Control group).</td>
<td>10</td>
<td>0.000 ±.0000</td>
</tr>
<tr>
<td>Group II: The incorporated (Prime &amp; Bond Universal) bonding agent with 2% fluorinated graphene</td>
<td>10</td>
<td>21.700*±0.232</td>
</tr>
<tr>
<td>Group III: The non-incorporated (All Bond Universal) bonding agent (Control group).</td>
<td>10</td>
<td>0.000±.0000</td>
</tr>
<tr>
<td>Group IV: The incorporated (All Bond Universal) bonding agent with 2% fluorinated graphene</td>
<td>10</td>
<td>21.8000±0.133 #</td>
</tr>
</tbody>
</table>
Discussion

Durable and high bond strength to dentin is the goal of all the restorative materials and procedures. Clinical failure of adhesive restorations happens more often due to insufficient sealing of cavity margins, with subsequent discoloration, rather than complete loss of retention. Results from the present study showed that the degree of coversion of tested adhesive agents that incorporated with FG nanoparticles and the pure adhesives are not change significantly. Secondary caries is one of the most common reasons which are responsible for the limited longevity of indirect restoration. In previous studies, the antibacterial function of graphene is believed to be caused by both physical and chemical effects. The most important mechanism is the bacteria cell membrane destruction by the sharp edges of graphene nanosheets in suspensions. The chemical effect is primarily oxidative stress created by reactive oxygen species (ROS) and extraction of phospholipids from the cell membrane. A study found that graphene layer reduces the attachment of microbes. Recently, researchers found that graphene oxide nanosheets would be an effective antibacterial material against dental pathogens. Our research showed that the antibacterial behavior of the conventional adhesives could be enhanced by FG and the effect is more obvious for specimens with higher FG. Similar to graphene, the physical damage toward bacteria by sharp edges and chemical effect may also be responsible for its antibacterial property.

Conclusion

In addition, adhesive/FG composites showed superior performance of killing S. mutans and Lactobacilli bacteria. The presented work shows FG has potential to improve antibacterial properties and degree of conversion of adhesive agents.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

Conflict of Interest: The authors declare that they have no conflict of interest.

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References


Duodenal Obstruction in the First Month of Life

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Abstract

Introduction: Duodenal obstruction in the 1st month of life is the most common etiology of bowel obstruction. We aim to analyze the causes, clinical and diagnostic spectrum, management and surgical outcome of duodenal obstruction in the first month of life. The method that we used were 26 newborns of duodenal obstruction reviewed by a cross-sectional study for 30 months (January 2017 - Jun 2019). All of the newborns were investigated to the demographic details, causes, clinical presentation, associated anomalies, radiological findings, surgery performed and their outcome. Our results show that of 26 neonates (16 males, 10 females). 17 newborns were presented within the first 3 days of life. The mean gestational age was 36.88 weeks (10 preterms, 16 terms). The birth weight was normal in 16 newborns. Duodenal atresia was the most frequent cause in 9 (35%) neonates followed by the annular pancreas in 8(31%), malrotation in 6(23%), congenital duodenal web in 2 (8%) and congenital peritoneal band in 1 (4%). Greenish vomiting was the most common presentation in 38%. Double bubble gas by abdominal x-ray in 65%. Associated anomalies were noted in 58%, cardiac defects being the most frequent 53%. Duodenoduodenostomy was performed in 73%. Feeding intolerance is the most frequent complication in 48%. 4 (15%) neonates died, mostly in malrotation 50%. The commonest cause of death was midgut gangrene in 50%. We concluded that the Duodenal obstruction is a common problem in newborns. Greenish vomiting was the most common warning finding. Associated anomalies were noted in more than half, cardiac defects being the most frequent. Early diagnosis and treatment is key to reduce post-surgical complications and improving outcome.

Keywords: Duodenal obstruction, annular pancreas, duodenal atresia.

Introduction

Duodenal obstruction in the 1st month of life is the most common etiology of bowel obstruction. Its incidence about once/2500 to 10,000 live newborns[1,2]. It can lead to complete or partial obstruction of the duodenum due to various intrinsic and extrinsic reasons for obstruction[3,4]. Various developmental defects (recanalization or rotation) of foregut lead to duodenal obstruction in the newborns[5,6]. The common causes of NDO are DA, CDW, MR of the gut and AP[2].

The clinical presentation of NDO varies depending on anatomical defect type[1,5]. Bilious emesis is a common clinical spectrum[1]. The helpful diagnostic modalities are plain x-ray of abdomen and upper gastrointestinal contrast x-ray[5]. There are many anomalies (cardiac, down syndrome, renal and others) have associated with NDO[6]. Timely diagnosis and aggressive resuscitation strategy of NDO is important to maximize the outcome[7]. Published studies on duodenal obstruction in the 1st month of life are very limited in Iraq. It is therefore important to report our experience in NDO. The main objective was to analyze the causes, clinical and diagnostic spectrum, management and surgical outcome of duodenal obstruction in the first month of life.

Patients and Method

Study Design: Twenty-six newborns of duodenal obstruction were reviewed with across-sectional study.
at the unit of pediatric surgery at Al-Ramadi Children and Maternity Teaching Hospital, Anbar-Iraq for 30 months from January 2017 till Jun 2019. We excluded newborns with the duodenal obstruction which died preoperatively. All of the newborns were investigated to the demographic details, causes, clinical presentation, associated anomalies, radiological diagnostic findings, surgery performed and their outcome. A complete examination of all newborns was done, the abdominal x-ray was done on all newborns which showed double bubble appearance in 17 neonates, water-soluble (upper gastrointestinal) contrast studies were done when indicated (2 newborns showed partial duodenal obstruction), abdominal ultrasound and ECHO were done when indicated to rule out associated anomalies. Preoperative resuscitations and surgical exploration have been done in all neonates, different surgical procedures undertaken according to the etiology. We defined birth weight as low if there was less than 2.5kg, as normal if it was more than or equal 2.5kg. The term neonate was considered if the gestational age of more than or equal 37 weeks and the preterm neonate was considered if the gestational age is less than 37 weeks. Postoperative care and follow up was provided for all neonates. Written informed consent from the patient’s parents has been taken. Ethical approval was obtained from the ethical approval committee at the University of Anbar.

**Statistical Analysis:** IBM’s SPSS Statistics (Statistical Package for the Social Sciences) for Windows (version 25, 2017) and Microsoft Excel for Windows (2019) was used for statistical analysis of the collected data. Categorical variables were expressed as frequency and percentage. One sample Chi-square test was used to compare the actual frequency of each subcategory against its expected frequency assuming all subcategories have an equal incidence at presentation. All tests were conducted with a 95% confidence interval. The P-value is generated by the chi-square goodness-of-fit test. The P-value is significant when < 0.05.

**Results**

26 neonates presented with NDO during the study period. Out of 26 neonates, 16 (62%) were males and 10 (38%) were females. The overall male to female ratio was 1.6:1. The age at the time of presentation (1-29) days, 17 (65%) newborns were presented within the first 3 days of life and the rest, 9 (35%) presented after 3 days of life. The mean gestational age was (36.88 weeks) ranged between 31-41 weeks (10, 38% were preterm and 16, 62% were term). The birth weight of these newborns was normal in 16 (62%) neonates and it was low in 10 (38%) neonates. The mean of hospital stay was 13 days ranged (5-25) days.

The causes of NDO are shown in table (1). Duodenal atresia was the most frequent cause which occurred in 9 (35%) neonates followed by the annular pancreas, which occurred in 8 (31%) neonates. Other causes of NDO were 6 (23%) neonates were malrotation, 2 (8%) neonates were congenital duodenal web and 1 (4%) neonate was a congenital peritoneal band.

<table>
<thead>
<tr>
<th>Causes</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duodenal Atresia</td>
<td>9</td>
<td>35%</td>
</tr>
<tr>
<td>Annular Pancreas</td>
<td>8</td>
<td>31%</td>
</tr>
<tr>
<td>Malrotation</td>
<td>6</td>
<td>23%</td>
</tr>
<tr>
<td>Congenital Duodenal Web</td>
<td>2</td>
<td>8%</td>
</tr>
<tr>
<td>Congenital Peritoneal Band</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>26</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Greenish vomiting was the most common presenting finding, reported in 24 (38%) neonates followed by dehydration in 18 (28%) neonates, jaundice in 10 (16%) neonates, abdominal distension in 7 (11%) neonates, bloody Stool in 3 (5%) neonates and milky vomiting in 2 (3%) neonates. (Table 2).

**Table (2): Frequency of signs and symptoms:**

<table>
<thead>
<tr>
<th>Signs &amp; Symptoms</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Vomiting</td>
<td>24</td>
<td>38%</td>
</tr>
<tr>
<td>Dehydration</td>
<td>18</td>
<td>28%</td>
</tr>
<tr>
<td>Jaundice</td>
<td>10</td>
<td>16%</td>
</tr>
<tr>
<td>Distension</td>
<td>7</td>
<td>11%</td>
</tr>
<tr>
<td>Bloody Stool</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Milky Vomiting</td>
<td>2</td>
<td>3%</td>
</tr>
</tbody>
</table>

More than half of newborns (15, 58%) had one or multiple associated anomalies. The majority of these anomalies are cardiac, observed in 8 (53%) newborns and appear to be statistically significant (p value= < 0.001). Anomalies of multiple, renal, skeletal, umbilical hernia and imperforate anus were also detected. (Table 3).
Table 3: Associated anomalies.

<table>
<thead>
<tr>
<th>Anomalies</th>
<th>Frequency</th>
<th>Percentage</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac</td>
<td>8</td>
<td>53%</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Multiple</td>
<td>3</td>
<td>20%</td>
<td>0.72</td>
</tr>
<tr>
<td>Renal</td>
<td>1</td>
<td>7%</td>
<td>0.3</td>
</tr>
<tr>
<td>Skeletal</td>
<td>1</td>
<td>7%</td>
<td>0.3</td>
</tr>
<tr>
<td>Umbilical Hernia</td>
<td>1</td>
<td>7%</td>
<td>0.3</td>
</tr>
<tr>
<td>Imperforate Anus</td>
<td>1</td>
<td>7%</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Radiological findings of NDO, only one newborn had polyhydramnios by prenatal ultrasound, two newborns had PDO (CDW) by water-soluble (upper gastrointestinal) contrast studies and 17, 65% (9=DA, 8=AP) newborns had double bubble gases by abdominal x-ray. While the operative findings of NDO are DA in 9 neonates, AP, in 8 neonates, 6 neonates were MR, 2 neonates were CDW and 1 neonate was CPB.

The surgical repair was performed for 26 neonates (according to type of anomalies), duodenoduodenostomy was performed to 19 (73%) neonates (DA=9, AP=8 and CDW=2). Ladd procedure was performed to 7 (27%) neonates.

During the postoperative period, feeding intolerance is the most frequent complication 10 (48%) newborns with statistically significant (p value= < 0.001), death in 4 (19%), wound infection in 3 (14%), sepsis in 2 (10%), dehiscence and aspiration pneumonia each in one newborn. (Table 4).

Table 4: Complication of NDO.

<table>
<thead>
<tr>
<th>Complication</th>
<th>Frequency</th>
<th>Percentage</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeding Intolerance</td>
<td>10</td>
<td>48%</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Death</td>
<td>4</td>
<td>19%</td>
<td>0.76</td>
</tr>
<tr>
<td>Wound Infection</td>
<td>3</td>
<td>14%</td>
<td>0.78</td>
</tr>
<tr>
<td>Sepsis</td>
<td>2</td>
<td>10%</td>
<td>0.39</td>
</tr>
<tr>
<td>Dehiscence</td>
<td>1</td>
<td>5%</td>
<td>0.15</td>
</tr>
<tr>
<td>Aspiration Pneumonia</td>
<td>1</td>
<td>5%</td>
<td>0.15</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Out of 26 neonates in this study, 22 (85%) neonates were survived. Overall, 4 (15%) of the 26 neonates died. The highest mortality was observed in malrotation 2 (50%) deaths, There was a significant association between mortality and malrotation (Odds Ratio=1), DA and AP each in one (25%) death. (Table 5)

Table 5: Mortality according to the etiologies of the NDO:

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malrotation</td>
<td>2</td>
<td>50%</td>
<td>1</td>
</tr>
<tr>
<td>Duodenal atresia</td>
<td>1</td>
<td>25%</td>
<td>0.33</td>
</tr>
<tr>
<td>Annular pancreas</td>
<td>1</td>
<td>25%</td>
<td>0.33</td>
</tr>
</tbody>
</table>
The commonest cause of death was midgut gangrene in 2 (50%) with Odds Ratio=1, sepsis and aspiration pneumonia each in 1 (25%) death. (Table 6)

Table 6: Causes of death:

<table>
<thead>
<tr>
<th>Causes of death</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midgut gangrene</td>
<td>2</td>
<td>50%</td>
<td>1</td>
</tr>
<tr>
<td>Sepsis</td>
<td>1</td>
<td>25%</td>
<td>0.33</td>
</tr>
<tr>
<td>Aspiration pneumonia</td>
<td>1</td>
<td>25%</td>
<td>0.33</td>
</tr>
</tbody>
</table>

Discussion

NDO is the most frequent etiology of bowel obstruction in the 1st month of life[8,9]. Among 26 study populations, 16 (62%) were males and 10 (38%) were females. The overall male to female ratio was 1.6: 1. There is a male predominance in this study, which agrees with reports of other studies [6,7,10] that found (m=16,f=14),(m=193,f=94), (m=56,f=25) respectively. The age at the time of presentation (1-29)days, 17(65%) newborns were presented within the first 3 days of life and the rest, 9(35%), presented after 3days of life, which was similar to the results conducted by other studies[11] that found day one of life is the most frequent age of presentation (12 newborns).

In this study, the mean gestational age was (36.88 weeks) ranged between (31-41) weeks, 16 (62%) were term and 10 (38%) were preterm, which agrees with reports of other series [10,11] that found (term=79%, preterm=21%), (term=61%, preterm=39%) respectively. The birth weight of these newborns was normal in 16 (62%) neonates and it was low in 10(38%)neonates, these findings confirmatory to the other studies[11] were found that 2.15kg was the mean birth weight. The mean of hospital stay was 13 days ranged (5-25)days.

In this study, more than half of newborns (15, 58%) had one or multiple associated anomalies, which seems to be higher than the results of other studies [6,7,10,12] that found the associated anomalies are [57%, 50%, 27%, 50%] respectively. The majority of these anomalies are cardiac, observed in 8 (53%) newborns and appear to be statistically significant (p value= ˂ 0.001). This result is consistent with other studies[7,10,13] who found cardiac anomalies were the most common defect (32%, 7%, 48%) respectively. While in the other studies Kumar P. et al[11], Avci V. et al [12] found that trisomy 21 it was higher associated anomalies(32%,69%) respectively, this might be due to difference in sample size and newborn characteristics.

Greenish vomitus was the typical presentation of NDO reported in 24 (38%) neonates followed by dehydration in 18(28%)neonates. This result is consistent with Qiang Shu et al[7] who found that vomiting was the most common symptom (86%) followed by dehydration (30%), while Rattan K. N. et al[10], Avci V. et al [12] found that vomiting was the most common symptom (100%, 75%)respectively, followed by upper abdominal fullness (69%, 38%)respectively, this might be due to recurrent vomiting led to dehydration.

In this study, more than half of newborns (15, 58%) had one or multiple associated anomalies, which seems to be higher than the results of other studies [6,7,10,12] that found the associated anomalies are [57%, 50%, 27%, 50%] respectively. The majority of these anomalies are cardiac, observed in 8 (53%) newborns and appear to be statistically significant (p value= ˂ 0.001). This result is consistent with other studies[7,10,11] who found cardiac anomalies were the most common defect (32%, 7%, 48%) respectively. While in the other studies Kumar P. et al[11], Avci V. et al [12] found that trisomy 21 it was higher associated anomalies(32%,69%) respectively, this might be due to difference in sample size and newborn characteristics.

Radiological findings of NDO, by prenatal ultrasound only one newborn had polyhydramnios, by water-soluble (upper gastrointestinal) contrast studies...
two newborns had PDO (CDW) and by abdominal x-ray 17.65% (9=DA, 8=AP) newborns had double bubble gases. Kumar P, et al\[11\] in their study found that among 31 newborns, the polyhydramnios was observed in one neonate. On the other hand, Qiang Shu et al\[7\], Kumar P, et al\[11\], Avci V. et al\[12\]found that among(287, 31, 32) newborns respectively, double bubble appearance was observed in(143, 31, 24) newborns respectively, this might be due to difference in sample size and causes of obstruction.

The surgical repair was performed on all newborns, according to a type of defects, diamond duodenoduodenostomy was the preferred procedure in DA, CDW and AP \[14,15\], It was performed to19, 73% neonates(DA=9, AP=8 and CDW=2), Ladd procedure was performed in 7,27% neonates. Few studies evaluate NDO postoperative complication, in this study feeding intolerance is the most frequent complication(10, 48%) newborns with statistical significant (p value= < 0.001) followed by death(4, 19%newborns) and wound infection (3, 14%newborns), while other studies\[7,13\] found that the most frequent complication is wound infection (7,3) newborns respectively followed by dehiscence (3,1) newborns respectively, this might be due to reasons related to NDO and chronic intrauterine duodenal obstruction led to dilatation of duodenum and stomach that lead to dysmotility\[13\].

Out of 26 neonates in this study, 22 (85%) neonates were survived. Overall mortality was 4 (15%), which was in between reported international publication Kaddah SN, et al \[4\], Rattan K. N. et al\[10\], Kumar P. et al\[11\], Avci V. et al\[12\] and Erickson J et al\[16\] were observed a mortality of (21%, 13.5%, 22.5%, 9%, and 22.5%) respectively. Prematurity, sepsis, post-surgical complications, associated anomalies, and pneumonia are contributing factors to high mortality in newborns with duodenal obstruction \[17,18\]. In this study the highest mortality was observed in malrotation 2(50%) deaths, our opinion, there was a significant association between mortality and malrotation(Odds Ratio = 1), while Kaddah SN et al\[4\] found that the highest mortality was observed in newborns of duodenal atresia(27%) this might be due to a different distribution of associated anomalies. In this study the commonest cause of death was midgut gangrene 2(50%) deaths followed by sepsis and aspiration pneumonia each in 1(25%) death, while in the other studies Qiang Shu et al\[7\] were observed 50% of death result of bowel necrosis and sepsis, Avci V. et al\[12\] were observed that sepsis and cardiac defects are the most frequent cause of mortality, Rattan K. N. et al\[10\], Kumar P. et al\[11\] were observed that sepsis was the most frequent cause of mortality (50%, 39%) respectively, this might be due to different presentation time and distribution of associated anomalies. Our opinion that early diagnosis and treatment of NDO is key to reduce post-surgical complications and to improving outcome.

**Conclusion**

DO is a common problem in newborns. NDO presentation can be varied, but greenish vomiting was the most common warning finding. Associated anomalies were noted in more than half of newborns, cardiac defects being the most frequent. The important investigation work-up of NDO was a plain abdominal x-ray. Early diagnosis and treatment of NDO is key to reduce post-surgical complications and improving outcome.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval MOH and MOHSER in Iraq.

**Conflict of Interest:** Non

**Funding:** Self-funding

**References**


Levels of Some Cytokines in Iraqi Patients with Multiple Myeloma

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Abstract

Introduction: Multiple myeloma is hematological disease characterize by abnormal functioning plasma cell result in deterioration in different organs include bone and kidneys in addition to other complications. The study aimed to measure some cytokines in the serum and determined if there is possibility to use this cytokines as predictor for the multiple myeloma.

Materials and Method: Blood samples was drown from 58 patients and 24 sex and age match control, serum then isolated and proper ELISA kit then used to determined level of β2 microglobulin, interleukins-13, 19, and 38.

Result: The result demonstrated significant increase in β2 microglobulin in patients compare to control (1.347+0.714 vs. 0.913+0.253), p = 0.00, interleukin-13 significant increase in patients group compare to control group (204.56+189.84 vs. 106.17+52.07), p=0.001, interleukin-19 non-significant increase in patients group compare to control group (22.46+42.09 vs. 11.252+8.574), p= 0.211, interleukin-38 significant increase in patients group compare to controls (60.087+54.131 vs. 26.791+21.382), p= 0.00.

Discussion: The results of this study indicate that IL-13 and 38 possible to use as predictor for the disease.

Keywords: Health, Iraqi patients; myeloma; cytokines.

Introduction

Multiple myeloma (MM)is malignant disease effect plasma cell, this accompany with a number of changes include elevation in calcium levels, renal insufficiency, bone lesion and metabolic disorder in addition to the abnormal protein in the urine contributed to renal disorder (1).

The bone disorder is the most common complication in the MM, the damage that occur in the bone result from stimulation of osteoclast formation. In addition, there is decrease in the bone formation have been reported and this attributed to the suppression effect of myeloma cell on osteoblast cell (2).

Other MM complications is renal disorder that occur due to light chain immunoglobulin (LCI) accumulation (3). Anemia is common hematological complication and account (60% to 80%) untreated active MM patients and its usually normochromic and normocytic type (4).

Interleukin 13 is a Cytokine involve in allergy and inflammation, they produce pathological effect when produce in high dose, however, in considerable dose useful against intestinal helminthic parasite (5).

Interleukin 19 (IL-19) is one of interleukin 10 (IL-10) family that produce from activated monocyte, T and B cell to lesser extent, non-immune cell like keratinocytes and foetal membranes (6, 7).
Interleukin-19 receptors abundant in the skin, lung and reproductive organ tissue, and seen to be important in production T helper 2 (TH 2) cytokine and induce expression of IL-6, IL-8 and IL-10 in monocyte. IL 19 elevated in the asthma and a number of the disease include type1 DM, aging, vascular disease and rheumatoid arthritis[8].

Interleukin 38 one of interleukin family 1 that include 11 type and play important role in the inflammation, it have specific receptor called IL-1 receptor-related protein 2 (IL-1Rrp2, IL-36R) these receptor considered as interleukin36 (IL36) receptor antagonist.

Interleukin 38 considered anti-inflammatory agent through inhibit the effect of IL 36 in that receptor[9].

Beta2 microglobulin is a polypeptide presented in the serum its origin is the cell membrane of all nucleated cell in which found in tight junction with major histocompatibility complex 1(MHC1): elevated its level reflected increase intrinsic kinetic activity of tumor cell including DNA and RNA kinetic, therefore, it's important for staging, determined disease severity, response to chemotherapy and prognosis[10].

This study was aimed to: Determined level of some cytokines in the serum of the patients with multiple myeloma.

Study the possibility of the serum level of these cytokines to be used as predictor of multiple myeloma disease.

Subject, Material and Method

The study was conducted in Baghdad city in (Baghdad hospital/medical city and hematological center) from October 2018 to May 2019 where (58) patients diagnosed to be have multiple myeloma and most of them regularly visit the hospital to receive the chemotherapy. From the total number of the patients, (36) was male and (22) was female.

The control subjects were randomly selected which were apparently healthy, the control were age, sex, body mass index (BMI) matching to patients group.

Disposable syringe and needles used for blood collection, venous blood sample about six ml collected from patients and healthy volunteers in plain tube, blood sample were centrifuge at 2000 rpm for 5 minute to obtain serum.

The serum were divide in Eppendorf tubes and freeze in -20 C° until all serum collected to measure the biomolecules by ELISA.

Serum β2- Microglobulin determined through use commercial kit from Demediect by sandwich ELISA method.[11]. Reference range of β2 microglobulin (1-2 microgram/milliliter) [12].

Serum IL-13 and IL-19 determined using commercial kit obtain from CUSBIO, using sandwich ELISA method.[11].

Serum IL-38 determined using commercial kit obtain from My BioSource, using sandwich ELISA method [11].

The results were express as mean (+/-) standard error of the mean. The statistical analysis was perform using statistical package for social science (SPSS 23), independent student (T) test use to test the degree of significance difference between the patients and control, the p value less than 0.05 considered statistically significant.

Results

Serum levels of biomolecules: Table (1) showed serum level of β2 microglobulin, IL-13, 19 and 38 in controls and patients group.

Table (1) Serum level β2 microglobulin, IL-13, 19 and 38 of in patients and controls group

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Patients group (n=58)</th>
<th>Controls group (n=24)</th>
<th>Degree of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2 microglobulin (µg/ml)</td>
<td>1.347±0.714</td>
<td>0.913±0.253*</td>
<td>0.000</td>
</tr>
<tr>
<td>Interleukin 13 (pg/ml)</td>
<td>204.56±189.84</td>
<td>106.17±52.07*</td>
<td>P=0.001</td>
</tr>
<tr>
<td>Interleukin 19(pg/ml)</td>
<td>22.46±42.09</td>
<td>11.252±8.574</td>
<td>P=0.211</td>
</tr>
<tr>
<td>Interleukin 38(pg/ml)</td>
<td>60.087±54.131</td>
<td>26.791±21.382*</td>
<td>P=0.00</td>
</tr>
</tbody>
</table>
The results express in term of (mean ± standard deviation of the mean), n=number of the subject, (*) = significance difference, (p<0.05) compared to control group.

**Discussion**

The study showed level of \( \beta_2 \) microglobulin significance increase in patients group compare to control group despite most of the patients received MM therapy, this indicate the disease is active.

Interleukin 13 significant increase compared to control group, T helper 2 (Th2) cell one of the immune cell that secreted IL-13, so activation of Th2 cell enhance it to secrete the cytokines that include IL-13, Th2 derived from T helper 0 cell (Th0) and required to IL-4 for this development (13), IL-4 secreted from number of cell like natural killer (NKC), Basophil, or even CD4 cell themselves (14).

Many studies showed that total CD4 cell significant reduce in the number among MM patients and CD4/CD8 ratio going to be reduce (15, 16), besides that, T helper 2 in most studies reported to be either decrease or not significance change in MM in contrast to other CD 4 cell like T helper 1 cell and T regulatory cell (16,17), so, from all above it is possible to suggest that Th2 cell have no any role in increase IL-13 in this study.

Eosinophil cell is large factory that secreted many type of biomolecules include the IL-13 (18), so, high level of IL-13 in this study can possibly attributed to activation of eosinophil.

The role of eosinophil in MM have been studied and showed that eosinophil found in association with plasma cell in bone marrow and secrete factors that necessary to plasma cell survival in B.M. (19).

In pathological aspect, Tinaet.al. Showed eosinophil also to enhance myeloma cell proliferation and considered distinct pathway involve in myeloma cell development beside the proliferation development produce by stroma cell pathway (20).

Basophil is another cell that secreted IL-13 (21), however, few studies that determined the relation between basophil and MM, the only information available indicated the basophil stimulate and secrete IL-13 in response to IgE secretion (22), the same relation it’s possible to be found in case IgE myeloma, however IgE myeloma considered as one of unusual myeloma that include also IgD and IgM which is totally represent more than 10% of all MM cases (23).

Mast cell also synthesis and release IL-13 in addition to other mediators (24), many studies noted the role of mast cell in MM pathogenesis especially in the angiogenesis and osteolytic disorder through secretion of its mediators (25, 26).

Mast cell can be activated by IgG which is one of the most anti body secreted by myeloma cell also could be considered one of the biomolecules that stimulate mast cell to secrete IL-13 (27).

Additionally, interaction between Mesenchymal stem cell and MC cell lead to higher secretion of stem cell factor (SCF) (28) which is in turn stimulate mast cell to secrete IL-13 (29), all of these factor strongly suggest the mast cell stimulation as one of main cause of increase IL-13 in this study.

Natural Killer cell (NKC) is another immune cell that secrete IL-19, however, involvement of these cell in IL-13 level elevation in MM it’s unlikely, since these cell showed inverse relationship with stage of myeloma, this support by the study that demonstrated normal or arise in the levels of NKC in the early or treatment stage of MM (30), while in advance and active disease going to depleted (31).

The study demonstrated non-significant difference in IL-19 between control and patients group.

T helper 2 cell one of the immune cell secreted IL-19, T cell in all type (CD4 and CD8) have been reported either decrease or not change in MM (15,16), so, T cell unable to increase IL-19 secretion in MM and this agree with this study.

Although IL-19 secrete also from B cell, its effect on IL-19 level is negligible since the studies showed the secretion of this cytokine from B cell is very low and irregular (32,33).

Monocyte is other immune cell that secrete IL-19, number of the studies evaluate the level of monocyte in MM, one of them showed deterioration in monocyte function including chemotactic function in patients with MM (34), other demonstrated deterioration in monocyte that showed improvement in monocyte enhance dendritic cell activity upon immunotherapy (35), so give the possibility to suggest that activation of monocyte to secrete and increase IL-19 is unlikely and this agree with this study.
The study demonstrated significant increase in IL-38 level compare to the control. Interleukin 38 release from apoptotic cell like in lung or breast cancer (36), IL-38 act to decrease IL-6 secretion from macrophage that play significant role in the MC growth and proliferation, so, increase IL-38 secretion can explain as a compensatory mechanism to fight MC development (37).

Myeloma cell also report to increase apoptosis of immune cell, and this considered as way to explain increase in IL-38 level since these IL release from apoptotic cell as mention before (38). Interleukin 38 have been report to be secrete from B cell (39).

**Conclusion**

Multiple myeloma produce change in the number of cytokines, either proinflammatory and anti-inflammatory both can be effected. Elevation of IL-13 is possible in the patients with MM and this possibility attributed to the stimulation of number of immune cell that known to secrete IL-13 in MM like eosinophil, mast cell. Possibility to use IL-13 and IL-38 as predictor for MM disease.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

**References**

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1562 Medico-legal Update, October-December 2020, Vol. 20, No. 4


The Incidence of Orofacial Cleft in Wassit

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Abstract

Cleft lip and palate are the second most common congenital deformity after club foot. The aim of this study is to determine the incidence of orofacial cleft in Wassit. This a retrospective study is diagnosed 300 patients with various types of orofacial cleft from 125800 live births. The incidence of clefs in our population higher than other countries. Cleft lip and palate are more common than other types of orofacial cleft and more common in male than female. While isolated cleft palate are more common in female than male.

Keywords: Incidence, orofacial cleft.

Introduction

Cleft lip and palate are the second most common (about 1 in 700 live births) congenital deformity, after club foot deformity, these localized clefs produce multiple local and regional medical challenges: they affect face shape, speech, and swallowing, as well as increase the frequency of middle ear infections.(1)

Isolated cleft palate (CP) occurs with a genetic pattern differ from that of cleft lip (with or without cleft palate). (2) The cleft lip incidence is 0.47% of live births, with a male: female ratio of 0.74 (in Caucasians) (2) while the occurrence of cleft lip with palate varies among genetic groups, 0.4 per 1000 in blacks, 1 per 1000 in Caucasians, 1.5 per 1000 in Chines, 2.2 per 1000 in Japanese, and 3.5 per 1000 in Amerindians (3). The M:F ratio of CL/P is 2:1 and of CL is 1.55:1 (in Caucasians)(2).

Aim of Study: Determine the incidence of orofacial cleft in Wassit and provide database for health care foundation to improve the provided care.

Patients and Method

This a retrospective study is include all the live birth in was sit between May 2013-May 2018. All the variants of orofacial clefs were recorded in this study. All the normal and abnormal perineonatal deaths were excluded from this study. The number of orofacial clefs in this study depends on the documentation of oral and maxillofacial department which the only center in the government deals with such cases, due to poor registration of hospitals regarding the congenital deformities.

Result

For five years, all the hospital in wassit recorded about 125800 live birth. Three hundred patients with orofacial cleft attended to department of oral and maxillofacial surgery which the only department that receive such cases in the wassit government, 2.3 for 1000 birth.

From 125800 live birth, 170 patients were presented with cleft lip and palate (1.3 for 1000 birth), while 25 patients with isolated cleft palate (0.01 for 1000 birth), and 105 with cleft lip only (0.8 for 1000 birth), table 1.

From 300 cases with orofacial cleft, 105 are cleft lip, 170 are cleft lip and palate and 25 cases present with isolated cleft palate, table 2.

From 170 patients were presented with cleft lip and palate 110 patients were male (64%) and 60 were female (35%), from 105 patients with cleft lip, 75 were male and 30 were female, from 25 patients with isolated cleft palate, 20 were female (80%) and 5 were male (20%), table 3.

Table (1) Incidence of orofacial cleft

<table>
<thead>
<tr>
<th>Cleft Type</th>
<th>No. of Cases</th>
<th>Incidence (per 1000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleft lip</td>
<td>105</td>
<td>0.83</td>
</tr>
<tr>
<td>Cleft lip &amp; palate</td>
<td>170</td>
<td>1.35</td>
</tr>
<tr>
<td>Cleft palate</td>
<td>25</td>
<td>0.2</td>
</tr>
<tr>
<td>All types of cleft</td>
<td>300</td>
<td>2.38</td>
</tr>
</tbody>
</table>
Table (2) Percentage of orofacial cleft

<table>
<thead>
<tr>
<th>Cleft type</th>
<th>No. of cases</th>
<th>Percentage (300 cases)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleft lip</td>
<td>105</td>
<td>35%</td>
</tr>
<tr>
<td>Cleft lip &amp; palate</td>
<td>170</td>
<td>56%</td>
</tr>
<tr>
<td>Cleft palate</td>
<td>25</td>
<td>9%</td>
</tr>
</tbody>
</table>

Table (3) Sex distribution of orofacial cleft

<table>
<thead>
<tr>
<th>Cleft type</th>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>Cleft lip</td>
<td>75</td>
</tr>
<tr>
<td>Cleft lip &amp; palate</td>
<td>110</td>
</tr>
<tr>
<td>Cleft palate</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>190</td>
</tr>
</tbody>
</table>

Discussion

In this study the incidence of orofacial cleft in our government slightly higher than other countries that may be explain by: the relative causes of clefts are the following: genetic, environmental, and developmental factors. The occurrence of orofacial cleft in families containing varied numbers of clefts conclude that the interaction of three to six genes that responsible for this malformation. MSX1 and TGF b3 are among the most responsible genes. There are over 350 known syndromes associated with clefts of which half are of monogenic origin, in our population many of parents are genetically related, especially in the rural area, also that explain why the prevalence higher in rural area (periphery) than the center of city (urban), when the parents belong to one grant family (second or third relative) when the genetic factor play a great role in this situation. Also higher incidence of orofacial cleft in our population may be belong to environmental cause: when high percentage of pregnant ladies suffering from anemia, uterine viral infection and malnutrition (vitamin deficiency), and deficient of regular follow up during pregnancy to avoid the environmental precipitating factor like: folic acid, vitamin B6, B12 and iron deficiencies.

In this study cleft lip and palate higher than cleft lip or cleft palate only, and this is agree with most of studies.

Also in this study the incidence of cleft lip and cleft lip and palate higher in male than female in contrast to isolated cleft palate higher in female than male and it is agree with most of studies.

Conclusion

1. The incidence is higher in our government than other developed countries.
2. The incidence is higher in low socioeconomic people.
3. Cleft lip and palate higher than other types of clefts.
4. Isolated cleft palate higher in female than male.

Suggestions:

1. The health care providers in the government should be improved their efforts to get expansion in number of orofacial cleft and establish large qualified center.
2. Regular gynecological follow-up to the pregnant ladies to avoid environmental causes anemia, vitamin deficiencies, viral infection etc.
3. Regular visits to rural area to avoid late diagnosis, as the surgical intervention should be in fixed schedule.
4. Provide good and continuous training for health provider and work as multidisciplinary team.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

Funding: Self-funding

References

Reference Range of Chest Expansion in Healthy Adult Living in al-Muthanna Governorate

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²Specialist M.B.Ch.B. Al-Muthanna Health Director/Iraq

Abstract
Measurement of chest expansion is one of the important steps in clinical examination of respiratory system and this can be done by chest palpation with hands or more accurately by using of tape measure. Assessment of chest expansion can give an important idea about different disorders in the thoracic cage or in the lung itself by detection of any limitation of chest expansion. Also it used for evaluation of progression and treatment response of many pulmonary, neurological and rheumatological diseases. In number of famous clinical text books the lower normal limit of chest expansion is 5 cm but we suggest that the reference range of chest expansion is varied in different races. In this study 130 healthy non smoker volunteers living in al-Muthanna governorate, 65 females(50%) and 65 males(50%), were involved by measuring of their chest expansion with tape measure at level of the fourth intercostal space for two times and best reading was taken for each participant. The body weight of the participants in this study range from 52 kg to 86 kg in females and from 50 kg to 90 kg in males. According to this study normal range of chest expansion was(2-5 cm) (mean=3.35cm,SD=0.685) for females and (2 - 5.5cm)(mean=3.38 cm, SD=0.734) for males where the best result was in athletics. There is age wise reduction of chest expansion for both male and female where the mean chest expansion in 18-34 years age group is 3.74 cm for female and 3.72 for male, in 35-64 years age group is 3.57 cm for female and 3.66 cm for male and in those of 65 years and more is 2.63 cm for female and 2.66 for male. So the chest expansion lower normal limit of participants in this study (as sample of Iraqi people) is vary from other reference ranges. This can be explained by the difference of life style and genetic factors between societies and we should not depend on same reference range for chest expansion in deferent races.

Keywords: Chest expansion, Reference range, Tape measure.

Introduction
Normal chest expansion is vital for respiratory system function and tissues oxygenation and this depend on presence of effective normal thoracic cage mobility and healthy lung where any disorder interfere with chest expansion will affect the oxygen supply of the vital organs of the body. Evaluation of chest expansion is important step in physical examination of respiratory system that include inspection, palpation, percussion and auscultation. Clinically thoracic mobility and expansion can be checked by inspection and manual palpation or use of tape measure which is more accurate, simple and inexpensive method [1,2]. The tape measure do not detect any asymmetry in chest expansion, which is useful clue for many underlying respiratory diseases. There are many method for detection of chest expansion by tape measure with little difference. Some of them use level of 4th intercostal space and repeat the test two times and take the best result while other depend on 6th rib level for measurement of chest expansion [3,4]. Frequent measurements of chest expansion is reliable method for
severity assessment and treatment response of many primary pulmonary, neurological and musculoskeletal diseases such as such as: chronic obstructive pulmonary diseases, Ankylosing spondylitis, muscular dystrophy and spinal cord injuries \cite{5,6,7}. These disorders affect normal movement and expansion of chest and interfere with normal pulmonary function. With good surgical and/or medical treatment including physiotherapy, there will be good chance for chest expansion improvement and regular chest expansion assessment and better to do that with tape measure, as the manual method for chest expansion test is subjective and less accurate can effectively monitor this. Many clinical references consider a difference of more than 5cm between full expiration and full inspiration is normal \cite{8}. The dependence on same normal range of chest expansion for deferent races is scientifically unaccepted as there is significant genetic and environmental factors determine the body characters of different populations. In male chest expansion is more than that in female because of difference in surface area between the two and respiratory muscle of the male is relatively stronger than female \cite{9}. Thoracic cage compliance is reduced with age after third decade of life, according to that the chest expansion will reduced \cite{9,10}. Few studies deal with placement of normal range of chest expansion for Iraqi population. This study was done to detect normal chest expansion in healthy adult of al-Mthanna city, Iraq.

**Method**

This observational study was achieved at center and periphery of al-Muthenna governorate in Iraq. This study was completed between July 2018 and February 2019. 130 healthy wealthy Persons without history of respiratory disease or smoking or trauma or concurrent disease. The age of participants is 18 years and above of both genders.

**Study Protocol:** Chest expansion was measured circumferentially with a centimeter tape measure and diametrically transversely by means of tape measure. Readings were carried out in one plane at 4th intercostal space, the difference between deep expiration and deep inspiration has been measured for two times and the best reading was taken, the patient in sitting position.

**Statistical Analysis:** Data was analyzed by using Primer of Biostatistics. For descriptive statistics mean, standard deviation, proportions and percentages were used. For Analysis of Variance (ANOVA) were used. Statistical significance was taken as $< 0.05$.

**Results**

Table 1: Gender wise mean and range of chest expansion of the study subjects .

<table>
<thead>
<tr>
<th>Gender (n=65)</th>
<th>Mean (cm)</th>
<th>SD (cm)</th>
<th>Range (cm)</th>
<th>Male (n=65)</th>
<th>Mean (cm)</th>
<th>SD (cm)</th>
<th>Range (cm)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female (n=65)</td>
<td>3.35</td>
<td>0.685</td>
<td>2 - 5</td>
<td>Male (n=65)</td>
<td>3.38</td>
<td>0.734</td>
<td>2 - 5.5</td>
<td>0.815</td>
</tr>
</tbody>
</table>

Mean chest expansion of females was 3.35 cm (SD=0.685) and with range of 2-5cm. Mean chest expansion of males was 3.38 cm (SD=0.734) with range 2-5.5 cm, There was no statistically significant difference observed in chest expansion of both genders .

Table 2 Comparison of the Chest expansion means among the studied age groups in female patients.

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Mean Chest expansion (cm)</th>
<th>SD (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 - 34</td>
<td>3.74</td>
<td>0.46</td>
</tr>
<tr>
<td>35 - 64</td>
<td>3.57</td>
<td>0.56</td>
</tr>
<tr>
<td>65 and above</td>
<td>2.63</td>
<td>0.43</td>
</tr>
</tbody>
</table>

P value $<0.00001$*
Table 3 Comparison of chest expansion means among the studied age groups in male patients.

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Mean Chest expansion (cm)</th>
<th>SD (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 - 34</td>
<td>3.72</td>
<td>0.56</td>
</tr>
<tr>
<td>35 - 64</td>
<td>3.66</td>
<td>0.59</td>
</tr>
<tr>
<td>65 and above</td>
<td>2.66</td>
<td>0.51</td>
</tr>
<tr>
<td>P value</td>
<td>&lt;0.00001*</td>
<td></td>
</tr>
</tbody>
</table>

Mean chest expansion of males was 3.72 cm (SD=0.56) in (18 – 34) years, 3.66 cm (SD=0.59) in (35 - 64) years, 2.66 cm (SD=0.51) in (65 and above) years.

Mean chest expansion of females was 3.74 cm (SD=0.46) in (18 – 34) years, 3.57 cm (SD=0.56) in (35 - 64) years, 2.63 cm (SD=0.43) in (65 and above) years.

In Table no. 2 and 3, it was observed that there was statistically significant age-wise difference in chest expansion values of measurement in both male and female subjects.
Discussion

One of the important steps in physical examination is assessment of chest expansion and this can be done by inspection and palpation with examiner hands (manual) or by tape measure. Several respiratory, neurological and rheumatological disorders can affect normal chest expansion and pulmonary function. Careful regular measurement of chest expansion is important for effective management of these disorders. The reference range of chest expansion in different populations is not the same and special range for each community should be present. In this study we try to determine the reference value of chest expansion for healthy fit adult Iraqi population. Mean chest expansion of female in this study was 3.35 cm at 4th intercostal space and mean chest expansion of males was 3.38 cm at the same intercostal space. So the value in female is slightly lesser than that in male and this related to difference in body built of different genders. In our study chest expansion results was higher for younger age group (table 2 and 3) and this can be explained by aging effect on musculoskeletal compliance by calcification of the cost chondral cartilage and reduction of elasticity of the thoracic cage connective tissue [11]. In comparison with the western population, Iraqis have lesser chest expansion and this may be related to difference in genetic and environmental factors including life style and social activities. Other study showed some sort of relation between body mass index and chest expansion [10] but in our study there is no such relation.

Conclusion

According to this study, the normal chest expansion range at 4th intercostal space for healthy adults of al-Muthanna city in Iraq is 2-5.5 cm. Male has slightly greater value of chest expansion than female and there is decline in chest expansion in older age group for both males and females. There is no significant relation between chest expansion value from one side and height and weight from other side. We focus on vital need for special reference range of chest expansion in each country to reach more accurate diagnosis and assessment of many neurological, pulmonary and rheumatological diseases as there is significant variation in normal chest expansion in different populations. We suggest making larger studies in different areas in Iraq with higher number of participants.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: Non

Funding: Self-funding

References


A Correlative Study to Assess the Knowledge and Practice of Housewives Regarding Householdwaste Management in Selected Rural Community at Mangalore with a View to Provide an Information Pamphlet

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Abstract

Background: Improper waste management deteriorates public health, degrades quality of life, and pollutes local air, water and land resources. It also causes global warming and climate change and impacts the entire planet. Environmental problem faced by communities living near garbage dumps and marshy lands include air pollution, fires, smoke, flooding etc. Long term health problems like asthma, bronchitis, hepatitis, jaundice, malaria, elephantiasis and typhoid too have been faced by communities. So waste which are considered to be hazardous need to be disposed off safely and adequately.

Materials and Method: A descriptive correlative research design was used for this study. The sample comprised of 60 housewives between 18-55 years of age. The sample was drawn through purposive sampling technique. The study was carried out in rural community at Mangalore. A structured knowledge questionnaire was used to determine the knowledge of the subjects and practice rating scale was administered to assess the practice scores of housewives regarding household waste management.

Results: Majority of the subjects (65%) were having only average knowledge with knowledge score ranging between 0-20 with median 18 and SD 3.01 and majority of the subjects were have moderate practice score on waste management with median 20 and SD 3.52. There was a significant relationship between knowledge score and practice score of the subjects on waste management (r=0.346, df=59.000, p<0.05).Conclusion: The findings of this study suggest that there is a need for educating the mothers regarding the proper household waste management. Women take a key role in housekeeping and disposing domestic waste. So the Government and frontline health workers need to take special initiatives to curb this public issue.

Keywords: Knowledge; practice; waste management; housewives; information pamphlet.

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Introduction

Waste is a material that no longer serves a purpose and so is thrown away(1) . In some cases, what one person discards may be re-used by someone else(2). All wastes are particularly hazardous (3). Improper disposal of wastes causes negative impact on the environment, whether it is unsightly litter in urban streets or contaminated air, soil or water (4). This improper waste disposal can affect the life negatively by creating an
environment that is potent for developing diseases in man as well as other living things. Toxic waste can seep into the ground and contaminate our water supplies, and sometimes cause widespread diseases. Due to uncollected waste and improper disposal techniques drains also get clogged which lead to mosquitoes by which various diseases like malaria, chikungunya, viral fever, dengue etc. arise and affect the health of people adversely\(^\text{\textsuperscript{4,5}}\). The output of daily waste depends upon the dietary habits, lifestyles, living standards, and the degree of urbanization and industrialization\(^\text{\textsuperscript{6}}\). In India we produce 300 to 400 Gms of solid waste per person per day in town of Normal size but exceptionally about 500 to 800gms of solid waste is generated per capita per day in metro cities like Delhi and Bombay\(^\text{\textsuperscript{7}}\). The total population of Karnataka as per 2011 census is 5.273 core (52.73), Urban 33.98\% and rural 66.01\%. In Karnataka the waste quantities are estimated to increase from 46 million tons in 2001 to 65 million tons in 2015\(^\text{\textsuperscript{7,6}}\). In a day-to-day life many people are unaware of the proper domestic waste disposal and its harmful effects on the health and environment\(^\text{\textsuperscript{8}}\). Community based education, especially in women, on household waste management and hygiene is essential in order to improve the health of the community\(^\text{\textsuperscript{9}}\).  

**Aim:** The aim of this study is to assess the knowledge and practice of housewives regarding household waste management in a selected rural community at Mangalore with the view to provide an information pamphlet.

**Objectives of the Study:**

1. To determine the level of knowledge regarding household waste management among housewives as measured by a structured knowledge questionnaire.
2. To identify the practice of housewives on household waste management as measured by a practice rating scale.
3. To find the relationship of knowledge and practice scores of housewives on household waste management.
4. To find the association of knowledge scores of housewife on household waste management with the selected demographic variables.
5. To find the association of practice scores of housewife on household waste management with the selected demographic variables.

**Materials and Method**

**Study setting and sample size:** A descriptive correlative research design was used for this study. The sample comprised of 60 housewives between 18-55 years of age. The samples were selected by purposive sampling technique. The study was carried out in rural community at Mangalore, India. A structured knowledge questionnaire was used to determine the knowledge of the subjects with 34 knowledge items with the maximum score of 34 to assess the knowledge of housewives regarding household waste management, and practice rating scale was administered to assess the practice scores of housewives regarding household waste management with 17 statements with three point scale i.e. always, sometimes and never. The statements were scored 2, 1, 0 respectively. The maximum possible score is 34. In order to educate the housewives on this regard the investigator has developed and distributed an information pamphlet to all subjects after collecting the data.

**Data Analysis:** The data was collected after obtaining prior permission from the concerned authority to conduct the study. The participants were assured about the confidentiality of their responses. The data was analyzed in terms of objectives of the study using both descriptive and inferential statistics. The data obtained was plotted in the master sheet.

**Findings:**

**Results**

**Section I. Description of baseline Proforma**

- Maximum number of subjects (38.3\%) were in the age group of 30-39 yrs.
- Maximum number of subjects (48.3\%) were Muslims
- Most of the subjects (40\%) have primary education
- Most of the subjects (45\%) belong to nuclear family
- Majority of the subjects (40\%) had monthly income of 4001-6000
- Most of the subjects (41.7\%) received information from Magazines/Newspapers.
Section II: Knowledge score obtained by the subjects regarding household waste management.

- Majority of the subjects (65%) have average knowledge, 33.3% of subjects have good knowledge and only 1.7% of them have excellent knowledge regarding house hold waste management. This shows that majority of the subjects (65%) have only average knowledge regarding house hold waste management. (figure-1)

Section III: Practice score of subjects regarding household waste management

- Out of 60 housewives, 80% housewives had average disposal practices, 20% had good practices on disposal of house hold waste management. (Table-1).

Section IV: Correlation relationship between knowledge and practice scores of subjects regarding household waste management

- There is a moderate positive correlation between the knowledge and practice score \( (r = -0.346, \text{df}=58, \text{table value}=0.236) \). (Table-2)

Section V: Association between knowledge score and selected demographic variables.

- There is no significant association between knowledge score with demographic variables except in religion and educational qualification.

Section VI: Association between practice score and selected demographic variables

- There is no association between practice score of subjects with demographic variables

Discussion

- The present study revealed that, majority of the subjects (65%) have average knowledge, 33.3% of subjects have good knowledge and only 1.7% of them have excellent knowledge regarding house hold waste management.

- Results obtained from this study consistent to the results reported in another study conducted by Arora L et al it was found that 162(54%) of the respondents could be classified as possessing low knowledge, whilst 138(46%) respondents were having medium level of knowledge regarding waste management (2).

- In present study results revealed that out of 60 housewives, 80% housewives had average disposal practices, 20% had good practices on proper disposal of house hold waste management. The findings of the study was similar the study conducted by John Jince V el al(2014) 75.1% had average practice, 24.9% had poor practice and none of them had good practice regarding domestc waste management (13).

There is moderate positive correlation between the knowledge and practice score \( (r = -0.346, \text{df}=58, \text{table value}=0.236) \).

The findings of the study was similar the study conducted by John Jince V el al(2014) The study shows a positive correlation between knowledge and practice of housewives on management of domestic plastic waste \( (r=0.071) \)(13)

Section II: Knowledge score obtained by the subjects regarding household waste management.
Section III: Practice score of subjects regarding household waste management.

Table 1: Distribution of practice score of subjects on household waste management in terms of frequency and percentage N-60

<table>
<thead>
<tr>
<th>Practice Score</th>
<th>Grade</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>23-34</td>
<td>Good</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>12 -20</td>
<td>Average</td>
<td>48</td>
<td>80</td>
</tr>
<tr>
<td>0-11</td>
<td>Poor</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Section IV: Table 2: Correlation between knowledge and practice of subjects on household waste management. N-60

<table>
<thead>
<tr>
<th>Variables</th>
<th>Max Score</th>
<th>Min Score</th>
<th>SD</th>
<th>r value</th>
<th>df</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>31</td>
<td>16</td>
<td>3.01</td>
<td>0.346</td>
<td>58</td>
<td>Significant</td>
</tr>
<tr>
<td>Practice</td>
<td>30</td>
<td>15</td>
<td>3.52</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

'\text{r} = 0.346 \text{ at df} = 58

Figure 2: Scatter diagram showing the correlation between knowledge and practice scores of housewives regarding household waste management

Conclusion

The findings of this study revealed that, majority of the subjects had only average knowledge regarding household waste management and the study suggest that there is a need for educating the mothers regarding the proper waste disposal, since the women take a key role in housekeeping and disposing domestics waste. So the Government and frontline health workers need to take special initiatives to curb this public issue.
Acknowledgement: The investigator sincerely acknowledges the support given by Mrs. Shycil Mathew, Shanti Lobo and Janat Miranda for their timely support and smart guidance to complete the project. Sincere gratitude towards the study participants for their cooperation.

Financial support and sponsorship: Nil

Conflicts of Interest: There are no conflicts of interest

Ethical Clearance: Written informed consent was obtained from the housewives. Ethical clearance was obtained from institutional ethics committee of CHCT, Mangalore.

Reference


14. Gracy R. A study to assess the knowledge and practice regarding the proper disposal of refuse and sewage among housewives in a selected rural area of hesaraghatta, Bangalore with a view to develop a booklet (Doctoral dissertation).
Effectiveness of an Animation Video on Behavioral Response to Pain among Toddlers During Immunization in a Selected PHC at Mangalore India

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Abstract

Background: Immunization is regarded as one of the most significant medical achievements of all times. Recently, increasing attention has been paid to the pain resulting from routine childhood immunizations. In addition, lack of adequate pain management during immunization exposes children to unnecessary suffering and the potential for long-term consequences, such as fear of needles. Hence this study is intended to assess the Effectiveness of an Animation Video On behavioral Response to Pain among Toddlers during Immunization.

Materials and Method: A quasi-experimental research (non-equivalent post-test-only control group) design was used for this study. The sample was drawn through purposive sampling technique and comprised of 60 toddlers undergoing for immunization (30 in experimental and 30 in control group) in a selected PHC at Mangalore, India. Data was collected using Behavioral response assessment scale to pain. (Modified FLACC behavioral assessment scale).

Results: Majority of the toddlers in Group I (83.33%) were having moderate behavioural response to pain, only 16.7% were having severe behavioural response to pain whereas in Group II (100%) all the toddlers experienced severe behavioural response to pain during immunisation. The mean score of behavioural response to pain of Group II (10.97±1.69) was greater than that of Group I (7.17±1.206).

Conclusion: An animation video during immunization can be an effective, simple, non-invasive, and cost effective diversional technique had a positive effect on children’s distress behaviour and pain and having no side effects on the toddlers.

Keywords: Animation video, immunization, behavioral response, pain, toddlers.

Introduction

Prevention of disease is one of the most important goals in child care. During infancy and childhood, preventive measures against certain infectious diseases are available. Immunization is an important and cost effective public health tool for disease control(1). Routine immunization injections are the most common painful procedures in childhood. Most of the immunizations are administered early in a child’s life. Most toddlers and many school-age children experience high distress during immunization injections(2).

Untreated immunization pain might also lead to distorted negative memories of that experience.

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Contact Address: 9538812499
Ultimately, early pain is linked to poorer healthcare attitudes and elevated fear and avoidance of medical procedures in adulthood\(^3\). The child’s distress is upsetting not only for the child but also for the adults involved—both parents and professionals—and it often makes it more difficult to complete the needed procedure\(^4\).

Non-pharmacological method of pain control are widely accepted and can be used with or without analgesics\(^5\). A cardinal responsibility of a community health nurse taking part in giving immunisation is to alleviate pain, promote growth, and development of child\(^6\).

**Aim:** To assess the Effectiveness of an Animation Video On behavioral Response to Pain among Toddlers during Immunization.

**Objectives of the Study:**
1. To determine the behaviour response to pain among toddlers receiving immunisation with animation video (Group I) as measured by structured behavioural response assessment scale to pain (modified FLACC behavioural assessment scale).
2. To identify the behaviour response to pain among toddlers receiving immunisation without animation video (Group II) as measured by structured behavioural response assessment scale to pain.
3. To compare the effectiveness of animation video on behavioural response to pain among toddlers in Group I and in Group II during immunisation.
4. To find the association between behavioural response to pain among toddlers receiving immunisation in Group I and in Group II with their selected demographic variables.

**Materials and Method**

**Study setting and sample size:** A quasi-experimental research (non-equivalent post-test-only control group) design was used for this study. The sample was drawn through purposive sampling technique and comprised of 60 toddlers undergoing for immunization (30 in experimental and 30 in control group) in a selected PHC at Mangalore India. The parents were interviewed on the basis of baseline proforma. The child along with the caregiver was taken to the treatment room. In experimental group (Group I) the investigator made the parent sit on the chair comfortably with the child on the lap and showed the animation video. In control group (Group II) the children were placed in position and restrained by the nurse or parent as routine practice of the clinic.

The behaviours of the subjects were observed by the investigator in three phases during the procedure, i.e., placing the child in position, pre immunisation, and actual procedure until the child is out of the immunisation room. The investigator observed and scored the child’s behavioural response to pain during immunisation injection using the behavioural response assessment scale to pain. Data was collected using behavioral response assessment scale to pain. (Modified FLACC behavioural assessment scale).

**Data Analysis:** The data was collected after obtaining prior permission from the concerned authority to conduct the study. The participants were assured about the confidentiality of their responses. The data was analyzed in terms of objectives of the study using both descriptive and inferential statistics. The data obtained was plotted in the master sheet.

**Findings:**

**Results**

**Section I: Description of baseline proforma**

- Majority (83.3%) of the samples were between 12-18 months of age.
- Majority (63.3%) of the samples were male.
- All (100%) of the children were undergoing DPT immunisation.
- Highest percentage (46.7%) of the children showed minimal resistance to previous immunisation.
- Majority (56.7%) of children had more than 10 kg of weight at the time of immunisation.

**Section II: Description of level of behavioural response to pain among toddlers during immunisation procedure in Group I:** The area-wise mean percentage shows that the behavioural response to pain was more in the areas arms (mean percentage=66.67%) legs (mean percentage=65.00%), and restlessness (mean percentage=65.00%). There was less behavioural response to pain in the areas like muscle tone (mean percentage=33.33) cry and vocalisation (mean percentage=58.33%) and facial expression (mean percentage=41.67), in the Group I. [Table-1].
Section III. Description of level of behavioural response to pain among toddlers during immunisation procedure in Group II.

The area wise behavioural response to pain in Group II was more in the areas of arms, muscle tone, and restlessness (mean percentage=96.67%) cry and vocalisation (mean percentage=95%) leg (mean percentage=88.33%), and facial expression (mean percent=71.67%). [Table-II]

Section IV. Comparison between level of behavioural response to pain scores in Group I and Group II

The majority of the toddlers in Group I (83.33%) are having moderate behavioural response to pain, only 16.7% are having severe Behavioural response to pain whereas in Group II all toddlers (100%) experienced severe behavioural response to pain during immunisation. [Figure-1].

Section V: Significant difference between level of behavioural response to pain among toddlers during immunisation injection in Group and Group II

Significant difference between level of behavioural response of pain in Group I and Group II showed that Group II has severe behavioural response than Group I (10.97±.928 V/S 7.17±1.206). The calculated value (t=13.680, p<0.001) indicates the significant difference between the behavioural response scores between the two groups. [Table-III].

Section VI: Association of level of behavioural response to pain among toddlers in Group I and Group II with their selected demographic variables

The behavioral response to pain among toddlers in Group I and Group II with their selected demographic variables shows no significant association at 0.05 level of significance. [Table-IV].

Table-I: Description of level of behavioural response to pain among toddlers during immunisation procedure in Group I. $N_1 = 30$

<table>
<thead>
<tr>
<th>Item</th>
<th>Max. Possible Score</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>Mean %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial Expression</td>
<td>2</td>
<td>0-2</td>
<td>.83</td>
<td>.379</td>
<td>41.67</td>
</tr>
<tr>
<td>Arms</td>
<td>2</td>
<td>0-2</td>
<td>1.30</td>
<td>.466</td>
<td>65.00</td>
</tr>
<tr>
<td>Legs</td>
<td>2</td>
<td>0-2</td>
<td>1.33</td>
<td>.479</td>
<td>66.67</td>
</tr>
<tr>
<td>Cry &amp; Vocalization</td>
<td>2</td>
<td>0-2</td>
<td>1.17</td>
<td>.379</td>
<td>58.33</td>
</tr>
<tr>
<td>Muscle Tone</td>
<td>2</td>
<td>0-2</td>
<td>1.27</td>
<td>.450</td>
<td>63.33</td>
</tr>
</tbody>
</table>

Table-II: Description of level of behavioural response to pain among toddlers during immunisation procedure in Group II. $N_2=30$

<table>
<thead>
<tr>
<th>Item</th>
<th>Max. Possible Score</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>Mean %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial Expression</td>
<td>2</td>
<td>0-2</td>
<td>1.43</td>
<td>.507</td>
<td>71.67</td>
</tr>
<tr>
<td>Arms</td>
<td>2</td>
<td>0-2</td>
<td>1.77</td>
<td>.430</td>
<td>88.33</td>
</tr>
<tr>
<td>Legs</td>
<td>2</td>
<td>0-2</td>
<td>1.93</td>
<td>.254</td>
<td>96.67</td>
</tr>
<tr>
<td>Cry &amp; Vocalization</td>
<td>2</td>
<td>0-2</td>
<td>1.90</td>
<td>.305</td>
<td>95.00</td>
</tr>
<tr>
<td>Muscle Tone</td>
<td>2</td>
<td>0-2</td>
<td>1.93</td>
<td>.254</td>
<td>96.67</td>
</tr>
<tr>
<td>Restlessness</td>
<td>2</td>
<td>0-2</td>
<td>1.93</td>
<td>.254</td>
<td>96.67</td>
</tr>
</tbody>
</table>
Figure 1: Comparison of level of behavioural response to pain among toddlers during immunisation procedure in Group I and Group II.

![Figure 1: Level of behavioral response to pain among toddlers in Group I and Group II](image)

Table III: Significant difference between level of behavioural response to pain scores in Group I and Group II. N=30+30

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>SD</th>
<th>Mean diff</th>
<th>'t' value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>7.17</td>
<td>1.206</td>
<td>3.800</td>
<td>13.680</td>
</tr>
<tr>
<td>Group II</td>
<td>10.97</td>
<td>0.928</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$t_{99}=1.67$ *significant.

Table IV: Association of level of behavioural response to pain among toddlers in Group I and Group II with their selected demographic variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group I (%)</th>
<th>Group II (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; M</td>
<td>≥ M</td>
</tr>
<tr>
<td>Age of the Child</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. 12-18 months</td>
<td>25.9</td>
<td>74.1</td>
</tr>
<tr>
<td>b. 19-24 months</td>
<td>33.3</td>
<td>66.7</td>
</tr>
<tr>
<td>c. 25-30 months</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>d. 31-36 months</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Male</td>
<td>31.6</td>
<td>64.8</td>
</tr>
<tr>
<td>b. Female</td>
<td>18.2</td>
<td>81.8</td>
</tr>
<tr>
<td>Child’s Recent Past Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. High resistance</td>
<td>0.0</td>
<td>100.0</td>
</tr>
<tr>
<td>b. Minimal resistance</td>
<td>36.4</td>
<td>63.6</td>
</tr>
<tr>
<td>c. Calm</td>
<td>36.4</td>
<td>63.6</td>
</tr>
<tr>
<td>Weight of the Child at the Time of Immunization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. More than 10 kg</td>
<td>37.5</td>
<td>62.5</td>
</tr>
<tr>
<td>b. Less than 10 Kg</td>
<td>14.3</td>
<td>85.7</td>
</tr>
</tbody>
</table>

*Fisher’s Exact test
Discussion

The present study revealed that the behavioral response to pain among toddlers during immunization procedure in Group I and Group II showed that, the Group I had moderate behavioral response to pain (83.3%) and 16.7% had severe behavioral response to pain while undergoing immunization, whereas Group II had severe pain (100%) during the immunization.

The above findings are consistent with a quasi experimental study conducted at pediatric surgery ward (6th floor, C block) of Advanced Pediatric Centre (APC), PGIMER, Chandigarh by James Jet et al (2012) The mean pain score was significantly less i.e. almost half with animated cartoon (2.26 ± 2.18) as compared to routine care (4.76 ± 2.08) at pre venipuncture. Similarly the mean pain score during venipuncture was significantly less with animated cartoon (6.24 ± 2.09) as compared to routine care (8.06 ± 1.70)(19).

The present study findings showed that there is no association between level of pain among toddlers in Group I and Group II and selected demographic variables (Fisher exact test, p>0.05).

The above findings are consistent with a quasi-experimental study was conducted on children of 3 to 6 years of age who were undergoing venipuncture in selected hospitals of Mangalore by MM Lobo and Umarani j (2012).The findings also revealed that there was no significant association between the level of pain and demographic variables(20).

Conclusion

Present study findings showed that, Distraction techniques like showing the animation video during immunizations are effective means for reduction of behavioural response to pain. It can also be used as a routine with immunisation so that children’s behavioural distress can be managed in an effective way. The study concluded that animation video is effective on behavioural response to pain in children receiving immunisation. It is important for the nurses, who administer immunisation, to alter the painful responses as much as possible. Nurses must meet the challenges in relieving response by distracting the children.

Acknowledgement: The investigator sincerely acknowledges the support given by Mrs. Shycil Mathew and Shanti Lobo for their timely support and smart guidance to complete the project. Sincere gratitude towards the study participants for their cooperation.

Financial support and sponsorship: Nil.

Conflicts of Interest: There are no conflicts of interest.

Ethical Clearance: Written informed consent was obtained from the parents of the children who brought their children for immunization at PHC. Ethical clearance was obtained from institutional ethics committee of CHCT, Mangalore.

Reference

1. Malathy S. Mothers knowledge on growth and development of their children between 0-3 years in selected rural area. Indian Journal of Nursing 2012 Jul;l(1):56-60.


Factors Related to Stunting in Toddlers Aged 6-24 Months

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Abstract

Stunting is one of worrying nutritional problems in Indonesia as its prevalence grows every year. The general objective of this study is to determine factors related to stunting. This study used cross-sectional approach conducted in Kendari City and Semarang City from April to December 2019. The population was children under two years old in Kendari City and Semarang City. Data were analyzed quantitatively, consisting of univariate and bivariate analysis with the help of SPSS. Data analyzed were presented in the form of table and description to discuss the results. The results showed that variables that were significantly correlated with stunting in this study were birth weight (p = 0.014), feeding (p = 0.014), mother’s height (p = 0.004), ANC (p = 0.008), mother’s education (p = 0.007), drinking water use (p = 0.0001), toilet use (0.047). To prevent stunting, it is suggested based on this study to focus on variables like feeding suitability, mother’s weight, ANC examination, drinking water use and toilet use.

Keywords: Stunting, toddler, birth weight, feeding.

Introduction

Stunting arises as one of prevalent nutritional problems in the world recently, especially in poor and developing countries. It becomes a problem because it elevates the risks of diseases and death ¹⁻³ and leads to suboptimal brain development, causing delayed and impaired mental and motor development. Children whose parents have short stature, whether both or one of them, are more likely to have similarly short stature compared to those whose parents have normal height ⁴. Parents with short stature, because of the genes in chromosomes that carry the short stature traits, will most likely pass those traits onto their children. However, in case the short stature is caused by nutritional or pathological problems, the traits will not be passed onto their offspring ⁵.

The determinants of stunting are complex. Stunting may be influenced by a number of factors such as Low Birth Weight⁶, education and economic level⁷, mother’s nutritional knowledge, and exclusive breastfeeding⁸. Stunting may also be attributable to sanitation, water, hygiene and environmental aspects ⁹. According to Palutturi, Syam, and Asnawi (2020), stunting can even be linked to political contexts. Health problems, stunting is one of them, are closely related to political, cultural and leadership problems ¹⁰⁻¹⁵.

Based on provincial and national data of 2013 Riskesdas, national prevalence of stunting is 37.2%, showing an increase compared to in 2010 (35.6%) and 2007 (36.8%). This rate consists of 18.0% very short stature and 19.2% short stature. In 2013, the very short stature rate saw a decrease from 18.8% in 2007 and 18.5% from 2010 while the short stature rate saw an increase from 18.0% in 2007¹⁶. In 2018 Riskesdas, a decrease of 6.4% was observed for 5-year period, bringing the number to 30.8% in 2018 from 37.2% in 2013. However, this decrease still fell short of 2019 RPJMN’s target of 28% for toddlers under two years old. The prevalence of stunting in Southeast Sulawesi is 34.5%.

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Materials and Method

In design, this was a cross-sectional study. It was conducted in Kendari City and Semarang City from April to November 2019. The population was children under two years old in both cities, with a sample size of 245 children (125 in Kendari City and 125 in Semarang City). The samples were collected using purposive sampling technique. Bivariate analysis was performed to determine the relationship between dependent variables and independent variables with Chi-square statistical test.

Results

Based on the nutritional status determination according to TB/U index, 42.9% of the children were stunted, 53.5% of them were male and 46.5% were female. In age group, 51.0% of them were aged 6-12 months. Only 2% of them were <20 years old, while 84.9% of them were 20-35 years old and 13.1% of them were >35 years old. 66.2% of the fathers had medium education, 11.4% had low education and 22.4% had high education. The majority of the family head were father with 85.7%.

Table 1: Study sample characteristics

<table>
<thead>
<tr>
<th>No.</th>
<th>Respondent Characteristics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>TB/U Nutritional Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stunting</td>
<td>105</td>
<td>57.1</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>140</td>
<td>42.9</td>
</tr>
<tr>
<td>2.</td>
<td>Genders</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>131</td>
<td>53.5</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>114</td>
<td>46.5</td>
</tr>
<tr>
<td>3.</td>
<td>Age Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6-12 months old</td>
<td>125</td>
<td>51.0</td>
</tr>
<tr>
<td></td>
<td>12-24 months old</td>
<td>120</td>
<td>49.0</td>
</tr>
<tr>
<td>4.</td>
<td>Maternal Age Category</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt; 20 years old</td>
<td>5</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>20-35 years old</td>
<td>208</td>
<td>84.9</td>
</tr>
<tr>
<td></td>
<td>&gt; 35 years old</td>
<td>32</td>
<td>13.1</td>
</tr>
<tr>
<td>5.</td>
<td>Father’s Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>28</td>
<td>11.4</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>162</td>
<td>66.2</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>55</td>
<td>22.4</td>
</tr>
<tr>
<td>6.</td>
<td>Family Head</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Father</td>
<td>210</td>
<td>85.7</td>
</tr>
<tr>
<td></td>
<td>Mother</td>
<td>7</td>
<td>2.9</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>28</td>
<td>11.4</td>
</tr>
</tbody>
</table>

Table 2: Factors related to stunting in toddlers

<table>
<thead>
<tr>
<th>Variables</th>
<th>Stunting Status</th>
<th>Total</th>
<th>pv</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal</td>
<td>Stunting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Birth Weight</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BBLR (LBW)</td>
<td>9</td>
<td>34.6</td>
<td>17</td>
</tr>
<tr>
<td>Normal</td>
<td>131</td>
<td>59.8</td>
<td>88</td>
</tr>
<tr>
<td>Feeding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid foods</td>
<td>16</td>
<td>80.0</td>
<td>4</td>
</tr>
<tr>
<td>Formula/ASI</td>
<td>124</td>
<td>55.1</td>
<td>101</td>
</tr>
</tbody>
</table>
In Table 2, out of 218 samples, 88 (40.2%) of them had normal birth weight but stunted and 131 (59.8%) of them had normal birth weight but not stunted. Out of 20 samples, 4 (20.0%) of them were given solid foods and stunted and 16 (80.0%) of them were given solid foods but not stunted.

Out of 221 mother’s height samples, 88 (39.8%) of them had normal height with stunting status, and 133 (60.2%) of them had normal height without stunting status. Meanwhile, out of 24 short stature mother samples, 7 (29.3%) of them were normal while 17 (70.8%) of them were stunted. Out of 159 ANC samples, 78 (49.1%) of them received inadequate ANC and were stunted and 81 (50.9%) of them received inadequate ANC but not stunted. Out of 54 high mother’s education samples, 13 (24.1%) of them were stunted and 41 (75.9%) of them were normal. Out of 145 protected water samples, 51 (35.2%) of them were stunted and 94 (64.8%) were normal. Out of 236 samples, 104 (44.1%) of them used gooseneck toilet or similar and suffer from stunting and 132 (55.9%) of them used gooseneck toilet or similar and were free from stunting.

### Discussion

**Relationship between Birth Weight and Stunting Status:** The statistic test using Chi square obtained a p-value of 0.014, smaller than the alpha (p<0.05), indicating a relationship between birth weight and stunting status. This was in line the study by 17, expressing that toddlers with low birth were at increased risk for stunting.

The study by Nasution et al. on low birth weight (LBW) with stunting in children aged 6-24 monthsfound that there was a significant relationship between LBW and stunting incidents in children aged 6-24 months (OR=5.60; 95% CI:2.27-15.70).

LBW infants also experienced digestive tract disorders because the digestive tract had not functioned properly, as in less able to absorb fat and digest protein and cause a lack of reserves of nutrients in the body. Consequently, it would impair the growth of LBW babies and if this continued unchecked, coupled with inadequate feeding, multiple infection episodes, and poor health care, it might lead to stunting.
Relationship between Feeding and Stunting Status: Table 2 shows that out of 20 samples, 4 (20.0%) of them received solid foods and suffered from stunting and 16 (80.0%) of them received solid foods and did not suffer from stunting. Furthermore, out of 218 exclusive formula/breastfeeding samples, 124 (55.1%) of them were normal and 101 (44.9%) of them were stunted.

Based on the chi-square test, there was no relationship between energy sufficiency level and stunting incidents in children under five both in rural or urban areas, while zinc and iron sufficiency levels were observed to have a significant relationship. In rural areas there was a significant relationship between protein and calcium sufficiency and stunting incidents in children under five, evidenced by a p-value of $<\alpha$ (0.05). However, for urban areas the p-value was $>\alpha$ (0.05), meaning that protein and calcium sufficiency levels were not correlated with stunting incidents in children under five.

This was in line with the study by Salsa (2016) stating consumption of foods containing vitamin C affected stunting incident. Vitamin C is important for forming collagen and protein structure. Collagen is needed for the formation of bones and teeth and scar tissue. Vitamin C is also instrumental in boosting immunity against infections. Vitamin C is needed in the growth process through its role in the synthesis of collagen, proline hydroxylation and lysine conversion to hydroxyproline.

Relationship between ANC and Stunting Status: Table 2 shows that out of 159 inadequate ANC samples, 78 (49.1%) of them suffered from stunting and 81 (50.9%) did not suffer from it. Furthermore, out of 86 adequate ANC samples, 59 (68.6%) of them were normal and 27 (31.4) of them were stunted. The statistic test using Chi-square obtained a p-value of 0.007, smaller than the alpha (p<0.05), indicating there was a relationship between ANC and stunting status.

This was also in line with the other study on risk factors of child stunting, one of which was ANC visits. ANC visits made regularly can detect pregnancy risks early in 18 mothers, especially ones related to nutritional status (Ni’amah, 2014). In this study it was found that mothers who made only one ANC visit (fewer than the minimum standard of four times) had a risk of having a stunted toddler 2.4 times greater than mothers who made ANC visit according to the standard.

Relationship between Mother’s Height and Stunting Status: Parents’ height is closely related to the child’s physical growth. Mothers with short stature are one of factors correlated significantly with stunting incidents. This finding was in line with the study by Rahayu (2011) revealing that a child born from a mother and father with short stature was at risk for stunting. One or both parents with short stature due to pathological condition (such as growth hormone deficiency) possess genes in chromosomes that carry short height traits, effectively increasing the probability of the child inheriting said genes and suffering from stunting.

Another study concluded that parents with short stature, low education levels and low income are risk factors associated with stunting incidents in children under five. Other study also stated that genetic factors in the mother, namely height, have a strong correlation with stunting incidents in children.

Relationship between Mother’s Education Level and Stunting Status: The education level is associated with the level of difficulty for mothers to access and receive information about nutrition and health from external sources. A mother with higher education level receives information from external sources with more ease, compared to a mother with lower education level. The level of education of the majority of families of stunted toddlers fell into the low category, which was mainly due to economic condition, holding them back from continuing to higher education levels. In fact, higher education levels were nearly out of question when they struggled to provide foods with complete nutrition.

The statistic test using Chi-square obtained a p-value of 0.007, smaller than the alpha (p<0.05), indicating there was a relationship between mother’s height and stunting status. It showed that mother’s education level was not a determinant factor in stunting incidents. This was in line with the study by Ni’mah and Muniroh (2015) stating that mother’s education level was not correlated with stunting incidents in children under five.

This was also in line with the study by Astuti (2013) revealing that there was no correlation between mother’s education and stunting incidents. Similar results were also obtained by Ni’mah and Muniroh (2016) in their study.

Relationship between Drinking Water Use and Stunting Status: Clean drinking water source is an important element for health and helps decrease the risk
of various diseases such as diarrhea, cholera, and typhus. Children are a vulnerable subject for infectious diseases since their immune system is naturally weak. Mortality and morbidity in children are generally associated with contaminated drinking water sources and poor sanitation. Several studies in many countries showed that drinking water quality is positively correlated with the reduction in diarrhea incidents and mortality in children (Adeware, et. al. 2011).

Protected drinking water sources which are the manifestation of healthy environmental sanitation indirectly influences toddler’s health which ultimately affects their nutritional status or stunting incidents. Nutritional problems, in addition to being caused by a lack of nutrient intake, are also caused by poor environmental sanitation, in this case drinking water sources and personal hygiene, which facilitate the emergence of infectious diseases. This was in line with the study by Zairinayanti and Purnama Rio (2019), revealing that there was a relationship between hygiene and environmental sanitation and stunting incidents.

Relationship between Toilet Use and Stunting Status

Community-led total sanitation program (STBM) is a national policy based on the Decree of the Minister of Health No. 852/Menkes/IX/2008, which was then extended with Permenkes No. 3 of 2014. The objective of this program is to realize hygienic and sanitary community behavior independently in order to improve public health to the highest level possible. The implementation of STBM relies on 5 principles; Stop Open Defecation; Use Soap to Wash Hands; Household Drinking Water and Food Management; Household Waste Management; and House Wastewater Management.

Conclusions

Based on the results and discussion, the conclusion drawn is that in this study, factors that are significantly related to stunting incidents are birth weight, feeding, mother’s height, ANC, drinking water consumption and toilet use. The researchers suggest that in order to prevent stunting, factors such as feeding, mother’s height, ANC, drinking water consumption and toilet use need closer attention.

Ethical Clearance: Taken from institution ethical clearance.

Source of Funding: Self
Conflict of Interest: Nil

References


Frequency of Occurrence of Different Kennedy Classified Cases in College of Dentistry (Iraq)

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¹M.Sc. Lecturer, Department of Prosthodontics, ²B.D.S., Department of Basic Science, ³B.D.S., Department of Prosthodontics, College of Dentistry, University of Babylon.

Abstract

The Aim: To assess the incidence of Kennedy’s classification among partially edentulous individuals along with its correlation with age and gender.

The Method: The subject in this study was consisted of 191 patients. All patients seeking for replacement of missing teeth were included in the study. The data related to partial edentulism was recorded in a self-designed proforma. The clinical data were summarized, frequencies and percentages as appropriate in association with age, gender. Kennedy’s classification was used to determine the pattern of partially edentulous arches.

The Result: The occurrence of Kennedy Cl. III partial edentulism was 17.8% in the maxillary arch and 9.42% in the mandibular arch. Followed by Cl. II in both the maxillary and mandibular arch, while cl. IV was the least among the other classes. The cl.III has the highest prevalence in group III patients. Cl. I and II have the highest incidence among group IV patients. The number of female was more than male and the highest frequency of cl. II was for females, followed by cl. III, while the lowest cases was cl. IV, for males, the most frequent was cl.II followed by cl. IV.

The Conclusion: There is an increase in Cl.I and II and a decrease in Cl. III and IV with an increase in age. The prevalence of Cl. III was predominant among younger population, whereas in group IV Cl.I was predominant.

Keyword: Frequency, occurrence, different, kennedy, dentistry.

Introduction

Psychological, social, and biologic levels of the oral health-related quality of life are affected by tooth loss, the people can be early seeking for treatment significantly if received good education which help them giving more attention to signs of tooth loss associated diseases thus reduced the degree of tooth loss in different countries in last periods¹-³. The tooth loss across all ages have been observed by Bruce⁴ who found that the major cause of losing tooth was the caries (83%) then the periodontal disease (17%). The improvement in the oral health of the population can be reflected by the reduction in edentulous people number⁵-⁶, and also it was mean that preventive measures by the health care system was successful¹,⁷ Recently, there were a decrease in edentulous patient’s number is predicted by trends in dental health care that support natural dentition preservation.⁸ In maxillary and mandibular arches, more than 65000 potential mixtures of partial edentulism pattern were found, therefore, the classification of partially edentulous arches that have common characteristics was reasonable to enable the communication between the various dental professionals⁹-¹² The partially edentulous arches can be classify according different classifications to distinguish probable combinations of tooth to ridges, and also loss of teeth patterns is a good pointer for the oral hygiene levels, the management and the magnitude of dental health problems, dental health awareness, and the edentulous space was used to identify tooth loss, which is a space in the dental arch naturally full by one tooth or more, for different reasons it may be
Presently, the best mostly accepted classification for partially edentulous arches was the Kennedy’s classification because it allow the recognition of prosthesis support, direct visualization, also the valuation of the design of removable partial denture characters. Presently, the best mostly accepted classification for partially edentulous arches was the Kennedy’s classification because it allows the recognition of prosthesis support, direct visualization, also the valuation of the design of removable partial denture characters.13-15 In different countries the tooth loss pattern has been assessed in various populations.14-19

In males a greater incidence of edentulism has been found by Hoover and McDermount 20 than females, on the other hands, Marcus et al. 21 found that there was no relation between the gender and the edentulism prevalence. The health care epidemiological information and its associated concerns are important for designing health care in the future.22 As epidemiologic findings on the loss of tooth and the edentulism were differ significantly in prevalence between countries and between geographic areas within countries.23-25

The aim of the study: The present study aimed to evaluate the incidence of Kennedy’s classification between partially edentulous individuals along with its correlation with age and gender, and because there are no available studies (to our knowledge) that have investigated the prevalence of partial edentulism among subjects in Babylon region, this would be of valuable information to oral health planners for proposing strategies helping in the development of dental health care management in Iraq.

Patients and Method

This cross-sectional study was approved by the Research Committee at the Faculty of Dentistry in Babylon University. The survey was conducted in Prosthodontics Department at the College of Dentistry/Babylon University/Hilla/Iraq. The study was conducted in patient reported to outpatient section of the college. The data collections were carried out during the period of October 2016 – May 2017 for patients requiring removable partial dentures. The subject in this study was consisted of 191 patients ( 90 male and 101 females). All patients seeking for replacement of missing teeth were included in this study. All the patients attended to the college clinics were surveyed and the cases for this study are selected according to the certain criteria’s. The inclusion criteria consisted of patients from both genders, above the age of 20 years, having partially edentulous areas in either or both arches. The Kennedys modification areas were not included to avoid the complexity. Patients with an only missing third molar, unerupted or congenitally missing teeth, root tips, and loose teeth that were indicated for extraction were not included in the study. All relevant data related to partial edentulism was recorded in a self-designed proforma. The clinical data were summarized, frequencies and percentages as appropriate in association with age, gender. Kennedy’s classification was used to determine the pattern of partially edentulous arches. Modification areas were not included in the assessment to avoid complexity.

Result

Prevalence and pattern of partial edentulism among dental patients attending College of Dentistry, Babylon University were studied. The mean age of the selected patients was 33.3 years. The table (1) show the age-group distribution. The results in table (2) and fig. (1) showed that the occurrence of Kennedy Class III partial edentulism was 17.8 % in the maxillary arch and 9.42 % in the mandibular arch. Followed by Class II in both the maxillary and mandibular arch with an average of 11.51% in the maxillary arch and 14.65% in the mandibular arch, while class IV was the least among the other classes in both the maxillary and mandibular arch with an average 10.99%. Based on these results, Kennedy’s Class III was the most prevalent partially edentulous pattern 27.22% among the maxillary and the mandibular arch.

Distribution of different classes in the age groups is shown in table 3 and figure 2. The results reveal that class III has the highest prevalence in group III (40–49 years) patients. With increasing age, a transition of bounded saddles into free end saddles was found. Classes I and II have the highest incidence among group IV patients (40–49 years), as shown in Figure 3. It is obvious from table (3) that the highest number of patients was in group III (40–49) years in both arches.

In this study the number of female was more than male and the highest frequency of Kennedy cl. II was for females, followed by cl. III, while the lowest cases was cl. IV, for males, the most frequent was cl.II followed by cl. IV (table 4 and fig. 3).
Table 2: Incidence of different Kennedy’s classes among the maxillary arch and the mandibular arch.

<table>
<thead>
<tr>
<th>Arch</th>
<th>Cl. I n (%)</th>
<th>Cl. II n (%)</th>
<th>Cl. III n (%)</th>
<th>Cl. IV n(%)</th>
<th>Total n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maxillary</td>
<td>22 cases (11.51 %)</td>
<td>22 cases (11.51 %)</td>
<td>34 cases (17.8 %)</td>
<td>21 cases (10.99 %)</td>
<td>99 cases (51.83 %)</td>
</tr>
<tr>
<td>Mandibular</td>
<td>25 cases (13.08 %)</td>
<td>28 cases (14.65 %)</td>
<td>18 cases (9.42 %)</td>
<td>21 cases (10.99 %)</td>
<td>92 cases (48.16 %)</td>
</tr>
<tr>
<td>Total</td>
<td>47(24.59%)</td>
<td>50(26.16%)</td>
<td>52(27.22%)</td>
<td>42(21.98%)</td>
<td>191</td>
</tr>
</tbody>
</table>

Table 3: Frequency of different classes of partial edentulism according to age:

<table>
<thead>
<tr>
<th>Age Gr.</th>
<th>Cl. I (%)</th>
<th>Cl. II (%)</th>
<th>Cl. III (%)</th>
<th>Cl. IV (%)</th>
<th>Total (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G.I</td>
<td>0 case</td>
<td>0 case</td>
<td>4 cases (2.09 %)</td>
<td>19 cases (9.94 %)</td>
<td>23</td>
</tr>
<tr>
<td>G.II</td>
<td>5 cases (2.61 %)</td>
<td>17 cases (8.9 %)</td>
<td>15 cases (7.85 %)</td>
<td>2 cases (1.04 %)</td>
<td>39</td>
</tr>
<tr>
<td>G.III</td>
<td>18 cases (9.42 %)</td>
<td>18 cases (9.42 %)</td>
<td>20 cases (10.47 %)</td>
<td>13 cases (6.8 %)</td>
<td>69</td>
</tr>
<tr>
<td>G.IV</td>
<td>16 cases (8.37 %)</td>
<td>11 cases (5.75 %)</td>
<td>8 cases (4.18 %)</td>
<td>5 cases (2.61 %)</td>
<td>40</td>
</tr>
<tr>
<td>G.V</td>
<td>5 cases (2.61 %)</td>
<td>3 cases (1.57 %)</td>
<td>8 cases (4.18 %)</td>
<td>3 cases (1.57 %)</td>
<td>19</td>
</tr>
<tr>
<td>G.VI</td>
<td>1 case (0.52 %)</td>
<td>2 cases (1.04 %)</td>
<td>0 case</td>
<td>1 case (0.52 %)</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 4: Distribution of study subjects according to gender and type of edentulism:

<table>
<thead>
<tr>
<th>Gender</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>22 cases</td>
<td>25 cases</td>
<td>22 cases</td>
<td>22 cases</td>
<td>91</td>
</tr>
<tr>
<td>Female</td>
<td>27 cases</td>
<td>31 cases</td>
<td>30 cases</td>
<td>13 cases</td>
<td>100</td>
</tr>
</tbody>
</table>

Fig. 1: Incidence of different Kennedy’s classes among the maxillary and mandibular arches.
Discussion

It is increasingly recognized that the impact of disease on quality of life should be taken into account when assessing health status. It is likely that tooth loss in most cases being a consequence of oral diseases which affects the oral health related quality of life. The main aim in using a classification for RPDs is to facilitate the description of partially edentulous cases. In the current study, Kennedy classification was selected because it simplifies the description of partially edentulous cases, permits immediate visualization of the partially edentulous arch, provides a logical way to display the problems of design, and to simplify the application of basic principles of partial denture design. The present study was initiated to assess the prevalence and pattern of partial edentulism among dental patients attending the College of Dentistry, Babylon University, Iraq. The findings of the present study showed that the frequency of partial edentulism in the maxillary arch was higher than the partial mandibular at almost equality in the prevalence of Kennedy’s classification in both arches edentulism among the study population, and this result was disagree with the study of Curtis et al. who reported that mandibular removable partial dentures are more common than maxillary removable partial dentures, and that the class I mandibular RPD is the most prevalent type of RPD for either dental arch.

In this study Kennedy’s Class III was found to be the most prevalent pattern of partial edentulism and this result was agree with the study of Hatim et al. which state that the Kennedy Cl.III was the most common pattern (57.14%) in a sample of the Iraqi population, and with the study of Benin, Ehikhamenor, et al. which state that the most commonly restored edentulous area was Kennedy’s class III (57.3%). The data of present study suggesting predominance on class III pattern of partial edentulism may be due to the fact that a higher frequency of younger age groups was encountered, whereas a higher frequency of older population was seen in other studies, and the study reported the increased awareness of among the younger populations with large number of younger groups reporting to the prosthodontic department for replacing missing teeth which that tooth loss may be due to the fact that the first molar is the first permanent tooth to erupt into the oral cavity, having a higher caries percentage and a higher chance of the tooth being extracted prior to the anterior teeth and/or they have greater surface area for caries attack because
at this early age the children cannot perform adequate oral hygiene maintenance and their low socioeconomic status leading to early tooth loss.

**Conclusion**

The present study showed that, among dental patients attending outpatient clinics, College of Dentistry, Babylon University, there is an increase in Cl.I and II Kennedy classification and a decrease in Cl. III and IV with an increase in age. The prevalence of Class III was predominant among younger population of 40–49 years, whereas in group IV (50-59) years Cl.I was predominant. It can be stated that the need for prosthodontics care is expected to increase with age, and hence, more efforts should be made for improving dental education and motivation among patients in Hilla region.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Dentistry and all experiments were carried out in accordance with approved guidelines.

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Nurses’ Knowledge toward Traumatic Head Injury During Golden Hour

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Abstract

Background: Nurses have a central role in management critical ill patients, not only to save their life but to improve their outcomes. Also, there is no safe practice unless the nurses had enough knowledge.

Objectives: The objective of this study was to assess nurses’ knowledge toward traumatic head injury during golden hour neurosurgical hospital, and to find out relationships between their demographics and total knowledge.

Method: A descriptive study using a purposive sample (non-probability) was used to survey 25 nurses who met the sampling criteria in one main neurosurgical hospital in Baghdad city to assess their knowledge toward traumatic head injury during golden hour. The official permission begin before study starting. The study starting from June 15th July 14th 2019. Based on comprehensive literature, the tool of study constructed by the researcher and tested for validity and reliability.

Results: The majority of the study sample 64% were (20-24) years old. Most of them were female (80%), and (52%) was married. Also, most study samples had high school nursing graduation (80%). Regarding the workplace, most of the study sample (64%) works in Neurosurgical ICU. Regarding years of experience, half of the study sample (52%) had less than three years of experience in the current workplace and more than one-third (36%) had total years of employment in nursing between 9 to 12 years. The majority of the study sample (52%) has participated in training courses about traumatic head injury and (64%) was the day shift of work. The total mean of the score of nurses’ knowledge was fair (0.42).

Conclusion: Despite the total nurse’s knowledge was fair 0.34-0.67, the majority of them were junior, graduation from secondary school nursing, and had poor knowledge toward traumatic head injury during golden hour. On the other hand, 48% of nurses not participated in continuous education lectures about traumatic head injury. Regarding these results, researchers recommend encouraging nurses who had a diploma and bachelor in nursing to work in critical care units at neurosurgical hospital and update continuous education program lectures to cover all nurses to improve their knowledge about traumatic head injury.

Keywords: Traumatic head injury, Nurse, Knowledge, Golden Hour.

Introduction

In a critical care unit, where the patient takes the closely monitoring and advance health care by a multi-disciplinary team, nurse have a central role, in the identification of patient problems, the ability to solve problems, anticipating and preventing possible complications. Therefore, the development and enhancement of nurses knowledge are necessary to promote clinical judgment[1]. The enhancement of the nurses’ knowledge and skill in the care of the patients with a traumatic head injury, is the most important way to promote their patients’ outcomes. So, the enhancement includes, well-structured of evidence-
based information and continuous practice in the hospital area\cite{2}. Kinds of literature mentions, knowledge base and learning in nursing are long-life aspects and essential to maintaining not only their competencies also encouraged to improve their clinical practice. Indeed, the importance of safe nurses’ knowledge level and the significance of educational components programs in the improvement of their knowledge \cite{3,4}. Works of literature discussed the factors that can effects patients outcomes after traumatic brain injury, one of these factors is how the patients managed at injury moment and the definite care does not include only in the field of injury, may continue at a hospital\cite{4,5}. In Iraq, the country that fought terrorism on behalf of the world, in the last two decades, the incidence of traumatic head injury increase to peak since the first gulf war. Traumatic head injury increase, related to many factors including, terrorism attacks, uses of not programmed weapon, and lack of road safety \cite{6}. According to the Iraqi Medico-Legal study report, fatal head injuries have high percents among medico-legal deaths and 24\% of cases death is delayed after different periods from the admission to the hospital \cite{7}. Basrah, one of the largest cities in the south of Iraq, the mortality rate was significant in-hospital, even head injury was mild \cite{6}. Despite much literature, well-known nurses’ knowledge in a critical care setting in Iraq, the little study focused on the management of traumatic head injury and there is no study to assess nurses’s knowledge toward traumatic head injury during the golden hour \cite{8}.

**Material and Method**

**Design:** This is a descriptive study that was conducted to describe nurses’ knowledge toward traumatic head injury during golden hour using a questionnaire that contains questions based on the best available information.

**Ethical Approval:** This study was approved by the Institutional Ethics Committee, and The IRB was obtained from the University of Baghdad and the Ministry of Health, Directorate of Al Rusafa Health Administration in Baghdad city. The purpose of the study was explained to the nurses who work in the ICU and emergency unit in the neurosurgical hospital. The informed consent was reviewed and permitted by the Center of Staff Development and Scientific Research. Every participant had the right to withdraw and refuse participation from the study at any time without any penalties.

**Study sample:** A non-probability (purposive) sample technique was used to collect the data. The populations are nurses who work in ICU and emergency in Neurosurgical hospital. The target population that provided the sample data was a group of nurses who met the sampling criteria. The official permission begin before study starting. The study starting from June 15th July 14th 2019. All male and female nurses with different educational levels who work in ICU and emergency were included in this study. Also, nurses who work in a day and night shifts were included in this study. The total sample size was 25 who agreed to participate in this study, the completed survey was included in the statistical analysis.

**Instrument:** Tools constructed by the researcher based on deep literature and standard textbooks in nursing. The validity of instruments obtained via 13 experts. The reliability of this tool shows was used test-retest, Cronbach’s alpha was 0.81. This tool consists of 54 questions regarding traumatic head injury during golden hour in Neurosurgical critical care units. The total score for the tool measured based on the mean of the answers(poor knowledge, fair knowledge, and good knowledge). The code of correct answer was (1) for true and (0) for a false answer.

Also, the first part of questionnaire included nurses’ demographics: age, gender, level of education, years of experience in the ICU, total years of employment in nursing, a shift of work, and participation in continuous education lectures and seminars about traumatic head injury.

The second part of questionnaire contain five domains of knowledge include questions (anatomy and physiology of head and brain=9 questions, physiology of intracranial pressure, cerebral perfusion pressure and blood pressure=16 questions; primary and secondary survey domain=10 questions; Fluid supply= 7 questions; and information about golden hour=12 questions).

**Data Analysis:** The statistics done by the Statistical Package for the Social Sciences (SPSS) version 24 software was used to perform the statistical analysis that included descriptive statistics (frequency, percentage, and mean of score) and inferential statistics (standard deviation and independent t-test and ANOVA).

**Findings:** In the Current study, twenty-five nurses have been studied in critical care units, were data analysis for the demographic characteristics’ and association for
all participants. Regarding descriptive data analysis were showed in table 1, the mean of nurses’ age was 25.1 and the standard deviation was 6.77 with a range of 20 to 39 years old. More than three-quarters of study samples were female gender accounts 80% and 20% were males. Concerning marital status, the majority of participants were married 52% and single accounts 48%. Regarding educational status, 84% of study samples belonged to high school nursing graduation, 12% were medical institute graduation, and 4% college of nursing graduation. According to Neurosurgical hospital distribution, the majority of study participants 64% was work in the intensive care unit and 36% work in the emergency unit. More than two-third 88% of the study sample was day shift, night shift accounts 12%. In regard to years of experience in the current place, 52% of the study sample was spent less than three years, 24% spent three to six years and 24% spent more than six-year. Also, total years of employment in nursing accounts 36% of study samples spent nine to twelve years as total years in nursing. Regarding participation in the training course, more than half the study subject 52% participated in training courses, and 48% have no participation in training courses.

Table 2 showed the level of assessment for study sample knowledge, 52% of study sample mean of the score was between 0.00 to 0.33, accounts poor knowledge, 36% was between 0.34-0.67 accounts fair knowledge and 12% was between 0.68-1.00 accounts good knowledge.

Table 3 showed nurses’ age has significance association (F =6.850, p=0.003)their knowledge. Regarding marital status, there is a significant association (F=6.600, p=0.004) between nurses’ educational status and their knowledge. The Nurses who reported for years’ experience in the current place have no significance (F=0.827, p=(0.642 with their knowledge. Also, total years of employment in nursing have no significance association (F=0.561, p=0.845) with their knowledge.

Finally, the result in table 4, tested by independent t-test shows, study sample gender have significance association (t=5.593, p=0.000) with their knowledge. However, there is no significant association (t=-0.482, p=0.634) between nurses’ marital status and their knowledge toward traumatic head injury during the golden hour. Also, The result indicated there is no significant association (t=0.703,p=0.439) between nurses working in emergency or intensive care unit and their level of knowledge. According to the work shift, there are no significant correlation (t=-2.016, p=0.56) nurses who work in the day or night shift and their knowledge. Whatever, the analysis shows nosignificant differences(t=0.181, p=0.858) between nurses who attended the training course and their level of knowledge.

**Table (1): The table shows the distribution of the study sample regarding their demographics characteristics. N=(25)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency F</th>
<th>Percent %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age groups</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS±Sd* 25.1±6.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(20-24)</td>
<td>16</td>
<td>64.0</td>
</tr>
<tr>
<td>(25-29)</td>
<td>4</td>
<td>16.0</td>
</tr>
<tr>
<td>(30-34)</td>
<td>1</td>
<td>4.0</td>
</tr>
<tr>
<td>(35-39)</td>
<td>4</td>
<td>16.0</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>5</td>
<td>20.0</td>
</tr>
<tr>
<td>Female</td>
<td>20</td>
<td>80.0</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>12</td>
<td>48.0</td>
</tr>
<tr>
<td>Married</td>
<td>13</td>
<td>52.0</td>
</tr>
<tr>
<td><strong>Educational status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary school nursing</td>
<td>21</td>
<td>84.0</td>
</tr>
<tr>
<td>Diploma</td>
<td>3</td>
<td>12.0</td>
</tr>
<tr>
<td>Bachelor</td>
<td>1</td>
<td>4.0</td>
</tr>
<tr>
<td><strong>Years of Experience in the current place</strong></td>
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<td></td>
</tr>
<tr>
<td>Less than 3 years</td>
<td>13</td>
<td>52.0</td>
</tr>
<tr>
<td>3-6 years</td>
<td>6</td>
<td>24.0</td>
</tr>
<tr>
<td>More than 6 years</td>
<td>6</td>
<td>24.0</td>
</tr>
</tbody>
</table>
### Table (2): Descriptive statistics Regarding levels of Assessment of Studied Sample knowledge N=25:

<table>
<thead>
<tr>
<th>Variables</th>
<th>N=25</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Groups</td>
<td></td>
<td>Between Groups</td>
<td>3</td>
<td>0.175</td>
<td>22.332</td>
<td>0.000</td>
</tr>
<tr>
<td>Educational Status</td>
<td></td>
<td>Between Groups</td>
<td>2</td>
<td>0.006</td>
<td>0.204</td>
<td>0.817</td>
</tr>
<tr>
<td>Years of Experience in the current workplace</td>
<td></td>
<td>Between Groups</td>
<td>22</td>
<td>0.0310</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Years of Employment in Nursing</td>
<td></td>
<td>Between Groups</td>
<td>22</td>
<td>0.040</td>
<td>1.521</td>
<td>.2340</td>
</tr>
</tbody>
</table>

### Table (3): Association between Demographic characteristic and Studied Sample knowledge scores:

<table>
<thead>
<tr>
<th>Levels of Assessment</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor: (0.00-0.33)</td>
<td>13</td>
<td>52.0</td>
</tr>
<tr>
<td>Fair(0.34-0.67)</td>
<td>8</td>
<td>32.0</td>
</tr>
<tr>
<td>Good (0.68-1.00)</td>
<td>4</td>
<td>16.0</td>
</tr>
<tr>
<td>MS±SD</td>
<td>0.42± 0.235</td>
<td></td>
</tr>
</tbody>
</table>

### Table (4): Association between demographic Characteristics (gender, marital status, work field, the shift of work, and participations in the training course) and studied sample knowledge scores

<table>
<thead>
<tr>
<th>Variables</th>
<th>N=25</th>
<th>Mean</th>
<th>t- value</th>
<th>df</th>
<th>Sig*. 2 tailed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>65</td>
<td>5.593</td>
<td>23</td>
<td></td>
<td>0.000</td>
</tr>
<tr>
<td>Female</td>
<td>33</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>38</td>
<td>-0.482</td>
<td>23</td>
<td></td>
<td>0.634</td>
</tr>
<tr>
<td>Married</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work Field</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ER</td>
<td>43</td>
<td>0.703</td>
<td>23</td>
<td></td>
<td>0.489</td>
</tr>
<tr>
<td>ICU</td>
<td>38</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shift of work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day</td>
<td>37</td>
<td>-2.016</td>
<td>23</td>
<td></td>
<td>0.056</td>
</tr>
<tr>
<td>Night</td>
<td>57</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation in the training course</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>40</td>
<td>0.181</td>
<td>23</td>
<td></td>
<td>0.858</td>
</tr>
<tr>
<td>No</td>
<td>39</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sig.=significance <0.005, NS= Non significance >0.005
Discussion

In the current study, the average of nurses’ knowledge between 0.34 to 0.67 respectively. Despite the nurses underline fair knowledge and more than half participate in training courses, secondary school nursing graduation, but 52% of having poor knowledge regarding level of assessment. The rationale underlines just how important educational status in nurse’s knowledge about head injury in critical care units. Also, the result shows a significant association between age groups and gender with their level of knowledge assessment. These results disagree with Kiewiet, where she studied professional nurses’ knowledge and clinical practice regarding traumatic head injury, she found there is no significant correlation between age groups and gender and level of nurses knowledge [9]. Regarding nurses years of experience in nursing and in the current workplace, there is no significance with their knowledge. These Results share a number of similarities with Ahmed et al. findings[10], they found the years of experience had no effect on nurses’ knowledge toward trauma patients during the golden hour. In regard to the workplace, the analysis did not confirm any significant differences between nurses who work in emergency or works in the intensive care unit and their knowledge. The reason for these results, there are no specific nursing guidelines to manage patients with a traumatic head injury during golden hour in neurosurgical critical care units.

Conclusion

Despite the total nurse’s knowledge was fair 0.34-0.67, the majority of them were junior, graduation from secondary school nursing, and had poor knowledge toward traumatic head injury during golden hour. On the other hand, 48% of nurses not participated in continuous education lectures about traumatic head injury. Regarding these results, researchers recommend encouraging nurses who had a diploma and bachelor in nursing to work in critical care units at neurosurgical hospital and update continuous education program lectures to cover all nurses to improve their knowledge about traumatic head injury during golden hour.

Conflict of Interest: Not declared

Source of Funding: The researchers have no funding support

Ethical Clearance: This study was approved by the Institutional Ethics Committee, and The IRB was obtained from the University of Baghdad and the Ministry of Health, Directorate of Al Rusafia Health Administration in Baghdad city.

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5. Prema TP, Graicy KF. Essential Neurological and Neurosurgical Nursing. New Delhi; Jaypee brothers medical publishers. 2013; (4)
Relation of UTI with Type 2 Diabetes and Pregnancy in Women Attended Obstetrics, Gynecology and Pediatric Hospital in Kirkuk City

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Abstract

The study was conducted in the city of Kirkuk in the period from October 2019 to March 2020, which included 100 pregnant women with type 2 diabetes who attended obstetric, gynaecology and paediatric hospital in Kirkuk city and 100 people intact and without any chronic disease. The study included the laboratory examination of the reactions samples, where close quantities of midstream urine were collected for both groups. After collecting the calories, the calories were examined microscopically, and then the reactions were transplanted into the available culture media to isolate the aetiology of urinary tract infections such as blood agar and MacConkey agar, and the CLED agar to isolate and diagnose bacteria of all kinds. In addition, the sensitivity test for antibiotics was applied by the feeding medium where the method were relied upon Global standard bacteriological culture procedure, isolation and diagnosis by biochemical tests. Among diabetes mellitus patients included in this study, 80% were positive for UTI patients, while 20% were negative for UTI. According to the distribution of the isolated bacteria among the study groups, the common isolated bacteria among DM was E. coli which constituted 26.36% followed by K. pneumoniae which constituted 17.27%, S. aureus and P. mirabilis which constituted 8.18% and the lowest percentage was Enterobacter cloacae for 1.81%. In this study S. aureus showed high rate of sensitivity to ciprofloxacin and oxacillin (88.23%) while it was resistant to ampicillin and lincomycin with rate of 100%. Staphylococcus epidermidis showed high rate of sensitivity to tobramycin and oxacillin (92.85%) while it was resistant to ampicillin, lincomycin and oxacillin (100%) Escherichia coli showed high rate of sensitivity (93.02%) to ceftazidim and it was 100% resistant to oxacillin and lincomycin. Klebsiella pneumoniae showed high rate of sensitivity (81.48 %) to amoxiclave and it was resistant to ampicillin, tetracycline, erythromycin, oxacillin and lincomycin (100%).

Keywords: UTI; Type 2 Diabetes; Pregnancy.

Introduction

Urinary tract infections (UTIs) are frequently encountered in pregnant women. Pyelonephritis is the most common serious medical condition seen in pregnancy. Thus, it is crucial for providers of obstetric care to be knowledgeable about normal findings of the urinary tract, evaluation of abnormalities, and treatment of disease (1). During pregnancy, urinary tract changes predispose women to infection. Ureteral dilation is seen due to compression of the ureters from the gravid uterus. Hormonal effects of progesterone also may cause smooth muscle relaxation leading to dilation and urinary stasis, and vesicoureteral reflux increases (2). Bacterial contamination of the urine within the urinary tract (bacteriuria) is common and can at times result in microbial invasion of tissue responsible for the formation, transport and storage of urine. Pathogen-related conditions (such as the presence of invasion or virulence factors) affect the severity of the infection and its resistance to antibiotic therapy, but also different host related characteristics have been individuated, that play a role in particular in the possibility of infection recurrence (3). Urinary tract infection may involve only the lower urinary tract or both the upper and the lower tracts (1). The term cystitis has been used to describe the syndrome involving dysuria, frequency,
and occasionally suprapubic tenderness\(^4\). More than 95% of urinary tract infections are caused by a single bacterial species. *Escherichia coli* is the most frequent infecting organism in acute infection\(^4\). Other organisms that can be responsible for UTIs include Gram positive cocci, such as *Enterococcus faecalis*, *Staphylococcus aureus* and coagulase negative staphylococci (CoNS). Other Gram negative organisms responsible for causing UTIs include *Klebsiella* species, *Proteus* species, *Pseudomonas aeroginosa* and *Enterobacter* species\(^5\). The aim of the study was to evaluate the relation of UTI with type 2 diabetes

**Material and Method**

The study was conducted in the city of Kirkuk in the period from October 2019 to March 2020, which included 100 pregnant women with type 2 diabetes who attended obstetric, gynaecology and paediatric hospital in Kirkuk city and without any chronic disease. The study included the laboratory examination of the reactions samples, where close quantities of median reactions were collected for both groups. After collecting the calories, the calories were examined microscopically, and then the reactions were transplanted into the available culture media to isolate the etiology of urinary tract infections such as blood agar and MacConkey agar, and the CLED agar to isolate and diagnose bacteria of all kinds. In addition, the sensitivity test for antibiotics was applied by the feeding medium where the method were relied upon Global standard bacteriological culture procedure, isolation and diagnosis by biochemical tests. Type 2 diabetes has been defined as any person with diabetes who is over 15 years old and who uses oral treatment, not insulin.

**Finding:** Among diabetes mellitus patients included in this study, 80% were positive for UTI patients, while 20% were negative for UTI. Patients without DM showed no positivity for UTI … Table 1.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Diabetic</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>With UTI</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Without UTI</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

P. value 0.003

The study showed that majority of patients with UTI were suffered from G+ve bacteria as compared with DM patient without UTI.

**Table 2: Results of urine culture among study groups.**

<table>
<thead>
<tr>
<th>Results of urine culture</th>
<th>DM patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>With UTI</td>
</tr>
<tr>
<td></td>
<td>No.</td>
</tr>
<tr>
<td>Positive Bacterial culture</td>
<td>50</td>
</tr>
<tr>
<td>Negative Bacterial Culture</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
</tr>
</tbody>
</table>

P. value 0.002

In the present study the ages of the patients ranged between 16 and 65 years old. As shown in Table 3, the highest percentage of the patients among DM women were within the age group 26-35 years old constituted 44%. The lowest percentage was within the age group of 16-25 years old which constituted 31.03%.
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Table 3: Distribution of positive urine culture among pregnant and non-pregnant women according to age groups.

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-25</td>
<td>31.03</td>
</tr>
<tr>
<td>26-35</td>
<td>44</td>
</tr>
<tr>
<td>36-45</td>
<td>42.10</td>
</tr>
<tr>
<td>46-55</td>
<td>34.69</td>
</tr>
<tr>
<td>56-65</td>
<td>41.17</td>
</tr>
</tbody>
</table>

Table 4: Distribution of isolated bacteria among studied patients.

<table>
<thead>
<tr>
<th>Isolated Bacteria</th>
<th>DM No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Escherichia coli</td>
<td>29</td>
<td>26.36</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>9</td>
<td>8.18</td>
</tr>
<tr>
<td>Streptococcus faecalis</td>
<td>8</td>
<td>7.27</td>
</tr>
<tr>
<td>Serratia marcescens</td>
<td>5</td>
<td>4.54</td>
</tr>
<tr>
<td>Klebsiella pneumonia</td>
<td>19</td>
<td>17.27</td>
</tr>
<tr>
<td>Enterobacter cloacae</td>
<td>2</td>
<td>1.81</td>
</tr>
<tr>
<td>Proteus mirabilis</td>
<td>9</td>
<td>8.18</td>
</tr>
<tr>
<td>Proteus vulgaris</td>
<td>6</td>
<td>5.45</td>
</tr>
<tr>
<td>Staphylococcus epidermidis</td>
<td>7</td>
<td>6.36</td>
</tr>
<tr>
<td>Staphylococcus saprophyticus</td>
<td>8</td>
<td>7.27</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>8</td>
<td>7.27</td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>100</td>
</tr>
</tbody>
</table>

P. value 0.048

According to the distribution of the isolated bacteria among the study groups, as shown in Table 4, the common isolated bacteria among DM was *E. coli* which constituted 26.36% followed by *K. pneumoniae* which constituted 17.27%, *S. aureus* and *P. mirabilis* which constituted 8.18% and the lowest percentage was *Enterobacter cloacae* for 1.81%.

In this study *S. aureus* showed high rate of sensitivity to ciprofloxacin and oxacillin (88.23%) while it was resistant to ampicillin and lincomycin with rate of 100%. *Staphylococcus epidermidis* showed high rate of sensitivity to tobramycin and oxacillin (92.85%) while it was resistant to ampicillin, lincomycin and amoxicillin (100%). *Staphylococcus saprophyticus* showed high rate of sensitivity to cephalothin, ciprofloxacin, oxacillin and lincomycin while it was 100% resistant to ampicillin, erythromycin and amikacin. *Escherichia coli* showed high rate of sensitivity (93.02%) to ceftazidim and it was 100% resistant to oxacillin and lincomycin. *Klebsiella pneumoniae* showed high rate of sensitivity (81.48%) to amoxiclav and it was resistant to ampicillin, tetracycline, erythromycin, oxacillin and lincomycin. *Proteus mirabilis* showed high sensitivity rate to cefotaxim (94.44%) and it was resistant to erythromycin, ampicillin, oxacillin and lincomycin (100%). *Proteus vulgaris* showed high sensitivity rate to nitrofurontoin, cefotaxim (92.85%) and low rate of sensitivity to erythromycin. *Pseudomonas aeruginosa* showed high sensitivity rate to cefotaxim (86.66%) and low rate of sensitivity (20%) to ampicillin. *Enterobacter cloacae* showed high sensitivity rate to cefotaxim (100%) and it was resistant to erythromycin, tobramycin, oxacillin, streptomycin, cephalothin and amikacin (100%). All these results were summarized in Table 5.

Table 5: Distribution of Antibiotics Sensitivity of Gram Positive Bacteria Isolated from Married Women with UTI.

<table>
<thead>
<tr>
<th>Type of antibiotic</th>
<th>S. aureus</th>
<th>S. epidermidis</th>
<th>S. saprophyticus</th>
<th>E. coli</th>
<th>K. pneumoniae</th>
<th>P. mirabilis</th>
<th>P. aeruginosa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ciprofloxacin</td>
<td>88.23</td>
<td>50</td>
<td>56.25</td>
<td>79.06</td>
<td>59.25</td>
<td>77.77</td>
<td>73.33</td>
</tr>
<tr>
<td>Ampicillin</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6.97</td>
<td>0</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>47.05</td>
<td>28.57</td>
<td>43.75</td>
<td>30.23</td>
<td>0</td>
<td>11.11</td>
<td>53.33</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>70.58</td>
<td>50</td>
<td>0</td>
<td>6.97</td>
<td>0</td>
<td>0</td>
<td>26.66</td>
</tr>
<tr>
<td>Tobramycin</td>
<td>82.35</td>
<td>92.85</td>
<td>50</td>
<td>65.11</td>
<td>22.22</td>
<td>72.22</td>
<td>53.33</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>82.35</td>
<td>85.71</td>
<td>50</td>
<td>32.55</td>
<td>40.74</td>
<td>77.77</td>
<td>60</td>
</tr>
<tr>
<td>Oxacillin</td>
<td>88.23</td>
<td>92.85</td>
<td>56.25</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>26.66</td>
</tr>
</tbody>
</table>
Discussion

Urinary tract infection (UTI) in pregnant women with DM have special importance due to complication that results from its which can be dangerous to both mother and baby. Diabetes mellitus has long been considered to be a predisposing factor for urinary tract infection. Among DM patients included in this study, 82.14% were positive for UTI among married women. This clarifying the significance of the relation between DM and the occurrence of UTI among married women in this study which supported by other study, which showed that urinary tract infection is more prevalent among married women with DM. Nasir in his study found that there is an increase in the prevalence of asymptomatic pyuria among diabetic females with complications of retinopathy and nephropathy. The choice of antibiotic depends on the spectrum and susceptibility patterns of the uropathogens, its effectiveness for this indication, its collateral effects and coast. In current study Staphylococcus aureus showed high sensitivity to ciprofloxacin and oxacillin 88.23% and it was resistant to ampicillin and lincomycin with rate of 100%. Staphylococcus epidermidis showed high sensitivity to tobramycin and oxacillin with rate of 92.85%, while it was 100% resistant to each of ampicillin, lincomycin and amoxicillin. Staphylococcus saprophyticus was 100% resistant to each of ampicillin, erythromycin and amikacin. A study done by Amin et al showed that the most effective antibiotics against Gram –positive cocci was kanamycin, tobramycin and ciprofloxacin. A study by Mahdi who reported that gentamicin is the most effective antibiotic against Staphylococcus aureus. The current study was in agreement with Kandela who reported that multi resistance to antibiotics ranging between (7-19) antibiotics, and all isolates of K. pneumoniae were resistant 100% to ampicillin, cephalaxin, amoxicillin, penicillin, tetracycline, gentamycin and amikacin, in addition the isolates showed high resistance to third generation of cephalosporin included 60% resistant to ceftazidim and 80% resistant to cefotaxim and ceftriaxone. Imipenem and azteronem was found to be the most effective agents against the isolates. Amin in his study found that Gram negative bacilli were responsible for UTI infections, the most common isolated bacteria from urinary infections were E. coli and the most effective antimicrobial agents were amikacin, tobramycin and ciprofloxacin against Gram negative bacilli. A study by Fakhriddeen reported that the result of sensitivity appeared that most of used antibiotics were ineffective on E. coli isolates with exception of amikacin meropenem and ciprofloxacin respectively. A study done by Wu et al reported that most bacterial isolates exhibited sensitivity to antibiotics norfloxacin, cefotaxim, were the more effective antibiotics on bacterial isolates, while gentamicin, streptomycin and ultracloxam showed low effect. The highly sensitivity of all bacterial isolates to norfloxacin lead to consider that this drug is the best for treatment of UTI.
Conclusion

It was concluded that there was a significant relation of UTI with T2D and E. coli plus S. aureus were the predominate causes.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Kirkuk Health Directorate and all experiments were carried out in accordance with approved guidelines.

References

Nutritional Condition among Children Less than 5 Years Old in AL-Najaf City

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¹R.N. Community Health Nursing, ²Assist. Lecturer, Nursing Department, Altoosi University College, Iraq

Abstract

Background: A good nutrition is an essential component of good health. Malnutrition is known contributing factors to diseases and death. In the developing world, malnutrition affects approximately 800 million people, greater than 340 million whom are children under the age of five years. Over six million of those children die every year from malnutrition²).

Objectives: The study aims at assess the domains of nutritional status in term of (weight and height for age) through anthropometric measurements.

Methodology: A descriptive/Cross-sectional study is conducted throughout the period of October 1st 2019 to June 17th 2020 in order to nutritional status for children less than 5 years old in AL-najaf city in terms of (weight and height for age) through anthropometric measurements. And also, to find out the relationships between child’s and mother’s demographic characteristics and nutritional status.

A non-probability convenience sample of (1000) children with their mothers visiting the primary health care centers. This sample is distributed throughout two primary health care sectors according to Najaf Health Directorate. A total of (10) primary health care centers is selected for the purpose of the study. A pilot study was conducted and the questionnaire validity was achieved through a panel of (17) experts.

Results: The majority of children were normal with assessed regard the nutritional status by weight for age indicators, as well as, nutritional status assessed through height for age and weight for height nutritional indicators. Some socio-demographic characteristics influenced children nutritional status, especially the mother educational, level economic status of the family and breast feeding.

Conclusions: The majority of study sample recorded normal nutritional status according to all three nutritional indicators; weight for age (WAZ), weight for height (WHZ), and height for age (HAZ).

Recommendations: Nutrition counseling and education to the mothers is an important component on health services which would help to decrease the effect of ignorance and faulty cooking or dietary practices. As well as proper feeding, home health care, food preparation, hygiene.

Keywords: Assessment, Nutritional condition, Children less than 5 years.

Introduction

In Iraq there are several studies that are conducted in regarding the assessment of nutritional status in different children groups and different geographical areas, results reveals that nutritional status may affected the children health(¹). Malnutrition conceded single of the chief problems in community wellbeing challenges in developed countries. Regularly refer on the way to a silence urgent situation cases, it has devastation special effects resting on offspring especially under five years, society and future human-kind. It is several of the factor that strength give explanation the reason of such widely spread mal-nutrition in children low down delivery weight, inadequate provisions of nutrients, commonness of communicable disease, not have of breastfeeding, in addition to inappropriate child care(²).
Assessment of nutritional status for under five years’ children are monitored by the use of anthropometric measurements, specifically height and weight (BMI), which in combination with the age of the child forms the anthropometric indices. These are further classified as weight-age, measurement lengthwise or tallness-age, weight-measurement lengthwise or tallness in addition to body gathering guide-age\(^3\). The causes of under nutrition are diverse but in most cases include some degree of quality or else quantity of foodstuff, suboptimal feed practice, in addition to elevated tariff of communicable diseases \(^4\). The consideration of dietary condition of children be a necessary element of monitor physical condition in increasing countries. Early identification of whichever relating to diet problem is fundamental for the reason that, family unit, teacher, community psychotherapy as well as treatment interference are additional to be expected previous to undernourishment be converted into not as good as. The World Health Organization (WHO) estimate that a number of 3 billion populaces be ill with undernourishment of one type or other\(^5\). The better nutrition means immune systems stronger, due to fight infectious diseases and a lesser amount of ill health, enhanced wellbeing status as well as a community fruitful. Self-determination commencing lack of food in addition to undernourishment is a essential individual rights as well as their improvement is a basic precondition used for individual in addition to nationwide progress\(^6\).

**Objectives:** The study aims to assess the domains of nutritional status in term of (weight and height for age) through anthropometric measurements.

**Methodology**

A descriptive/Cross-sectional study is conducted throughout the period of October 1st 2019 to June 17th 2020 in order to nutritional status for children less than 5 years old in AL-najaf city in terms of (weight and height for age) through anthropometric measurements. And also, to find out the relationships between child’s and mother’s demographic characteristics and nutritional status.

A non-probability convenience sample of (1000) children with their mothers visiting the primary health care centers. This sample is distributed throughout two primary health care sectors according to Najaf Health Directorate. A total of (10) primary health care centers is selected for the purpose of the study. A pilot study was conducted and the questionnaire validity was achieved through a panel of (17) experts. Data were analyzed through the application of descriptive statistical data analysis approach that includes, frequencies and percentages; and inferential statistical data analysis approach that include Chi-squared test.

**Results**

**Table 1: Distribution of the Study Sample by their Demographic Data for Children**

<table>
<thead>
<tr>
<th>Child Demographic Data</th>
<th>Frequency N=1000</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>527</td>
<td>52.7</td>
</tr>
<tr>
<td>Female</td>
<td>473</td>
<td>47.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1000</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Age (months)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One hour- 10</td>
<td>82</td>
<td>8.2</td>
</tr>
<tr>
<td>11 – 22</td>
<td>122</td>
<td>12.2</td>
</tr>
<tr>
<td>23 – 34</td>
<td>530</td>
<td>53</td>
</tr>
<tr>
<td>35 – 46</td>
<td>180</td>
<td>18</td>
</tr>
<tr>
<td>47-60</td>
<td>86</td>
<td>8.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1000</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Types of Feeding</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast feeding</td>
<td>448</td>
<td>44.8</td>
</tr>
<tr>
<td>Mixed feeding(bottle feeding)</td>
<td>552</td>
<td>55.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1000</td>
<td>100%</td>
</tr>
</tbody>
</table>
This table depicts that the gender, those who were male in the study sample accounted (52.7%) and those who were female accounted for (47.3%). Concerning children age in the study, the majority of them was (23-34) months which accounted (53%). The child’s feeding pattern of mothers in the study was distributed as (44.8%) for breast feeding babies; and (53%) for mixed feeding.

Table 2: Distribution of the Study Sample by their Demographic Data for Mothers

<table>
<thead>
<tr>
<th>General Information (Mothers’ Data)</th>
<th>Frequency N=1000</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother Education Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not able to read and write</td>
<td>294</td>
<td>29.4</td>
</tr>
<tr>
<td>Read and write</td>
<td>158</td>
<td>15.8</td>
</tr>
<tr>
<td>Primary school</td>
<td>396</td>
<td>39.6</td>
</tr>
<tr>
<td>Middle school</td>
<td>62</td>
<td>6.2</td>
</tr>
<tr>
<td>High school</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>Institute</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Bachelor</td>
<td>44</td>
<td>4.4</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>6</td>
<td>0.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1000</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Mothers Occupation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>House wife</td>
<td>704</td>
<td>70.4</td>
</tr>
<tr>
<td>Government employee</td>
<td>284</td>
<td>28.4</td>
</tr>
<tr>
<td>Retired</td>
<td>12</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1000</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Monthly Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sufficient</td>
<td>466</td>
<td>46.6</td>
</tr>
<tr>
<td>Insufficient</td>
<td>534</td>
<td>53.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1000</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table represents the distribution of the mother’s demographic data in term of frequencies and percentage. The mother’s education, (39.6%) mothers had primary school levels. Regarding mother’s occupation, results indicated that the (70.4%) of them were housewife. Concerning monthly income, the family income is enough or more than enough.

Table (3): Distribution of Study Sample by their Nutrition Status through Anthropometric Measurement (WAZ, HAZ, and WHZ)

<table>
<thead>
<tr>
<th>Nutrition Status Domain</th>
<th>Frequency N=1000</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weight for age score</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>770</td>
<td>77</td>
</tr>
<tr>
<td>Overweight</td>
<td>114</td>
<td>11.4</td>
</tr>
<tr>
<td>Obesity</td>
<td>40</td>
<td>4</td>
</tr>
<tr>
<td>Underweight</td>
<td>76</td>
<td>7.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1000</td>
<td>100%</td>
</tr>
<tr>
<td>Nutrition Status Domain</td>
<td>Frequency N=1000</td>
<td>Percentage</td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Height for age score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>658</td>
<td>65.8%</td>
</tr>
<tr>
<td>Tall</td>
<td>136</td>
<td>13.6%</td>
</tr>
<tr>
<td>Stunting</td>
<td>206</td>
<td>20.6%</td>
</tr>
<tr>
<td>Total</td>
<td>1000</td>
<td>100%</td>
</tr>
<tr>
<td>Weight for Height score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>800</td>
<td>80%</td>
</tr>
<tr>
<td>Overweight</td>
<td>114</td>
<td>11.4%</td>
</tr>
<tr>
<td>Obesity</td>
<td>20</td>
<td>2%</td>
</tr>
<tr>
<td>Wasting</td>
<td>66</td>
<td>6.6%</td>
</tr>
<tr>
<td>Total</td>
<td>1000</td>
<td>100%</td>
</tr>
</tbody>
</table>

In assessing nutritional status by (WAZ): weight for age z scores, (HAZ): height for age z scores, and (WHZ): weight for height z scores. F= Frequency, %= Percentage

The findings revealed the distributions of the study sample according to the nutritional status indicators in term of WHZ, HAZ, and WAZ. Nutritional status is classified into three levels (underweight, normal, overweight and obesity) that concerning weight for age, (normal, tall and stunting) that concerning height for age. In concerning weight for height, the level includes (normal, overweight, obesity and wasting). In general, the proportion of normal weight recorded a higher percentage in first nutritional indicator (77%) through assessing the weight for age. In assessing nutritional status by height for age the normal account (65.8%). Regarding assessing nutritional status by weight for height indicators the table reveals that the results account (80%) of children were normal.

**Discussion**

The preschool period is the period between 3 and 6 years of age, this is a time of continued growth and development. Physical growth continues much more slowly compared to earlier years. The average preschool age child will grow (6.5-7.8cm) per year. The average 3 years old is (96.2cm tall), the average 4 years old is (103.7cm tall), and the average 5 years old is (118.5cm tall). Average weight gain during this time period is about (2.3kg) per year. The average weight of a 3 years old is (14.5kg), increasing to an average weight of (18.6kg) by age 5(7). The results in this work agree with the results obtained by other reposts such as (8) who have studied nutritional status of under five children in Baghdad-Iraq. Their findings indicate that the (52.7%) of the study sample are male. Also this agree with the (rapid nutritional assessment survey carried out by UNICEF 2010-2011) which shows that (53%)of children under 5 years are males. The present of underweight stunting and wasting in this study are similar in the finding of study conducted in Turkey the researchers found the prevalence’s were 4.8%, 8.2% and 10.9 respectively (9) these figures are lower than ours. But our findings are much lower than the findings gained by other researchers in different districts in many developing countries. In Nagpur who found that underweight, stunting and wasting (46%, 52%, and 20.7%) (10).these variations between the findings of this study and other studies may be due to the variation in socioeconomic wellbeing status or the variations in the study designs and sample sizes. Our results are lower than that reported by a hospital based local study conducted by (11).Regarding children age in the present study ranged from (0-47) months and above. The higher percentage of the sample is among age group (23- 34) which constitutes (53%) table (1). The World Health Organization estimates that malnutrition accounts for 54 percent of child mortality worldwide, in this age group was 1 million children every year. Another estimate also done by WHO states that childhood underweight is the cause for about 35% of all deaths of children under the age of five years worldwide(12). These results are concurrent with the study which has been assessed relating to diet condition of kindergarten children: a socio-economic learning of
rural area of Kasaragod District in Kerala. Their findings indicate that most children are in the age group (39-43) month (13).

Study results depicted that the (39.6%) of mothers had primary school levels of education table (2). A study has been tested relating to diet status of underneath five years’ age children in Akure South Local Government, Ondo State, Nigeria. Their findings indicate that the most of mothers (66%) are primary school educated and most of them are household. Results concludes that the mothers’ education affected the health status of the children (14). Concerning monthly income, most of families have been insufficient monthly income that account (53.4%) which affects their socio-economic status table (2).

These results concurrent with the results reported by a study conducted on determinants of nutritional status in children under 5 years in India: A multilevel approach study. Their results indicate that the most of families making low socio-economic status and low income (15). Socio-economic status particularly monthly income is an important factor that affects nutritional status in positive and negative terms, in an example regard the socio-economic status, a study has been tested factors affected HB and anemia among children. Their findings indicate that the families with low income may have a difficulty to buy food or medicines rich in iron or others need as recommended by the health care providers. Otherwise, families with high monthly income they will able to provides all the necessary food or others needs to treat the anemia, so the economic status is an important factor that will affects the HB level and others needs related to balance diet that protect the health of rapidly growing children under five (16). As personal point of view, mothers as being employed to improved economic status of the family directly and higher economic status provide and facilitate all children’s needs regarding nutrition, health care needs, education, family type, live in crowded or big families and all aspect of life. But mother employment some time affect child nutritional status negatively, because employed mothers spend many hours outside the house which reduce time for child care(17).

**Conclusion**

The majority of study sample recorded normal nutritional status according to all three nutritional indicators; weight for age (WAZ), weight for height (WHZ), and height for age (HAZ). Most of the mothers were primary school educated and more than half of them were housewife. Most of the fathers were highly educated and they were employed or have their own free work. Most demographic characteristics of parents and children have influenced their children nutritional condition.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Community Health Nursing, Nursing Department and all experiments were carried out in accordance with approved guidelines.

**References**


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Relationship of ABO Blood Groups with Body Mass Index

Sarah Abdulateef Kadhum¹, Wafaa Abd Ali Hattab², Musaab Majid Abdulwahhab²

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²Ph.D. (University of Baghdad-College of Nursing-Adult Nursing Department)

Abstract

Background: Obesity predisposing factors have been raised as a major concern of researchers due to the consequences of obesity on health such as diabetes, hypertension, and depression, ABO blood groups linked to many diseases, so may affect directly or indirectly on the incidence of obesity.

Objectives: The study aims to find out the association of ABO blood groups with body mass index.

Method: A cross-sectional study was conducted with a non-probability purposive sample of 2604 young adulthood age (18-25 years) that does not have previous surgery or chronic diseases through an electronic questionnaire in Iraq. A statistical package for social science (SPSS) program, version 24 was used for descriptive and inferential statistics.

Results: Blood group O was a common frequency in people with increased body mass index, so high statistically significant association recorded (p ≤ 0.001). In addition, most of the subject (86.6%) have positive rhesus (RH +).

Conclusions: People with blood group O and positive RH were most vulnerable to increase their body mass index.

Keywords: Relationship, ABO blood groups, Body Mass Index.

Introduction

It is really important to identify the obesity predisposing factors; Obesity has major consequences on the physical and psychosocial aspects. Hypertension², diabetes mellitus³, cardiovascular diseases⁴, depression, and anxiety⁵ may develop as a result of obesity; this study tries to find out if the ABO blood groups are a factor to develop obesity. Many studies demonstrate that the blood groups correlate to several diseases such as osteoporosis, thyroid disorder, and hyper-cholesterolemia.⁶,⁷ These studies help to identify the diseases vulnerability and take preventive measures to decrease the incidence and that what are going to do in this study. If we recognize the blood group that has the highest vulnerability to develop obesity so we can take more attention to help prevent people with this blood group to develop obesity.

Objectives of the Study: The study aims to find out the association between blood groups with body mass index.

Materials and Method

Design of the Study: A cross-sectional study was conducted with a non-probability purposive sample of 2604 young adulthood age (18-25 years) that does not have previous surgery or chronic diseases through an electronic questionnaire in Iraq.

Study Instrument: BMI was calculated by division body weight in Kilogram on the height in Metric Square

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\[ BMI = \frac{\text{Bodyweight (Kg)}}{\text{Height (m)}} \], and WHO classification of BMI was adopted as shown in (Table 1).

### Table 1: Classification of BMI

<table>
<thead>
<tr>
<th>BMI</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 18.5</td>
<td>Underweight</td>
</tr>
<tr>
<td>18.5–24.9</td>
<td>Normal weight</td>
</tr>
<tr>
<td>25.0–29.9</td>
<td>Overweight</td>
</tr>
<tr>
<td>30.0–34.9</td>
<td>Class I obesity</td>
</tr>
<tr>
<td>35.0–39.9</td>
<td>Class II obesity</td>
</tr>
<tr>
<td>≥ 40.0</td>
<td>Class III obesity</td>
</tr>
</tbody>
</table>

**Results**

Study results demonstrate that the blood group O records the highest percentage (40.8%) of the study sample followed by (34.8%), (22.6%), (12.8%) of A, B, and AB blood groups respectively (Figure 1). While the majority (86.6%) of Rhesus was positive with (13.4%) negative (Figure 2).

Concerning the classification of BMI, most of the subject (54%) was obesity 3 followed by Obesity 2 that record (20%) and the lowest percentage (4%) was recorded in an underweight group. In addition, the males were (54.7%) and female (45.3%). (Figure 4)
Table 2: Association of ABO blood groups with BMI

<table>
<thead>
<tr>
<th>Blood group</th>
<th>Underweight</th>
<th>Normal</th>
<th>Overweight</th>
<th>Obesity 1</th>
<th>Obesity 2</th>
<th>Obesity 3</th>
<th>Total</th>
<th>df</th>
<th>Chi Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>23</td>
<td>31</td>
<td>43</td>
<td>29</td>
<td>144</td>
<td>351</td>
<td>621</td>
<td>15</td>
<td>0.000</td>
</tr>
<tr>
<td>B</td>
<td>18</td>
<td>40</td>
<td>54</td>
<td>38</td>
<td>97</td>
<td>341</td>
<td>588</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AB</td>
<td>24</td>
<td>19</td>
<td>39</td>
<td>23</td>
<td>56</td>
<td>172</td>
<td>333</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>40</td>
<td>46</td>
<td>93</td>
<td>104</td>
<td>228</td>
<td>551</td>
<td>1062</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>105</td>
<td>136</td>
<td>229</td>
<td>194</td>
<td>525</td>
<td>1415</td>
<td>2604</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Differences of Rhesus toward BMI

<table>
<thead>
<tr>
<th>BMI</th>
<th>RH</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>2256</td>
<td>63.4511</td>
<td>241.7227</td>
<td>5.08918</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>348</td>
<td>45.0455</td>
<td>10.13388</td>
<td>.54323</td>
<td></td>
</tr>
</tbody>
</table>

Independent Samples Test

<table>
<thead>
<tr>
<th>Levene’s Test for Equality of Variances</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal variances</td>
<td>5.35</td>
<td>.021</td>
</tr>
<tr>
<td>Not Equal variances</td>
<td>3.59</td>
<td>.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>t-test for Equality of Means</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
<th>Std. Error Difference</th>
<th>95% Confid. Lower</th>
<th>95% Confid. Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal variances</td>
<td>1.42</td>
<td>2602</td>
<td>.156</td>
<td>18.40563</td>
<td>12.96156</td>
<td>-7.010</td>
<td>43.82</td>
</tr>
<tr>
<td>Not Equal variances</td>
<td>3.59</td>
<td>23.73</td>
<td>.000</td>
<td>18.40563</td>
<td>5.11809</td>
<td>8.36</td>
<td>28.44</td>
</tr>
</tbody>
</table>

Std: standard, sig: significant, t: independent t test, df: degree of freedom, N: number of subject

The BMI record high statistically significant association with ABO blood group (Table 2) added to that, the Rhesus was being found a statistical difference with BMI (Table 3).

Discussion

The study aims to find out the impact of ABO blood groups on the incidence of obesity so we can provide preventive measures to that group with the highest vulnerability to obesity such as a healthy lifestyle and dietary habits.

The study result showed that the majority (40.8%) of our sample was the blood group O, followed by A, B, and AB. In addition, the positive rhesus records the highest distribution (86.6%) in comparison to negative rhesus. These results come along with many studies about the distribution of ABO blood groups in Iraq.[7-10]

The blood group O takes the highest frequency of increase body weight, the main cause of that result need to be more studied. However many articles demonstrate that the blood group O preferred the high protein diet with lean meat and fish[11] added to that the type O blood group tend to Yoga and limited exercise in comparison to other blood groups that may prefer lifting weights and heavy exercise, eventually blood hormones level (such as catecholamines and cortisol) will be changed according to that exercise.[12]

The individuals with positive Rh record significant difference and obvious increase in their body weight when compared with peoples that have negative rhesus. Much more studies needed to explain that’s fact and that may affected by race or specific geographical area.[13, 14]

Acknowledgements: The authors thank to the University of Baghdad - College of Nursing for their cooperation to complete the official request for conducting the research.

Conflict of Interest: There are no conflict of interest concerning this research and the manuscript has not been submitted to another journal or publishing venue.
Financial Resources: The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript.

Informed Consent: Before filling the questionnaire, all participants were asked if they agree or disagree to participate in the research.

Conclusions: There are differences concerning physical and economic status between Americans and Iraqis. Americans record better physical activity and economic status. The psychological domain demonstrates that both communities had negative emotions, anxiety and depression as a result of COVID 19, curfew and social distancing.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Al-Bayan university-College of Nursing-Adult Nursing Department and all experiments were carried out in accordance with approved guidelines.

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7. Eren C, Çeçen S. An analysis on the association between ABO and Rh blood groups with obesity. Proceedings of the National Academy of Sciences, India Section B: Biological Sciences. 2019 Sep 2;89(3):1095-100.
Clinical Profile and Outcome of Children of Aged 6 -59 Months Admitted with Severe Acute Malnutrition at Medical College, Silchar, Assam

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¹Associate Professor; ²Assistant Professor; ³Junior Resident, Department of Pediatrics, Silchar Medical College, Assam, India

Abstract

Background: Inspite of significant economic improvement of India, prevalence of malnutrition specifically severe acute malnutrition is significantly high. According to NFHS-4(2015 -2016) report, 7.4% of malnourished children are severely wasted in India and in Assam it is 6.2%. Clinical profile of acute severe malnutrition (SAM) is different from place to place. Understanding of child health profile in different geographical area will help to prioritize intervention and resource allocation.

Material and Method: Hospital based prospective observational study carried out in the department of Pediatrics, Silchar Medical College, Assam, India from July 2018 to June 2019. 50 SAM children of aged 6 months to 59 months were included into the study after meeting the inclusion criteria. Historical, clinical and laboratory data were recorded in a predesigned proforma. Data were analysed using appropriate statistical method.

Results: The prevalence of severe acute malnutrition is 2.7%. The mean age of study population is 21.86 ± 14.85 months. 68% were male and 32% were female out of the 50 SAM children. Nondematous SAM were more (56%) than the edematous SAM (44%). Highest incidence of SAM were in the age group of 6-24 months (68%). Almost all the cases (96%) belonged to low SES. 78% mothers were either illiterate or primary school educated. EBF up to 6 months of age were only in 16% of cases. Major clinical presentation were diarrhea (70%), fever (68%), anorexia (66%), ARI (56%), vomiting (38%), eye problems (38%). Co-morbid conditions associated with SAM were anemia (86%), pneumonia (42%), worm infestation (40%) followed by UTI (38%) & tuberculosis (16%). Recovery rate is 54%. Mean hospital stay is 10.28± 5.84 days. 2 children (4%) died during hospital stay.

Conclusion: Severe acute malnutrition is the most severe life threatening form of malnutrition which requires urgent attention. Timely identification and intervention of various risk factors, clinical and co-morbid condition is likely to break the viscous cycle of undernutrition, infection and SAM and thereby improve outcome.

Keywords: Severe acute malnutrition, female literacy, socio-economic status, wasting.

Introduction

Malnutrition in children is the most serious health problem affecting globally till twenty first century with much more prevalent in the developing countries including India. Many children die everyday directly or indirectly from malnutrition. With proper attention and nutritional therapy most of these deaths can be prevented.¹ Severe acute malnutrition (SAM) is an unique type of severe
malnutrition. It is the most severe and life threatening form of malnutrition in children and is responsible for high morbidity and mortality among malnourished children. Globally approximately 19 million children under five years of age suffered from SAM in 2015. The World Health Organization (WHO) has recommended this special classification for identifying and managing children with life threatening malnutrition. Severe acute malnutrition is defined as presence of any of the following: weight for height/length below -3 standard deviation (SD or Z score) of the median WHO growth reference ii) presence of bipedal nutritional edema or iii) mid upper arm circumference below 115 mm in the age group of 6 months to 59 months. A vast majority (over 90%) of children with SAM is located in south and south east Asia and Sub Saharan Africa. India has the greatest population of severely malnourished children in the world and accounts for over 20% of under five childhood death every year and around 2.1 million children in this country do not survive to celebrate their first birthday. According to National Family Health Survey 4 (NFHS-4, 2015-2016) report, in India, 7.4% of malnourished children are severely wasted (weight for height < -3 SD) and in Assam, 6.2% of under five children are severely wasted. Since wasting denotes acute malnutrition, these children are said to have severe acute malnutrition.

Better clinical characterization, triage and appropriate treatment of complications on admission along with nutritional therapy and targeted supportive treatment as outlined in the WHO protocol is associated with improved outcome.

Clinical profile of severe acute malnutrition is different from place to place or region to region. As the underlying clinical factors, co morbidities and health system infrastructure differ in places and countries, understanding of the childhood profile in different places will help to enable proper targeting and prioritizing of intervention and resource allocation.

There is wide a variation of spectrum of nutritional disorders in this southern Assam, India, a geographically landlocked region with population of diverse ethnicity, multilinguality, religion and cultural practices with the rest of the country.

Objective: on the background of the above introduction, the present study was conducted with the objective of determining 1. The prevalence of SAM in this region 2. The clinical profile associated with SAM like risk factors, co-morbid conditions and type of SAM 3. Outcome of SAM after hospitalization and treatment.

Material and Method

This hospital based prospective study was done in the department of Pediatrics, Silchar Medical College, Assam, India for a period of one year (July 2018 to June 2019). A total of 50 children of age 6 months to 59 months admitted in the department for severe acute malnutrition related complaints were included for study. The geographical locations of the study population were Barak Valley, Assam and neighbouring states. The children were enrolled for the study after satisfying the following inclusion and exclusion criteria.

Inclusion Criteria:

(i) Wt for ht/length < -3 SD or Z score of median WHO growth reference.
(ii) MUAC < 11.5 cm
(iii) Nutritional edema of feet.

Exclusion Criteria:

(i) Children with non nutritional causes of SAM.
(ii) Children with congenital anomalies, mental retardation, cerebral palsy, chronic renal diseases, congenital chronic hemolytic anemia.

Informed consent of parents was taken before inclusion to the study. Details clinical and laboratory parameters were recorded in a pre designed proforma. Anthropometry was done with electronic weighing machine with sensitivity of ±10 gm, infantometer and stadiometer, narrow flexible nonstretchable measuring tape. Z score was calculated using WHO MGRS standard deviation chart. Laboratory tests like blood sugar(R), hemoglobin level, serum electrolytes, TC, DLC, X-Ray chest, mantoux test, stool and urine for routine and culture were routinely done. Other specific tests were done whenever necessary. Therapeutic management of all the cases was done according to the protocol of WHO and Indian Academy of Pediatrics (IAP).

Discharge criteria. SAM cases were discharged when they met the following criteria.

1. Satisfactory weight gain i.e >15% of admission weight.
2. Edema resolved.
3. Return of good appetite.
4. Medical complications treated.

Statistical analysis of data was done using Statistical Package for Social Sciences (SPSS 16.0 version).

**Results**

1. Prevalence of SAM. The overall prevalence of severe acute malnutrition in our study population is 2.7%.

2. Socio demographic profile (Table 1).

**Table 1: Socio demographic profile**

<table>
<thead>
<tr>
<th>1. Gender</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>34(68)</td>
</tr>
<tr>
<td>Female</td>
<td>16(32)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Age in months (mean)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6 -12 (9.2)</td>
<td>18 (36)</td>
</tr>
<tr>
<td>13 -24 (16.3)</td>
<td>16 (32)</td>
</tr>
<tr>
<td>25 -36 (33.8)</td>
<td>7 (14)</td>
</tr>
<tr>
<td>37 -48 (45.7)</td>
<td>8 (16)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Religion</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindu</td>
<td>21(42)</td>
</tr>
<tr>
<td>Islam</td>
<td>28(56)</td>
</tr>
<tr>
<td>Christian</td>
<td>1 (2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Socio economic status</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower</td>
<td>10(20)</td>
</tr>
<tr>
<td>Upper lower</td>
<td>38(76)</td>
</tr>
<tr>
<td>Middle</td>
<td>2 (4)</td>
</tr>
<tr>
<td>Upper</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Parental literacy</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother</td>
<td>39(78)</td>
</tr>
<tr>
<td>Father</td>
<td>20(40)</td>
</tr>
<tr>
<td>Upto high school</td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>11(22)</td>
</tr>
<tr>
<td>Father</td>
<td>30(60)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2: Clinical profile</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Risk factors n(%)</td>
<td></td>
</tr>
<tr>
<td>Low SES 48(96)</td>
<td></td>
</tr>
<tr>
<td>No EBF 42(84)</td>
<td></td>
</tr>
<tr>
<td>Low maternal education 39(78)</td>
<td></td>
</tr>
<tr>
<td>Delayed &amp; thin complementary feed 35(70)</td>
<td></td>
</tr>
<tr>
<td>Incomplete immunization 35(70)</td>
<td></td>
</tr>
<tr>
<td>2. Type n(%)</td>
<td></td>
</tr>
<tr>
<td>Non edematous 31(62)</td>
<td></td>
</tr>
<tr>
<td>Edematous 19(38)</td>
<td></td>
</tr>
<tr>
<td>3. Clinical Presentation n(%)</td>
<td></td>
</tr>
<tr>
<td>Diarrhoea 35(70)</td>
<td></td>
</tr>
<tr>
<td>Fever 34(68)</td>
<td></td>
</tr>
<tr>
<td>Anorexia 33(66)</td>
<td></td>
</tr>
<tr>
<td>ARI 28(56)</td>
<td></td>
</tr>
<tr>
<td>Vomiting 19(38)</td>
<td></td>
</tr>
<tr>
<td>Eye problem 19(38)</td>
<td></td>
</tr>
<tr>
<td>Hypoglycemia 7(14)</td>
<td></td>
</tr>
<tr>
<td>4. Co-morbity n(%)</td>
<td></td>
</tr>
<tr>
<td>Anemia 43(86)</td>
<td></td>
</tr>
<tr>
<td>Pneumonia 21(42)</td>
<td></td>
</tr>
<tr>
<td>Worm infestation 20(40)</td>
<td></td>
</tr>
<tr>
<td>UTI 19(38)</td>
<td></td>
</tr>
<tr>
<td>TB 8(16)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 3: Outcome</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovery (Wt gain &gt;15% of admission wt) n(%) 27(54)</td>
<td></td>
</tr>
<tr>
<td>Non respondent (Wt gain &lt;10gm/kg/day) n(%) 15(30)</td>
<td></td>
</tr>
<tr>
<td>Average Wt gain gm/kg/day 7.5</td>
<td></td>
</tr>
<tr>
<td>Defaulters n(%) 6(12)</td>
<td></td>
</tr>
<tr>
<td>Duration of hospital stay, days (mean) 10.28 ±5.84</td>
<td></td>
</tr>
<tr>
<td>Death n(%) 2(4)</td>
<td></td>
</tr>
</tbody>
</table>

**Discussion**

The prevalence of SAM in our study is 2.7% which is lower than the national prevalence (7.9%, NFHS-3). Similar prevalence were reported by A S Bhadoria from northern India and H D Shewade from Puducherry as 2.2% and 3.6% respectively. Prevalence of SAM varies widely across the Indian states.

We observed that male children with SAM were almost twice as that of female (68% vs 32%). Similar findings were observed by few workers. However, studies by M B Sing and S Rao found higher prevalence of SAM among girls. Higher prevalence in males in our study may be due to more importance given to male child for medical care because of societal attitude.
Though our study population is from the Hindu majority area, more number of SAM (56%) is seen amongst Muslim children. We could not correlate any association of prevalence of SAM with religion. This may be because of small sample size and needs further socio-demographic studies.

The mean age of the study population is 21.86 ± 14.85 months. Two third (68%) of the total cases belong to the age group of 6-24 months. Similar results also reported by Aguaya et al in studies in Jharkhand where 77.7% of SAM patients were below 2 years of age. More number of cases in our study is seen between 6-12 months. This may be due to late introduction of complementary feeds, inadequate (thin) food, less birth spacing.

Almost all the SAM cases in our study (96%) belong to lower socio-economic class (Kuppuswamy scale IV and V). No cases belong to upper SE class. This indicates the unavailability of food, poor purchasing power, lack of nutrition knowledge in a deprived community. Similar observation was made in other study also.

78% of mothers and 40% fathers of SAM children were either illiterate or had only primary school education. Only 28% mothers were high school educated. Parental education specially women literacy is the most important determinants of malnutrition. Educated mother will have a greater awareness of nutrition, balanced diet and health of their children. Several studies from Bangladesh and India observed such correlation between low parental education and malnutrition in children.

84% of the SAM children did not receive exclusive breast feeding up to 6 months of age. Similarly 35(70%) children had delayed start of complementary feeding with thin or watery food. These two-non EBF and improper complementary feeding caused SAM in majority of cases below 2 years of age. Similar observations were made by K Mishra et al in their study. Other risk factors observed likelow maternal education, incomplete immunization were 78 and 70% respectively. Out of 50 SAM cases, non edematous SAM was more (62%) than edematous SAM in our study.

Diarrhoea (70%) and fever (68%) were the most common clinical presentation followed by anorexia (66%), ARI (56%), vomiting (38%), eye problems (38%) and hypoglycemia 14% of SAM cases. Similar findings were reported by R Kumar et al in their study.

Among the co-morbid conditions, 43 children (86%) had anemia of varying grades. Prevalence of other co-morbid conditions were pneumonia (42%), worm infestations (40%), UTI (38%) & tuberculosis (16%). These findings are consistent with previous reports.

On analysis of outcome of SAM cases in this study, it is found that 54% recovered (wt gain >15% of admission wt) and 30% did not respond (wt gain < 10 gm/kg/day) to treatment. Average weight gain and mean duration of hospital stay were 7.5 gm/kg/day and 10.28 ± 5.84 days. Six children (12%) defaulted & 2(4%) died during hospital stay. In a similar study by K Sing, N Badgaiyan and K P Kushwaha in Uttar Pradesh in 2010, they reported average weight gain as 7.3 gm/kg/day, average hospital stay of 13.2 days, recovery rate of 46.8% and discharge without recovery as 53.2% in their study.

Conclusion

Severe acute malnutrition is the most severe and life threatening form of malnutrition which requires urgent attention. Timely identification and intervention of various risk factors, clinical and co-morbid conditions is likely to break the vicious cycle of undernutrition, infection and SAM and thereby improve outcome.

Abbreviation: SES-socio-economic status, Wt-weight, SD-standard deviation, MUAC-mid upper arm circumference, ARI-acute respiratory infection.

Funding: None.

Conflict of Interest: None.

Ethical Approval: The study was approved by the Institutional Ethics committee, Silchar Medical College on 16.3.2018.

References


New Media from Plant Extracts for Isolation of Some Pathogenic Bacteria that Produce Protease on Linum Usitatissium Seed Powder Agar and to Identify Serratia Marcescens

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Abstract

Prepared two concentration of four new enriched media for isolation of some pathogenic bacteria including Acinetobacter baumannii, Klebsiella pneumoniae, Escherichia coli, and Serratia marcescens and identification of Serratiamarcescens that produce red pigment (prodigiosin). The first concentration 12.5 g/l of plant extracte showed heavy growth of pathogenic bacteria on the four media. The second concentration 25 g/l showed also growth of the pathogenic bacteria incubation in 37°C for 24h except on the Elettaria cardemomum agar and, Fenugreek (Trigonella foenum-graecum) seeds agar. Serratia marcescens produce red pigment on all the new media in both concentration. All isolates produce protease enzyme on Linum usitatissium seed agar. The result is a synthesis enrichment and inexpensive medium for different species of bacteria like Linumusitatissium enriched with a different materials and salt as a mineral that suitable for growth organism without any morphological change of metabolisms feature, also identification Serratia marcescens by produce red pigment that important in medical with a wide range of biological activities.

Keywords: Prodigiosin, Trigonella foenum-graecum, Serratia marcescens, pigment.

Introduction

Pathogenic bacteria causes different disease including pneumonia, tuberculosis, and food borne illnesses in immunocompromised patients and healthy individuals that have antibiotics resistance with wide range.(1)

Serratia marcescens is agram negative bacteria that secreted serratiopeptidase enzyme used for treatment sinusitis, surgery, arthritis and different disease(2,3,4). Prodigiosin is the red pigment secreted from Serratia marcescens with biological activities in wide range as anti fungal, immunosuppressant, antimalarial and antibiotic agent which produce the pigment needs optimum condition(5,6) including the presence of NaCl, soy bean meal, PH, temperature, salts, and others(7).

Protease enzyme is one of an important industriual enzyme that produce from different type of pathogenic bacteria and use in medical, food, and industrial field. The Protease enzyme is an extracellular enzyme which responsible for virulence of pathogenic bacteria(8).

The parts of plant consist of many different components that including proteins and oil some of which are carbohydrates, vitamins, sugar, aminoacids and minerals(9). The plants can be found in many places and used for various diseases as therapeutic agent because the presence of phenol like tannins that have ability to form hydrogen bonds with carbohydrates and proteins by inhibition of some enzymes in the living cell leading to inhibit growth pathogenic bacteria(10,11).

Elettaria cardamomum is one of spices old very in the world and commonly known as green or true cardamom, Heilin Arabic(12,13,14).
This grain be smell and taste that contains fixed and evolution in seeds and contains metal and material natural. *Elettaria cardamomum* have activity compounds are Glycosides, Saponins, Alkaloids, Volatile, and Tannins\(^{15}\).

Flax (*Linum usitatissimum*), also known as linseed or common flax\(^{16}\).

Activity compounds of flaxseed (*Linum usitatissimum*) are saponins, flavonoids, Resins, glycosides, alkaloids, Vitamin, carbohydrates, Protein oil and oil components from fatty acids are fatty acids\(^{17,18}\).

Flaxseeds protecting from cancers, which contain high levels of fatty acids, and omega-3 which inhibit the growth of cancerous tumors\(^{19}\).

Fenugreek (*Trigonella foenum-graecum*) is one of the medicinal plants

Common name is Fenugreek (Hilba), Scientific name: *Trigonella foenum-graecum L*\(^{20,21}\).

The composition of Fenugreek seeinclude, alkaloids, coumarins, flavonoids, saponins and vitamins\(^{22}\).

Fenugreek seeds used in the treatment of stomach ulcer, and Urinary tract infection\(^{23}\).

*Laurus nobilis L.* from the family Lauraceae, that comprises numerous aromatic and medicinal plants\(^{24}\).

The plant content of the compounds was identified effective by preliminary chemical tests of plant powder, plant leaves where the containment of tannins, saponins, flavonoids, alkaloids, glycosides, Resins, and Phenols. Antibacterial and antimicrobial properties are essential oil of leaves\(^{25,26}\).

**Materials and Method**

**Sample of plant:** The plant used in this study consisted of *Laurus nobilis L.* (bay laurel) leaf and, Flax (*Linum usitatissimum*) seeds, *Elettaria cardamomum*, Fenugreek (*Trigonella foenum-graecum*) seeds were purchased from a local market in Baghdad, Iraq and grounded to powder for further use.

**Plant Extract Preparation:** Aqueous hot extract: Weight 50 g of air-dried powder of plant was added to 500 ml of distilled water, boiled for 15 minutes leave to cool then it was filtered through 6 layers of muslin cloth into a sterile flask later the filtered plant extracts into sterile glass plate which dried in an oven for 24h. At 50 Celsius then crushed drying the plants extract into powder then preservation the drying particle into a sterile container for each plants extracts\(^{27,28}\).

Preparation plant powder agar: The (20g/l)agar-agar was Prepared (Difco) and autoclave at 121°C\(^0\) for 15 min and cool to(45-55)°C then added plants powder (25g/l) the pH was adjusted to 7.0 mixed well and dispensed into sterile Petri dishes for each type of plants\(^{29}\). Another concentration 12.5 g/l will prepared at the same method. The media (*Linum usitatissimum seeds agar, Laurus nobilis L. leaves agar, Trigonella foenum-graecum seeds agar and Elettaria cardamomum agar*) were inoculated with isolates of (*Acinetobacter baumannii, Klebsiella pneumoniae, Escherichia coli*, and *Serratiamarcescens*) and incubated at 37°C for 24 hours.

Microbial isolates: Four isolates *Acinetobacter baumannii, Klebsiella pneumonia*, *Serratia marcescens*, and *Escherichia coli* were isolated from clinical specimens that had been submitted to the bacteriology laboratory in Al-Kindy Educational Hospital, Baghdad, Iraq. The Vitek 2 system (Biomerieux) using to identified all isolates.

**Results and Discussion**

All isolates showed a growth on *Linum usitatissimum* agar, *Laurus nobilis L.* agar and *Trigonella foenum-graecum* agar and *Elettaria cardamomum* agar that prepared in the first concentration 12.5g/l all isolate incubated in 37°C\(^0\) for 24 hours as shown in (fig.1, 2) (Table1), while the second concentration 25g/l shown also growth of pathogenic bacteria on *Linum usitatissimum* agarand *Laurus nobilis L.* agar except *Elettaria cardamomum* agar and *Trigonella foenum-graecum* agar no pathogenic bacteria growth (Fig.3)(Table2). These four new media contain many compounds like proteins, carbon, vitamins, minerals, salts, fatty acids, oils, and other nutrition factors \(^{48}\). While *Elettaria cardamomum* contain the some nutrition factor, is useful as good media for growth in low concentration but in high concentration cause kill of bacteria because contain antimicrobial agent for various disease moreover due to the presence of phenolic compounds, alkaloid, glycosides, saponins, tannins and other compound\(^{4}\). *Serattia marcescens* produce red pigment in all new four media but on *Laurus nobilis L.* agar cannot mentioned this pigment in the first
concentration 12.5g/l (fig.1, 2, 3, 4) (Table 1, 2). That a useful media for to rapid identified and enumerated *Serratia marcescens* because this medium contain the main compound and condition to produce the red pigment, PH, temperature, source of carbon, nitrogen and salt\(^{29, 30, 26, 27}\). All pathogenic bacteria Hydrolysis a protein is very clear in Linum usitatissimum agar that by produce protease enzyme because the media contain 18g protein/100g linum (fig.4)\(^{30}\).

### Table 1: Growth of pathogenic bacteria on plant extracts in 12.5 g/l of concentration incubated in 37C for 24 hours.

<table>
<thead>
<tr>
<th>Sample of plant</th>
<th>Acinetobacter baumannii</th>
<th>Serratia marcescens</th>
<th>Klebsiella pneumoniae</th>
<th>Escherichia coli</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Linum usitatissimum</em> seed agar</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td><em>Laurus nobilis</em> L. agar</td>
<td>+</td>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Fenugreek (<em>Trigonella foenum-araecum</em>) seed agar</td>
<td>++</td>
<td>++, P</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td><em>Elettaria cardamomum</em> agar</td>
<td>++</td>
<td>++, P</td>
<td>++</td>
<td>++</td>
</tr>
</tbody>
</table>

P : produce of red pigment; ++ : Heavy growth of pathogenic bacteria; + : growth of pathogenic bacteria; _ : No growth.

### Table 2: Growth of pathogenic bacteria on plant extracts in 25 g/l of concentration incubated in 37C for 24 hours.

<table>
<thead>
<tr>
<th>Sample of plant</th>
<th>Acinetobacter baumannii</th>
<th>Serratia marcescens</th>
<th>Klebsiella pneumoniae</th>
<th>Escherichia coli</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Linum usitatissimum</em> seed agar</td>
<td>++</td>
<td>++, P</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td><em>Laurus nobilis</em> L. leaves agar</td>
<td>+</td>
<td>+, P</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Fenugreek (<em>Trigonella foenum-graecum</em>) seed agar</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>Elettaria cardamomum</em> agar</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

P : Produce of red pigment; ++ : Heavy growth of pathogenic bacteria; + : growth of pathogenic bacteria; _ : No growth.

Figure 1: Shown growth and red pigment of *Serratia marcescens* on *Linum usitatissimum seeds* agar at 12.5g/l concentration incubated in 37°C at 24 hours.
Figure 2: Pathogenic bacteria shown heavy growth on *Laurus nobilis* leaves agar at 12.5g/l concentration incubated in 37°C at 24 hours, A. *Acinetobacter baumannii*, B. *Serratia marcescens*, C. *Klebsiella pneumoniae*, and D. *Escherichia coli*.

Figure 3: Pathogenic bacteria growth on *Laurus nobilis* leaves at 25g/l concentration incubated in 37°C at 24 hours, A. *Acinetobacter baumannii*, B. *Serratia marcescens*, C. *Klebsiella pneumoniae*, and D. *Escherichia coli*. 
Figure 4: All Pathogenic bacteria growth shown Hydrolysis a protein clear zone on Linum usitatissium seeds agar at 25g/l concentration incubated in 37°C at 24 hours, A. Acinetobacter baumannii, B. Serratia marcescens, C. Klebsiella pneumoniae, and D. Escherichia coli.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

Funding: Self-funding

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The Role of Child Sexual Abuse Victims and Pornography as the Etiology of Rape by Male Adolescents in Bengkulu Province, Indonesia

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Abstract

Introduction: Rape against adolescent girls, a big crime and unacceptable whatever its forms because it is a part of human rights violation and a serious problem in reproductive health. For victims, it definitely has profound impact on their long-term life; socially and psychologically as well. Yet, these cases throughout the world increase rapidly and massively, especially in developing countries. This study attempts to investigate the etiology of rape offenders by male adolescents in Bengkulu province, Sumatra, Indonesia.

Method: In this study, the researchers used qualitative method with 29 rape offenders as research informants (they were male adolescents less than 18 years). All informants are being sentenced at the 3 Correctional Institutions and 1 Institute for Special Child Development (LPKA). The data were collected through semi-structured interview—a technique for in-depth interview under a guidance of interview guidelines. Thus, the manuscripts of interview will be interpreted and analyzed by interrelated or intercross of sexual violence theory.

Results: The results obtained the etiology of rape offenders by male adolescents less than 18 years are caused by two factors: First, pornography exposure. Informants have been exposed by pornography exposure at various ages, between elementary and high school age. Second, victim of sexual assault. Informants have ever victimized of sexual violence where found that the perpetrators are adult people around their life. Some forms of sexual violence, such as seduction urge to visit prostitution location, having free-sex, and watch pornographic contents through internet, gadget, and computer.

Conclusion: In short, this study has set out two important findings; the rape by male adolescents less 18 years are caused by past experience of sexual assault and the role pornography exposure. Meanwhile, other behaviors allegedly relate to the factors of alcohol consumption and drugs abuse are not discussed in this study.

Keywords: Pornography, child sexual abuse, victim, adolescent, rape.

Introduction

Regarding to the rape against adolescents, its impacts and characteristic of perpetrators have been observed throughout the world. This crime, according to some research findings, sexual violence is a part of serious problem that demands massive cost consequences due to the incidence of depression, unwanted pregnancy and the resulting HIV/AIDS[1]. Many health problems
caused by causing sexual violence are not only a concern for criminal law throughout the world but also the field of public health[2]. Several studies on sexual violence showed various results regarding the incidence of child sexual violence throughout the world. As reported by a meta-analysis of child sexual violence, from 217 publications as published between 1980 and 2008 which involved 331 independent samples with a total of 9,911,748 participants. Overall, the self-report study an estimated prevalence of child sexual violence was 127/1000, whereas toward participants study a prevalence rate of 4/1000 3 was obtained [3]. The perpetrators of sexual violence, a group of adolescents age are estimated almost 20-30 percent of the total sexual crime rate [4]. Some previous studies, 1/3 of adolescents who are convicted due to the sexual crimes have repeated their actions. This recidivism violence is a significant problem in the population of perpetrators, especially adolescents who commit various sexual offenses [5].

Related to the sexual aggression, most offenders are often found by adults perpetrators (Mampuru, 2007; Zorn and Noga, 2004). While, it is very rarely found of rape offenders among adults adolescents. Many previous studies link pornography and sexual experiences, with the behavior of rape that has been carried out. Research on informant groups; sexual violations at a young age indicate that exposure to child pornography is described as having an impact on criminal behavior[4]. Meanwhile, Burton (2003) described the mechanism of the plausibility relationship between sexual violence behavior and experiences as victims of past sexual crimes, including in terms of modeling the perpetrators by victim. Sexual experience is also thought to be triggered by various factors including experience as a victim varying between 30-50%. This is conditioned as a result of combining several causes of sexual stimulation through sexual violence with signs such as the type of action that appears, and adopting permissive attitudes and beliefs about sex between adults and children [6].

According to our observation, there are many previous studies in term of rape offenders, but there have no study more specific on rape offenders by male adolescents less than 18 years. This study attempts to investigate the child sexual abuse materials as etiology of rape offenders by male adolescents. Therefore, this study investigated the etiology rape offenders by male adolescents at three Bengkulu Correctional Institutions and one Institute for Special Child Development of Bengkulu province, Indonesia.

**Method**

**Design and Participants:** In this research, the researchers were qualitative method that conducted toward male adolescents less than 18 years, they are all the perpetrators of sexual crime cases, such as rape, copulations with minor, and attempted rape. The informants consisted of 29 adolescents, and are being undergone a sentence at Correctional Institutions. The prospective informants are taken from four institutions of Bengkulu province; 12 informants of Special Child Development Institute (LPKA); 2 informants at Bengkulu Correctional Institution; 13 informants at Correctional Institution of North Bengkulu, and 2 from South Bengkulu.

**Data Collection:** Data obtained through semi-structured interviews with each participant, which is conducted within six months, from May to October 2019. The interview activity is divided into two sessions; firstly, the interview explores the general information in term of informants’ demographic data, such as age, and history of sexual crime cases. Secondly, the session interview to investigate the past history of sexual violence and pornography exposure. Each interview session took between 60 to 90 minutes. With this approach, the informant and interviewer are expected to be able to explore the experience and place it in a context. Moreover, this allows the rape perpetrators to reconstruct in-details of their past experiences. The above, the interview guide is based on the following topics; (1) history of sexual assault cases, (2) experience as a victim of sexual violence, and (3) history of pornography exposure.

**Analysis and Interpretation:** Data analysis and theoretical interpretation refer to the research problem formulation, namely: (1) how did the informant ever experience sexual violence in the past? (2) what is the history of exposure to research informant pornography? The researcher conducted a thematic analysis of the in-depth interview transcript. Furthermore, the researcher interprets the production of the meaning of rape behavior text and compares it with the findings of data from various studies and previous studies.

**Ethical Approval and Informed consent:** In this research, before and within data collection, have obtained Ethical Clearance, which issued by Health Research Ethics Committee, Nursing Faculty, Airlangga
Findings: According to our analysis on interview manuscripts, the child victims of sexual violence group are caused by two factors; first, their sexual violence history and pornography exposure experience. All above these upon in-detail are revealed in the following explanation, as follows;

Childhood and Sexual Violence: In term of child victim of sexual assaults, the results of this study revealed that unconsciously informants have ever victimized of sexual violence by adults people around them. Informants, as a prepubescent group who were less than 18 years, are mentally influenced by fantasy or sexual desire activities where they actually did not understand at all its hazard impacts on their future life, such as an influential drive to visit prostitution location, having sex with commercial sex workers, sexual engagement with older couples, and there was persuasion and influence to watch pornographic images or movies; both are free and being asked to pay some money. Thus, this study further explored informants’ history as a victim of sexual harassments, the perpetrators of sexual violence were closest people around their life; they were older people, such as cousins, adopted brothers, friends, adult partners, and commercial sex workers at prostitution location.

The case above as has elaborated from sexual violence lenses, the World Health Organization (WHO) states that sexual violence on child relates to the sexual activity where they do not fully understand and consent [7], developmentally, it is not prepared, violate the law or considered taboo in the social community outlook [8]. In the child group, sexual abuse can be in several forms or activities between children and adults or other children based on age or development in term of responsibility, trust and strength as well. The activities carried out are aimed at satisfying or fulfilling the needs of others, including activities that violate the law, but are not limited to inducement or coercion to a child to have sexual relations, the exploitative use of children in prostitution or other sexual harassment practices, and the exploitative use of children in pornographic performance and material [9].

Some findings of previous researches pointed out the childhood victim experience of sexual violence significantly played a role as deviant predictor of sexual behavior in adult sexual offenders [10]. One negative symptom of past traumatic experiences is an increased risk of criminal behavior, including sexual crimes such as rape [11]. Significantly, the effect of traumatic experience is more found in men than women [12]. Other researches identified the influence of previous trauma exposure, especially strong feelings of fear as triggers of sex offenses namely 85% of perpetrators [13].

Pornography Exposure Experience: Based on the interview results obtained some information in term of child pornography exposure experience. All informants found that they have accustomed with the exposure of pornography in various ages; between elementary and high school. They admitted to be interested to watch pornography movies and images as well due to some influences of their peers or adults people. The youtube channel is the same as gadget and computer, are often used as media to access pornographic images and movies. Importantly, for schools and home environment, especially private room as a convenient place for child to access pornography movies. Their habits in watching the content of pornography have triggered their curiosity drive, and want to know about sexual intercourse, so it further encourages them to do rape behavior.

Under article of Law number 44/2008, pornography is a picture, sketch, illustration, photo, text, sound, sound, moving picture, animation, cartoon, conversation, gestures, or other forms of messages through various forms of communication and/or media shows in public, which all contains sexual obscenity or exploitation that violates the norms of decency in society [14]. Pornography consumption can give a direct impact, such as addiction, demanding more, ignorance or being insensitive to pornographic content and coveting impingement. While for long term, it can have an impact on the creation of ‘Sexually Active Society’, which is characterized by a sexually active society (sex desacration or sex is no longer considered a sacred thing), there are no norms that regulate sexual relations and many people live as husband and wife without wedlock, or extramarital relations become unlawful, free-sex have become commonplace [15].

Some tenets of feminists, pornography causes men to rape women [13]. This theory is based on three interrelated assumptions, as follows; Sexism and male domination are depicted and celebrated in pornography, which sequentially display images of women as objects of sexual exploitation. Pornography tends to promote and legitimate sexual violence by men. It
sexually underestimates on women, which requires the fragmentation of a woman’s body and eroticization of parts of their body. They argue that pornography demeans and denigrates women, glorifies violence, and legitimizes sexism. MacKinnon argues that sexual objectification is the main root of women’s oppression[14].

According to the Cultural Spillover theory (Baron and Straus, 1987), a support for rape may not be limited to the beliefs and attitudes that directly condone sexual violence, for example the myth of rape. There may be other aspects of culture that indirectly function to legitimize rape. This can happen if physical force pattern in one area of life—for example, physical punishment at schools, mass media violence, and the use of government violence must be generalized within relations between the sexes [13], if these cases still happen, violence for non-sexual and socially agreed with the purposes will be associated with the behavior, such as rape.

**Conclusion**

This study has set out the findings, some of child rape offending have experienced at childhood violence committed by adults around them. These forms including strong drive to visit and engage sexual activity at prostitution location, and asked to make out and watch pornography as well. The habits of consuming pornography through gadget, internet cafe were found in all informants of rape less than 18 years, which began at various ages; from elementary to senior high age. It is very interesting to be concerned seriously that some places that are often used by children to access pornography content, such as school environment, private room.

**Implication for Practice and Policy:** This finding reinforces our understanding that sexual crime behavior such as rape can be triggered by past traumatic experiences; experiences as victims of sexual violence. Sexual violence can be carried out by close people around child environment such as family and adults people. Therefore, efforts are needed to improve children’s acquaintance and skills in term of the sexual violence risks, both as victims and perpetrators.

Pornography is often a latent danger whose existence which is not realized by parents. The school and home environment should be a safe place for children, it often turned out to be widely used to access pornography, through gadget and computer. Therefore, good cooperation between parents and schools is needed for preventing and controlling the consumption of pornography among children.

**Acknowledgment:** The authors would like to say high appreciation to all components, which have supported and participated in conducting this research, especially all informants in Bengkulu Correctional Institutions and Special Child Development Institute. Moreover, a big appreciation to LPDP Scholarship (Indonesian Endowment Fund for Education), Doctorate Program of Public Health Department, Universitas Airlangga, Minister of Law and Human Rights of Indonesia Republic.

**Conflict of Interest:** Nil

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FOXP3 and HER-2/ErbB2 in Breast Cancer: Finding Regulatory Links

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Abstract

The transmembrane tyrosine kinase receptor, HER2/ErbB2, has been a subject of many studies owing to its predictive and prognostic values and its being a target of antibody-mediated treatment. Retrospective evidence strongly proposes that the over expression of HER2 is related to reduced disease free and overall survival in node positive and perhaps also node negative breast cancers. Prospective attempts showed that antibodies to HER2 can form tumor responses in advanced breast cancer women which overexpress this molecule. The existence of forkhead box protein 3 (FOXP3) in cells of breast cancer is a subject of debate. We have systematically analyzed the FOXP3 expression in 20 breast carcinoma samples at transcript levels. Recent progresses in understanding breast cancer crosstalk, homing processes, tumor cell dormancy, premetastatic niche formation and finally recognition of their micromilieu cytokines, growth factors and chemokines might provide the foundation of developing targeted treatment plans potentially rendering primary carcinomas and their metastases more responsive to chemotherapies. The current review has focused on the deep connections between HER-2 and FoxP3 in context of considering the determination of both of these molecules together to rationalize or more personalize the future research directions leading to better treatment for women with breast carcinoma.

Keywords: Her-2, Breast cancer, Foxp3, Inhibit, Therapy, Trastuzamab.

Introduction

Breast cancer is a major cause of concern in women worldwide. It is responsible for an appreciable amount of morbidity and mortality in women, with every 8th women showing symptoms which sooner or later progresses into disease. Human epidermal growth factor receptor 2-overexpressing (Her-2⁺) breast Ca represents about 20–25% of breast cancer and has been shown to be more aggressive as compared to the Her2⁻. Her2 is a reliable biomarker whose overexpression is frequently correlated to poor prognosis and clinical outcomes. Trastuzumabor (Herceptin), the monoclonal antibody which targets the extracellular domain of HER2, has been long used in treating patients with Her2⁺ breast carcinoma. Nevertheless, many patients suffering from Her2⁺ tumors possess de novo resistance without response to Trastuzumab, while others developed resistance after a period of Trastuzumab therapy. Her2⁺ signaling mechanism has been extensively studied to identify additional targets to design effective treatments to Her2⁺ breast cancer patients with Trastuzumab resistance. One of such potential targets can be Foxp3 which is an important factor overexpressed in all cancers including breast cancer. Its relation to Her2⁺ signaling shows that it plays an important role in suppressing Her2 oncogene. On the contrary, Foxp3 is also a fundamental partner of Treg cells which suppresses the immune response against tumor in tumor milieu. Studies have also shown that Foxp3 inhibition in Her2⁺ over expressing breast carcinomas could be correlated with better prognosis and relapse free with general survival. Thus, Foxp3 can be envisaged as a pivotal target whose down regulation in tandem with other breast cancer targeted therapies can have astounding effects in women with breast carcinoma. FOXP3 and related mechanism have an essential role in breast cancer metastasis inhibition and such finding might introduce a new target to clinically control the metastasis of breast cancer in the
future. There is an inverse relation between expression of FOXP3 nuclei of breast tumor cells and breast cancer metastasis. Thus, targeting Foxp3+ Treg cells in the microenvironment of cancer combined with anti-Her2 treatment can be a novel strategy against breast cancer particularly chemotherapy-resistant breast cancers. In this review, we have discussed the relation between Her2 and Foxp3 and their role in breast cancer with some recent therapies targeted against them.

**HER2 in Breast Cancer:** Her2 is an oncogene which is a member in the family of human epidermal growth factor. Other members of this family are HER-1, HER-3, HER-4 and HER-2 which are involved in more than ¼ of breast cancer cells. It is present on the long arm of the chromosome No. 17 and it encodes a transmembrane tyrosine kinase receptor. The Her 2 and the other member receptors have an extracellular ligand binding site that is rich in cysteine residues, a transmembrane domain and an intracellular domain having tyrosine kinase activity. HER2 has no direct ligand.

HER2 is normally present as a monomeric receptor on the surface of epithelial cells of mammary glands at a very low level. In tumor cells, HER2 expression increases manifolds. Studies have shown that gene amplification is the reason behind HER2 overexpression. HER2 receptor is activated by ligand binding followed by dimerisation of receptor through homomeric or heteromeric binding with other EFGR receptors. Extracellular domain rich in tyrosine residues is involved in this binding. HER. Neuregulin-1, a cell adhesion molecule, is a direct ligand for HER3 and HER4 and binds with either HER3 or HER4. After ligand binding, HER2 forms heterodimer with HER4 or HER3. This dimerisation of receptor is followed by the autophosphorylation of the tyr residues of intracellular domain through the activation of tyrosine kinase activity of HER2, which turns up cascades of events that are involved in the activation of intracellular signaling pathway. Several signal transducers bind to the activated heterodimer through their src homology domain and initiate signal transducing pathways thereby, stimulating PI3/Akt or MAPK signaling pathways and various transcription factors and overproduction of VEGF. Various protooncogenes e.g c-fos, c-jun, c-myc are also activated. HER-2 over-expression thus activates multiple pathways involved in the process of metastasis. The heterodimer also degrades cell cycle inhibitor P27. Loss of P27 causes proliferation of cancer cell.

**FoxP3 and Immunosuppressive mechanisms in tumor milieu:** Forkhead (FKH) box proteins is a big transcription factor family utilized in different cellular processes. The gene encoding (FOXP3) is present on the chromosome X which contains eleven coding exons and three non coding exons. The characteristic feature of these transcription factors is the existence of a highly preserved (100) amino acids C-terminal FKH binding domains. The FKH with crystal structure domains showed that it has the DNA binding ability and described as a “wing-helix” owing to its similarity to the butterfly morphology. This highly conserved carboxy terminal FKH domain (aa 338 to 421) is responsible for DNA binding ability. The N-terminal domain of FOXP3 comprising of 2 proline-rich regions implicated to mediate transcriptional repressions. The central region of Fox3 protein comprises a zinc finger (A.A. 200-223) & a leucine zipper (LZ)-like motif (A.A. 240-261), that promotes FOXP3 homo-dimer or tetramer formation (Fig. 1).

![Figure 1](image-url)

**Figure 1:** Foxp3 domains (a) N-terminal repressor domain having tumor suppressor activity inhibiting the suppression of ErbB2 (erb-b2 receptor tyrosine kinase-2), SKP2 (S-phase kinase associated protein-2), STAT3 (Signal transducer and activator of transcription 3), c-Jun (transcription factor c-Jun), HDAC7 (histone deacetylase)
The scurfy mutant mouse strain having frame shift mutation of (FKH) box transcription factor (Foxp3) sustaining a lethal lymphoproliferative disorders causing death within an age of 3 to 4 weeks. Mutations in FOXP3 resulted in various autoimmune diseases such as hepatomegaly, splenomegaly, insulitis and massive lymphatic infiltration in liver and skin. Humans (FOXP3) mutation leads to an autoimmune disorder causing death within an age of 3 to 4 weeks. Mutations in FOXP3 resulted in various autoimmune diseases such as hepatomegaly, splenomegaly, insulitis and massive lymphatic infiltration in liver and skin. Humans (FOXP3) mutation leads to an autoimmune syndrome called IPEX (immune dysregulation, polyendocrinopathy, enteropathy and X-linked disease), syndrome termed as IPEX (Foxp-3+ Treg) cell depletion by gene mutation that encode Treg specific transcription factor (foxp3) leading to a lethal multiple organ insufficiency in its production, they absorb IL-2 from the surrounding. This limits IL-2 amount which is available for Tconv cells and as a result, leading to the activation insufficiency in its production, they absorb IL-2 from the surrounding. This limits IL-2 amount which is available for Tconv cells and as a result, leading to the activation.

**Treg-mediated suppression mechanisms:** Foxp3+ CD25+CD4+ Treg (Foxp3+ Treg cells) cells mediated Treg cell development is impaired by gene mutation that encode Treg specific transcription factor (foxp3) leading to a lethal multiple organ autoimmune syndrome termed as IPEX (Tconv) cell and lethal autoimmune disorders and affect several body tissues and organs. Treg cell depletion anti CD25 antibodies, by the in vivo antibody administrations histocompatible T-cell-deficient mice can efficiently eliminate different inoculated syngeneic cancers. Treg cell development is impaired by gene mutation that encode Treg specific transcription factor (foxp3) leading to a lethal multiple organ autoimmune syndrome termed as IPEX (Tconv) cell and lethal autoimmune disorders and affect several body tissues and organs. Treg cell depletion anti CD25 antibodies, by the in vivo antibody administrations histocompatible T-cell-deficient mice can efficiently eliminate different inoculated syngeneic cancers.

**C.T.L.A.-4 is a high effective co-inhibition molecules that is expressed by (Treg) cell and (Tconv) cell following their activations.** The C.T.L.A.-4 Treg-specific deletion in mice causes systemic high multiplication of (Tconv) cell and lethal autoimmune disorders and affect several body tissues and organs. A heterozygous C.T.L.A.-4 mutation in humans is characterized by many autoimmune symptom accompanied with Treg cells suppressive function’s impairment. C.T.L.A-4 exhibit a high affinity for (CD28) their (CD80) and (CD86) ligands. The C.T.L.A-4 which is expressed by the Treg cell will physically outcompete the (CD28) expressing (Tconv) cell to bind the (CD80/CD86) on the antigen presenting cell, therefore inhibiting the stimulation of Tconv cell. The C.T.L.A-4 on Treg cells also down modulate the (CD80/CD86) expression on the DC, hence, inhibiting the Tconv cells activation. The C.T.L.A-4 and other accessory molecules are further upregulated by the TCR stimulation of Treg cells, specially the adhesion molecules like LFA-1, whose...
deficiency compromise suppressive activity. The high L.F.A-1 and other accesssorymoleculeexpression pribefore T.C.R stimulations can lead to establish a less threshold to T.C.R-induced activations of the Treg cell[40]. The attenuated T.C.R signal may save the Treg cell from activations induced cell deaths upon their exposure to antigen, assisting them for better survival than (Tconv) cell, since such Treg cells override Tconvattumor sites. This combined effect of collective highly CD25 & C.T.L.A-4 expressions, reliance upon the exogenous Interleukine-2 and T.C.R stimulations have decisive role in the Treg mediated suppressions.

**Foxp3 and cancer:** A large number of Treg cells often infiltrate different mice & human tumors. In humans, the lung[41], liver[42], head & neck[43], breast[44], gastrointestinal tract[45] and ovary[46] tumors were shown to bear a highly numbers of tumor infiltrated Treg cell[47]. The decreased ratio of tumor infiltrating (CD8+) T cells to FOXP3+ Treg cells were correlated with bad prognosis, mainly in breast cancer patients[48], gastric[49] and ovarian cancer[50]. A previous met a-analysis published data specified that in most breast, kidneys, cervix tumors and melanoma, the highly frequent tumor-infiltrated FOXP3+ cell was associated with patient’s survival negatively[51].

**Interplay between HER2 and FoxP3 in breast cancer:** A study by Parej et al on the correlation between circulating Treg cells in Her2+ and Her2 Bc cells showed that Her2+ tumors were characterized by increased levels of FoxpTreg cells in the blood of BC patients[52]. The high levels of Treg cells have been frequently correlated with MAB or LABC. Her2+ and Her2- tumors when subjected to chemotherapy with trastuzumab alone or in combination with other drugs caused overall reduction in the Treg cells frequencies to normal levels. Some of the Her2+ patients initially responding to trastuzumab therapy exhibited disease recurrences after sometime which was correlated with increase in Treg cell frequency. A correlation between changes in circulating Treg frequency and plasma HER-ECD (extracellular domain) implied that at least some of those cells can respond to and recognize the systemically circulating (HER) proteins. Patients who respond to trastuzumab treatment by decreasing plasma HER-ECD also demonstrated flow frequency of Treg. It was noticed that HER was eliminated from blood circulation by antigen-trastuzumab complex production and uptake by phagocytic cells via combining with Fgr[53-54]. HER-trastuzumab complex formation also led to maturation, activation and reinforced antigen cross presentation by the Antigen Presenting Cell[55] and along with low Treg frequency, may possibly induce an enhanced antitumor responses.

**Foxp3 is recognized during Scurfin position cloning, which is the gene responsible for X linked autoimmunedisorders in humans and mice (Immune dysregulation, enteropathy, polyendopathy, X-linked & IPEX)[56-59].** Mice heterozygous for Foxp3sf spontaneously developed malignant tumors among which more than half were mammary carcinomas. To establish a link between mammary carcinomas and Foxp3 mutation mice, heterozygous for Foxp3sf were treated with a carcinogen, 7,12-dimethylbenz[a] anthracene (DMBA). It was observed that mutation for Foxp3sf but not for Otc sf gene leads tomainelevation in susceptibility to the mammary carcinomas. A comparison of Foxp3 expression normal and mammary epithelium from both wild-type and Foxp3sf+ mice showed that Foxp3 mRNA was identified in normal epithelium of both WT and Foxp3sf mice, but not in mammary carcinomas. This decrease in Foxp3 MRNA was concurrent with significant increase in HER2 mRNA in mammary epithelium. There was also increased HER2 mRNA expression in FOXp3sf/sf epithelium than in wild type female mice indicating a potential gene dosage impact of in vivo Foxp3 of HER2 regulation. Repression of HER2 by Foxp3 is mediated by a direct binding between Forkhead domain of foxp3 onto the promoter region of HER2. The Foxp3 binding site deletion increased the Her2 promoter activities and relieved Fox3 mediated Her2 repression. In most breast cancers, LOH alone was enough for the locus inactivation, probably owing to Xchromosome inactivation. Silencing of Foxp3 gene by Foxp3 siRNA decreased Foxp3 expression by more than (100)fold, while increasing Her2 mRNA by 7 folds. A comparison of Foxp3+ and Foxp3− cancer samples revealed that Foxp3+ samples have reduced HER2 scores compared with Foxp3− specimens suggesting a decisive role for Foxp3 in repressing HER2 expression. Further results revealed that mice heterozygous to Foxp3 mutations spontaneously developed high rates of mammary cancer. Cells where WT allele was silenced by X inactivations had inactive Foxp3 and overexpression of Her2. Most of these mutations concentrated on zing finger & FKH domains which inactivated tumor growth inhibition & repressor activity of Foxp3 (Fig. 2). It could be concluded that the FKH and Zinc finger domains of intracellular transcription factor foxp3 is directly
bound with the promoter’s region of Her2 and acts as a restraint on the transcription of her 2. Any deletion or mutation in foxp3 relieves Her2 of this restraint resulting in its overexpression ultimately causing tumorigenesis [60].

Figure (2): Schematic representation of HER2 signalling mechanism. Receptor tyrosine kinases cause dimerization of HER2 by phosphorylating at tyrosine residues which further activate various downstreaming pathways resulting in cancer. This heterodimerisation activate PI3/AKT, MAPK, PTEN and PKC pathways which further activate downstream signalling molecules P70 and AP-1 that in turn activates proto-oncogenes c-fos, c-myc and c-jun involved in cell proliferation. However PTEN has antagonistic effects on the PI3/AKT pathway.

FOXP3 prevents metastasis and inhibits angiogenesis in breast carcinoma cells: The nuclear expression levels of the protein (Foxp3) were evaluated in the cell line of breast carcinoma. Among these cell lines, S.K.B.R-3 & M.D.A-M.B-231, expressed relatively lower Foxp3 level, while T47D and M.D.A-M.B-361, expressed relatively higher Foxp3 levels. Upregulation of Foxp3 in S.K.B.R-3 and M.D.A-M.B-231 cells decreased the breast Ca cell invasion capacity, whereas, Foxp3-siRNA mediated silencing in T47D and M.D.A-M.B-361 cell had about two fold elevation in the rate of tumor invasion in comparison with the control group cells. The results suggested that Foxp3 overexpression has an inhibition impact on breast Ca cell invasions & adhesions, while Foxp3 silencings possesses an opposite impact. This could be due to the gene expression change viz. C.D.44 R.O.C.K2, E.C.M.1, D.L.G.A.P.5 and Serpine1 associated with cellular movement. Downregulation of these genes, particularly CD44, was most significant in reducing BC invasion and metastasis. C.D.44, the hyaluronic acid cell surface receptor is an adhesion molecule which has a long standing correlation with breast Ca cell invasions & metastasis [61-62]. Foxp3 mediated its inhibitory effect on breast Ca metastasis via linkage with the promoters of gene encoding C.D.44 thereby inhibiting expression of breast Ca cells [63]. An inverselyrelation between CD44 expression and foxp3 reveals that FOXP3 inhibits metastasis via downregulation of CD44 expression [64]. Chemokine CXCL12 and its receptor CXCR4 (CXCL12/CXCR4) play a main role in regulating malignant cell growth, invasion, metastasis and secretion. Foxp3 regulates CXCL12/CXCR4 expression demonstrating an inverse correlation between Foxp3 and CXCL12/CXCR4. Foxp3 showed low mRNA and protein levels in MCF-7 and MDA-MB-231 BC cell lines compared to normal breast epithelial cells. However, stable Foxp3 overexpression in MDA-MB-231 cells led to reduced CXCR4, ErbB2/HER2, SKP20 and c-MYC expression.
Thus, Foxp3 regulates breast Ca metastasis by downregulating the expression of some metastasis-related molecule including C.D.44 and C.X.C.R.4\cite{65}. In addition to its inhibitory role in metastasis, fox p3 has also been implicated to inhibit VEGF-mediated angiogenesis. It was observed that ectopic expressions of Foxp3 in M.C.F-7, T47D and M.D.A-M.B- 231 cell lines downregulates VEGF expression and that silencing endogenous FOXP3 by shRNA upregulated VEGF expression at both the mRNA and protein levels. High Foxp3 expression was a protective factor for breast cancer survival, while high VEGF expression enhances breast cancer survival (Fig. 3). Foxp3-positive samples also showed a lower blood vessel density when compared with nuclear Foxp3-negative samples. These data hypothesize that Foxp3 is negatively related to angiogenesis in breast Ca. Foxp3 inhibits breast Ca angiogenesis invitro and in vivo. This foxp3 mediated downregulation of VEGF took place by a direct interaction of forkhead-binding motifs of Foxp3 with the VEGF promoter 1.2 kb upstream of transcription start site, thus inhibiting VEGF promoter transcription and activity\cite{66}.

![Figure 3](image)

**Figure 3**: Schematic representation of role of Foxp3 as a inhibitor of oncogenes ERBB2 and SKP2 which cause breast cancer. Foxp3 also inhibits VEGF which is an important factor responsible for angiogenesis and metastasis to distant organs. Contrary to these Foxp3 maintains the expression of p27 a cell cycle inhibitor gene, thus exerting tumor suppressive function. Both ERBB2 and SKP2 inhibit expression of p27.

**Therapies targeting FOXP3**: In immunotherapy, the major hurdle is the T cell expressing Foxp3. Foxp3 is an intracellular transcriptional factor. It has been observed that the regulatory T cells elevate the breast cancer by suppressing the antitumor immunity. According to the research work carried out by Takeuchi, the tumors which are not recognized earlier by regulatory T cells triggers a strong antitumor response resulting in the blockage of several immune checkpoints. Thus, in order to elevate the efficacy of vaccines, Foxp3 expressing T regulatory cells are needed to be suppressed\cite{67}.

**Antigen, antibody, peptide or protein**: In their study, Devi and Nath prepared novel vaccines containing synthetic mRNA encoding Foxp3 antigen and delivered them into dendritic cells. Upon transfection or pulsation the peptides of tumor antigens, total protein or total mRNA isolated from tumor cell, DNA encoding specific tumor antigens or synthetic tumor-antigen-encoding mRNA entered into dendritic cells. These tumor antigen-associated dendritic cells resulted in
subsequent generation of mature dendritic cells, which could efficiently elicit tumor antigen specific cytotoxic T lymphocytes fundamental in destruction of cancer cells[68].

A synthetic peptide P60 and antitumor DC vaccines were used to treat mice bearing LM3 and 4T1 tumors. P60 monotherapy was shown to inhibit tumor growth in immunocompetent in addition to the immuno-compromised animals, primarily by inhibiting the secretion of immune-suppressive cytokine IL-10 secretion in FOxp3 expressing breast carcinoma cells. Furthermore, combined treatment with antitumor dendritic cell vaccines and P60 increased the therapeutic efficacy of these vaccine in experimental models[69].

**Conclusion**

The important role of FOXP3 as a tumor suppressor is evident by the fact that it not only represses HER2 and SKP2 breast cancer oncogenes, but also inhibits VEGF a pivotal player causing in angiogenesis and metastasis. However, it has totally contrary role in tumor milieu where its presence on the tumor infiltrating Treg cells results in suppression of anti-tumor response. As such patients initially respond to chemotherapeutic drugs develop resistance over a period of time. Patients who have Her-2$^+$ over expressing breast cancer with primarily response to gradual trastuzumab acquired resistance. Foxp3 mediated inhibition of Her2 signaling mechanism has been extensively studied to identify additional targets to design effective treatment to those patients with drug-resistant Her2$^+$ breast Ca patients. Studies have also shown that Foxp3 inhibition in Her2$^+$ overexpressing BC could be correlated with better prognosis and overall and relapse free survival. Thus, Foxp3 can be envisaged as a pivotal target whose down regulation in tandem with other breast cancer targeted therapies can have astounding effects in BC patients. A synergistic inhibition of Foxp3 in tumor milieu and anti-HER2 therapy on similar lines with anti-HER-2 and anti-VEGF therapy in HER2-positive breast carcinoma can be developed. Foxp3 can be envisaged as an important future candidate in designing an effective therapy against HER2- overexpression particularly drug resistant HER2- overexpressing breast cancer.

**Conflict of Interest:** None

**Source of Findings:** None

**Ethical Clearance:** None

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Molecular Identification of the Dermatophytes Causing Tinea Diseases Using ITS Sequencing Analysis

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Abstract

Background: Tinea is a group of keratinophilic fungal infections caused by dermatophytes that invade the skin, hair, and nails. As the conventional methods for dermatophytes detection are time-consuming or lack enough specificity, accurate diagnostic methods such as molecular techniques are required for precise identification and differentiate between two closely related species of dermatophytes.

Objective: To disclose the useful role of DNA sequencing in the recognition of dermatophytes using the ITS region and comparing the current local isolates with those provided by the NCBI.

Method: Thirty clinical tinea specimens were collected from the patients between December 2016 and June 2017. All specimens were examined microscopically then cultured on DTM. Positive dermatophytes’ cultures were confirmed by PCR using ITS1 and ITS4 primers. The PCR products were sequenced for species-specific dermatophyte identification.

Result: Culture results of 30 specimens revealed predominant positive dermatophytes (23, 77%) comparing the rest of no growth. The PCR amplification of the 23 dermatophytes for species identification showed distinct fragment lengths for different species; 550bp for T. tonsurans and T. equinum, 650bp for T. verrucosum, T. bullosum and M. appendiculatum, 690bp for T. rubrum and T. mentagrophytes, 700bp for T. interdigitale, and 740bp for M. canis and E. floccosum. Sequencing analysis exhibited a novel local T. rubrum strain that recorded in the NCBI with accession number (MG786552.1). The genetic compatibility between the reference strain of T. rubrum in India and the local strain was 99%.

Conclusion: Dermatophytes identification by sequencing analysis of the ITS region is a faster, precise, and more dependable diagnosis at species and subspecies levels than the conventional laboratory methods.

Keywords: Dermatophyte, PCR, ITS, Sequencing.

Introduction

Tinea (dermatophytosis) is a mycotic infection brought about by dermatophytes; filamentous fungi invading the keratinized tissues of the skin, hairs, and nails. Dermatophytes are restricted to keratinized layers as they have keratinase enzymes and require keratin for growth[1]. Dermatophytes affiliated to the genera “Trichophyton, Epidermophyton, and Microsporum”, with two possible infections pathways, directly (person to person contact) and/or indirectly (animal to human contact)[2]. Tinea, dependent on the affected site, has been clinically classified into “Tinea capitis (head), Tinea barbae (beard), Tinea corporis (body), Tinea manuum (hand), Tinea cruris (groin), Tinea pedis (foot), and Tinea unguium (nail)”[3]. Direct microscopy of clinical tinea specimens is a speedy method for fungal structures recognition, but it is non-specific and less precise[4].
Cultivated dermatophytes can be pinpointed dependent upon various morphological hallmarks like colony pigmentation, texture, outgrowth rate, and presence of conidia, hence culture is important for both therapeutic and epidemiological studies [5]. Besides, the conventional laboratory methods for dermatophytes detection is either slow or lack enough specificity, and in sometimes the cultural features were unpredictable, thus the perfect diagnostic methods for dermatophytosis should be simple, specific, rapid, and cost-effective [6]. Molecular methods for discrimination between the genotyping characteristics of the dermatophytes species are more specific, precise, rapid, and differentiate between two closely related species as well as are less likely to be affected by external influences such as temperature and chemotherapy [7]. Molecular techniques also provide a better understanding of classification, epidemiology, and ecology. Recently, the diagnosis of dermatophytes dependent on DNA amplification and sequencing analysis of the internal transcribed spacer (ITS) regions [8].

The ITS regions of the ribosomal DNA (rDNA) gene in the dermatophytes were used as a reliable marker for species identification. Also, the ITS region is a chunk of unusable RNA existing amidst formational ribosomal RNA (rRNA) on the universal predecessor transcript [9]. The ITS region is highly changeable even between closely related species of dermatophytes and the sequence consistency of its region is vastly utilized in taxonomy and molecular phylogeny as it can be amplified effortlessly even from little amounts of DNA (as a result of many rRNA genes copies) [10]. As mentioned earlier, the current study aimed to discover the beneficial role of DNA sequencing in the recognition of dermatophytes causing tinea diseases utilizing the ITS region and matching the current local isolates with those provided by National Center Biotechnology Information (NCBI) data.

**Materials and Method**

Subjects: Twenty-three clinical tinea specimens (skin scrapings, nails and hair clippings) were collected from patients, irrespective of age and gender, attending the Dermatology Department of Kadhimiya Teaching Hospital/Baghdad between December 2016 and June 2017. The clinical identification of tinea was performed by a specialized dermatologist, and the patient’s medical history was recorded using a self-administered questionnaire. However, a proper explanation of the study was addressed to the patients and the consent was taken from them before the collection of the sample.

The specimens were examined microscopically after treating with 20% potassium hydroxide. The specimens were also cultured on Dermatophyte Test Medium (DTM) (HiMedia Laboratories, India) and incubated at 28°C for 2-4 weeks. Dermatophytes were disclosed based on a color change in the DTM due to their ability to produce alkali substances that promote the pH and change the medium’s phenol red from yellow to red [11]. DNA extraction performed for positive dermatophytes’ cultures using Fungal/Bacterial DNA MiniPrepTM kit (Zymo Research, USA), DNA extraction of an appropriate amount of fungal cells by bead bashing method, which depends on disruption of the cell wall by beads according to the manufacturer instructions. Extracted DNAs were electrophoretically on 1% agarose gel to determine DNA bands through which observed by UV transilluminator. Thereafter, DNAs were amplified by polymerase chain reaction (PCR) using universal primers; a forward primer (ITS1 F: 5′- TCCGTAGGTAACCTGCGG-3′) and a reverse primer (ITS4 R: 5′-TCCTCCGCTTATTGATATGC-3′). Primers set supplied by Integrated DNA Technologies (IDT Company, Canada). The PCR amplification was done using a Thermal Cycler (Gene Amp, PCR system 9700, Applied Biosystems, USA) in a total volume of 25µl consisting of 1.5µl DNA, 5 µl Taq PCR PreMix (Intron, Korea), 1µl of each primer and 16.5µl of nuclease-free distilled water. Thermal cycling conditions were applied as: Denaturation at 94 °C for 3 min, followed by 35 cycles of 94 °C for 45s, 52°C for 1 min and 72 °C for 1min with final incubation at 72 °C for 7 min. The PCR products were analyzed after RedSafe™ staining by 2% agarose gel electrophoresis alongside DNA Ladder (100 bp). Sanger sequencing of gene performed by National Instrumentation Center for Environmental Management (NICEM) [12] (biotechnology lab, DNA sequencer 3730XL, Applied Biosystems, USA). A homology search was conducted using the Basic Local Alignment Search Tool (BLAST) program that is available at NCBI (online at https://www.ncbi.nlm.nih.gov) and BioEdit/MEGA6 program for multiple sequence alignment, and the sequences result compared with NCBI control strains.

**Results**

The clinical distribution of the types of tinea was illustrated in Figure (1), with higher prevalence of Tinea
corporis (8, 26.7%), Tinea pedis (7, 23.3%) and Tinea capitis (6, 20.0%) compared to other types of Tinea among the 30 cases included in this study.

Figure (1): Clinical distribution of Tinea types among thirty cases in this study.

Figure (2) showed the cultivation results of Tinea cases on DTM. Among 30 clinical cases in this study, 23 (77%) predominant positive dermatophytes cultures contrasting 7 (23%) of no growth.

Figure (2): The cultivation results of thirty clinical tinea cases on DTM.
DNA sequencing analysis of highly variable ITS regions (ITS1 and ITS2 and the 5.8S gene) was applied for 23 PCR products of dermatophytes isolates. This study revealed a predominant T. Mentegrophytes (22%) and E. floccosum (17%) followed by T. tunsurans, T. bullosom, and T. rubrum (13%, 13%, and 9% respectively), comparing M. appendiculatum, M. canis, T. equinium, T. interdigitalie, and T. verrcossum with lower prevalence (4% for each one). The current study exhibited a novel T. rubrum strain that recorded in the NCBI with accession number (MG786552.1) as illustrated in Figure (4). The genetic compatibility between the reference strain of T. rubrum in India and the novel strain in the current study was manifested in Figure (5), through which the compatibility percentage between these two strains was 99%.
*Trichophyton rubrum* isolate RM7 internal transcribed spacer 1, partial sequence; 5.8S ribosomal RNA gene and internal transcribed spacer 2, complete sequence; and 28S ribosomal RNA gene, partial sequence. Sequence ID: KF437402.1

**Figure (4):** Sequencing analysis of the novel local *T. rubrum* strain in Iraq compared with the NCBI.

**Figure (5):** Phylogenetic tree of the novel local *T. rubrum* strain sequences in Iraq (Mega v.6).
Discussion

Identification of dermatophytes at the species level is very important not for diagnosis only but for therapeutic strategies since the conventional diagnostic procedures for dermatophytes detection are slow, lower specificity, and further testing was required to confirm their identity. Misidentification also was one of the main reasons that make the dermatophytes among the first fungal groups studied using molecular techniques.

In this study, thirty clinically diagnosed specimens of patients with different types of tinea infections were collected and cultivated on DTM as differential and selective medium for dermatophytes. The current findings demonstrated that 23 among 30 clinical specimens were positive (red color change) for dermatophytes. These results were in harmony with a study by Singh et al. in India [13], which revealed that DTM is a well reliable media for eczicent incipient isolation, and early discernment, of dermatophytes. The failure of the growth of 7 specimens on DTM might be due to the utilization of antifungal or corticosteroid drugs before specimen collection, clinical misdiagnosis, or inadequate specimen [14]. Besides, the vying between the dermatophytes and the escorted saprophytes at the lesion sites may disserve and forbid the growth of the dermatophytes on agar media [15].

Molecular techniques are more advantageous for dermatophyte identification as they are rapid, highly sensitive and specific. Moreover, these methods depend on genetic character, which is more persistent than phenotypic features, and they can identify atypical dermatophytes that could not be recognized by culture-based techniques [16]. The PCR technique has rapidly become one of the most widely used techniques in molecular biology for its high discriminatory power and reproducibility, because it is rapid, simple and requires very little specimen materials [17]. Twenty-three dermatophyte isolates were confirmed using PCR for species identification. In the PCR, the ITS region was amplified using the primers ITS1 and ITS4. As expected, the fragment size of PCR products from different species showed different lengths. The size of the amplified product was approximately 690 bp for *T. rubrum* and *T. mentagrophytes*, 740 bp for *M. canis* and *E. floccosum*, 650 bp for *T. verrucosum*, *T. bullosum* and *M. appendiculatum*, 550 bp for *T. tonsurans* and *T. equinum*, 700 bp for *T. interdigitale*, whereas 770 bp for *Microsporum sp.*. These study results were consistent with several studies using PCR as a reliable technique for species-specific identification of dermatophytes, which mentioned that molecular methods utilize ITS regions are more accurate, specific, and effective in the rapid recognition of dermatophyte species in clinical and epidemiological approaches based on the fragment size length ranging from 550 to 740bp [18,19].

DNA sequencing, in this study, was applied for the PCR products, via the maximization of the ITS region in the rDNA gene. The ITS is a powerful significant marker through which it can manage with phylogenetically congenerical extra far fungal species. The PCR products were sequenced in South Korea (Macrogen lab) as a standard sequencing service. Sequence analysis of the more variable ITS region is the beneficial discernment assay for dermatophytes’ species recognition displaying highly pleomorphism of ITS region inside the same genus as well as it’s a potential tool to resolve the phylogenetic relationships within the family Arthrodermataceae [20].

The ITS region of the “nuclear ribosomal DNA repeat unit” is frequently sequenced for enquiries of systematics and taxonomy within the genus/species levels. The region 650bp can be gained via a single run of DNA sequencing and of its sub-regions (ITS1 and ITS2 and 5.8S gene) which manifested a supremely developmental degree of species specificity [21]. In current study, the ITS1F and ITS4R primers were used to amplify the spacers ITS1 and ITS2 to characterize fungal abundance and diversity. Among the 23 sequenced dermatophytes, a novel *T. rubrum* strain was identified and recorded in the NCBI with accession number MG786552.1, which was isolated from the groin of an adult male with Tinea cruris that lived in a rural area. As mentioned, the nucleotide sequencing revealed that the genetic variations happened in a single region, with one transition only at the position (491) that convert it from Guanine (G) to Adenine (A).

This study also demonstrated a highly similar percentage (99%) of genetic affinity between the recorded isolate and the NCBI, and the phylogenetic analysis figured out the high compatibility percentage (about 99%) between the local novel strain of *T. rubrum* in Iraq and *T. rubrum* strain in India. Interpretation of this result, in our opinion, might be due to Indian arrivals to Iraq who had tinea and their admixture with Iraqis resulting in the transmission of tinea infection. Thus, the coinfection of the two distinct strains of *T. rubrum* leads to genetic mutations with the emergence of a new strains.
 Conclusion

Dermatophytes identification by sequencing analysis of the ITS region is a faster, precise, and more dependable diagnosis that can replace, with facilities supported, the conventional methods. Also, this technique becomes essential for correct recognition of dermatophyte species for proper therapies, realize the source of infection, and the epidemiology of uncommon dermatophyte species.

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References


The Welfare State: Construction of the Caliphate System and the Indonesia Constitutional Citizen Health and Social Rights

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Abstract
The caliphate system is a system which is known to only acknowledge a government or a state leadership as legal if its governance uses the Islamic law as the absolute law, meanwhile other laws such as the positive law (the law which is applied in Indonesia) is deemed as a form of governance which is against Islam. Such understanding is clearly contradictory to the Indonesian Constitution (the 1945 Constitution). In the Indonesian Constitution, it has stated that the implementation of the government or the authority is based on the constitution supremacy. All forms of governance or application of authority (in the state) refer to the norms created by the state through the mandated organizations.

Keywords: Constitution, caliphate, system, state, law.

Introduction
The pro and contra on the caliphate system have often filled the field of public discourse. The group who claim to be pro to this system believe that the caliphate system is suitable to be applied in Indonesia, and should be used as the ideology. This group does not want Pancasila (the five principles which make the ideology of Indonesia) to be the ideology of the state, and they believe that the caliphate system is deemed to be more suitable.

Meanwhile, in Indonesia, there is another group who disagrees if the caliphate system becomes the ideology. The group of people sternly rejects the belief of Pancasila, which has already become the vision and the ideology of the nation, which is to become the welfare state. We can see the difference between the caliphate system and the Pancasila system regarding the welfare state, especially when discussing about health assurance.

There is a common concern which happens everywhere due to some active promotions on the caliphate system. They believe that the governmental system which is applied in Indonesia is against Islam and that the government has failed in creating a social life which is peaceful, fair, and prosper. In this paper, the formulated problems are, in reality, how is the urgency of the welfare state and the fulfilment of the people’s health rights in constitution? Then, in reality, how is the caliphate system and why is the constitution (the 1945 Constitution) more suitable than the caliphate system to be applied in Indonesia?

Research Method
This study used a juridical normative method with a qualitative descriptive approach. Descriptive method is used to describe and explain the factual conditions of the research to find out the solution.

Discussion
The Urgency of the Welfare State in Constitution as the Life of a Nation: In a political community which is organized correctly, the existence of a state is for the people; and this is known as the welfare state. The people who formulated the state cannot establish their own affairs without the highest arbitrary power¹. From this stately construction, many forms of roles are run by some institutions or some people to achieve or to reach the goal which is idealized by the state.

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There were some amendments of the 1945 Constitution in the form of quality and quantity\(^2\). The many rights of the people which were beforehand non-existent in the constitution, are inserted in the amendment, including health rights which are crucial in a welfare state.

In essence, the main function of the Constitutional Court is to guard and to protect the constitution. It is a correction of the governmental experiences in the past which was caused by multiple interpretations of the Constitution\(^3\). Its function is so that the constitution may always become the “holy book” in the nation. The Constitutional Court’s ideal formation cannot be separated from the judicial review\(^4\).

The existence of the judicial review is to avoid the possibility for constitutional products to bring loss to the people’s interests\(^5\) or to destruct the constitutional rights of the people. Thus, constitution’s constitutionality must be tested as follows: first, the Constitution is a political product of two institutions, which are the president and the People’s Representative Assembly, who are chosen by the majority of the people based on the rule by majority principle, where there is no guarantee of its righteousness and justice based on the 1945 Constitution. Second, the people’s wills are reflected in the 1945 Constitution, meanwhile the Constitution reflects the wills of the political elites in the parliament\(^6\). Karman stated that the constitution is the people’s law, thus it must contain stipulations of the welfare state, including health rights\(^7\).

If the constitution is violated, it will surely disturb the position of the state as a welfare state, which is fundamental. It has the potential to threaten the constitution and the people’s welfare\(^8\). This condition has the potential to hurt the ideals that the constitution is “a higher order law (which) will generally be entrenched,”\(^9\). This construction must be protected by all who are subjects of this nation.

**The Construction of the Caliphate Welfare Paradigm:** The Indonesia ideology system is Pancasila and the welfare state. As a governmental system, the caliphate system is created by human beings, where its contents vary from time to time and from one place to another. In Islam, there is no standard in the governmental nor stately systems. The Muslims of Indonesia are allowed to have a governmental system which is according to the needs and the reality of the Indonesians themselves\(^10\).

The Islamic scholars who participated in establishing and in developing Indonesia as welfare state stated that the state of Pancasila is a final choice and that it does not contradict with the Islamic sharia. Thus, it must be accepted as the noble agreement of the state\(^11\). With all costs, Pancasila must be upheld as the ideology of the state. If seen from the philosophical aspect, all legal systems of Indonesia cannot be separated from the belief that Pancasila is the *Philosophische Grundslag (Grundnorm)*\(^12\).

In the aspect of Indonesia’s life as a state, it can be implemented by adapting and harmonizing the values of Pancasila as the *philosophische grundslag (grundnorm)* and the 1945 Constitution as the *staatsfundamentalnorm*. Both of them are the to be applied in the society, the state, and the nation for the people’s welfare. If this harmonization is applied well, the state won’t easily be broken by other strengths, including those who are consistently preaching the caliphate system as the most correct system.

Hasan states that human beings have the mandate of “welfaresjip”. The doctrines of the Quran state that humans are the only creatures who are given the mandate from God to manage and to use the natural resources and the welfare as “God’s caliph on earth”. It gives human beings the rights for exploration, exploitation, and also the usage of those resources in the efforts to fulfill their needs and to increase the quality of their lives. But humans must be responsible in using those rights\(^13\). This is based on God’s order, “It is He who has made you successors on the earth, and raised some of you in rank above others so that He may test you in respect to what He has given to you.” (The Holy Quran, al-An’am, 6: 165). The reference from the Qur’an above gives guidance to the humans to carry out their activities as “God’s caliph on earth” (*khalifah fil ardl*) beneficially, for example by developing a governance which is transparent and accountable, natural resource usage based on ecological protection, and also protecting the rights; including the health rights of all human beings who embrace variative religions. Every person has the right for prosperity and the right for health rights. This is because this country is a welfare state which embraces diversity and multiple cultures. Thus, all citizens constitutionally have the obligation to respect and to protect each other.

Ucok Unpad states that Indonesia is built based on the agreement of all parties. Its land is spread from Aceh to Merauke. Its foundation is made from five principles
which are explored from the history of the nation. Meanwhile, it is formed by bricks which are made of the various ethnicities, tribes, cultures, and religions with all of their pluralities, which are layered by the cement of mutual desire and mutual feelings due to colonialism, to live together as a nation. This means that it is not right to say that Indonesia is only owned by a group of people. Indonesia is one for all and all for one.

As a comparison, Prophet Muhammad (peace be upon him)’s manner in developing the people or the “state” (the government) is based on the people’s welfare. He acknowledges and upholds diversity. He does not state that the caliphate system is to develop the people. In many aspects which regard the society and the state, Prophet Muhammad was very democratic in delegating members of the society who have particular expertise, like what he stated, “You have better knowledge of the affairs of your world.” (Sahih Muslim 2363). His statement shows there are many potentials and specialness in every human being with all of their diversity in culture, religion, politics, health, education, etc.,

Mahfud also suggested a similar opinion. He states that there is no standard system in the primary sources of Islam. Everything is up to the people according to the condition of the society and the development of the era. The proof is that there are different governmental systems in the Islamic world. There are those which use the kingdom system, the emirate system, the sultanate system, the republic system, etc. This shows that there is not one system which is deemed as correct in the construction of Islam’s governmental system, as all nations have the right to apply the systems which are acknowledged based on their ijtihad as the system which is most suitable and most beneficial for the people and the nation.

The Indonesian constitution and its Pancasila may give the best towards the welfare and health rights in the life as a nation compared to the caliphate system. Wahid, Indonesia’s former president, stated that the acknowledgment and the acceptance of Pancasila as the principle of the government is carried out through religious means. This means that it positions religion and Pancasila in their own places, without contradicting one and another.

Pancasila is the ideologic-constitutional basis. Then, the Islamic aqidah (the Islamic articles of faith) according to the Ahlussunnah wal-Jama’ah paradigm is the basis of faith. They cannot be contradicted between one and another. This is because in essence, someone who has the principle of Pancasila, has the belief on the Almighty God (in this case bringing one of the basic principles in Indonesia).

Mahfud explained that these systems are different from the system of a Pancasila state, which already has a standard until its institutionalism. It is a product of ijtihad which is developed based on the reality of the plural Indonesian people. It is identical to when Prophet Mohammed built the State of Madinah. It is dangerous if the supporters of the caliphate system often state that the Pancasila system of governance has failed in developing justice and prosperity.

The supporters of the caliphate system or paradigm do not understand that the Prophet’s successful standard in developing Madinah was not because he applied the caliphate system. Yet, this is because the Prophet was able to protect and to apply justice to all groups or tribes. This is similar to the condition in Indonesia. If this country is not yet in welfare, nor has it established a strong and a clean government, it is not because of the constitutional system or the Pancasila ideology. But it is caused by the factor of leadership and bureaucracy. At this time, it is difficult to form a social condition or a governmental construction like in the Prophet’s era.

In Madinah, the Prophet took strategic steps from the social, political, and cultural aspects. He unified the groups of people and the tribes in Madinah and those surrounding it, even though they had different traditions and embraced different religions. The diverse people and the various tribes were invited to make a type of “political contract” to live together, to respect and to help each other, to guard Madinah from all kinds of external threats, and to work together in a peaceful and a respectful manner. This is proven from the guarantee that they still have the freedom to run specific religions and to worship according to their religions. The political contract was signed by the tribes of Aun, Haris (Khadraj), Sa’idah, Jusyam, Najjar, Amru, Nabit, Aus, Tsa’labah (Jewish), Syathbiyah (Jewish), Jufnah (Jewish), etc. They agreed to develop the state based on the pluralistic people which is not based by the caliphate system. Yet, it is based on a political agreement to emphasize universal interests, not according the interests of a particular person or a particular group.
The construction of the state of Madinah becomes a great lesson in the field of the governance system. It teaches us that a system cannot be separated from the reality of the people’s social life. The people’s condition of plurality or diversity has great influence on the system’s construction. The caliphate system cannot answer the needs of the Indonesian people. Only a little may be fulfilled by the caliphate system. The caliphate system may also bring a disaster to the Republic of Indonesia, as it may divide the state’s construction of unity.11

If these constitutional norms are obeyed by all citizens, thus the construction of Indonesia’s dignity may be parallel to the “state of Madinah”, as formed by Prophet Muhammad. This is because complying with the constitutional norms means running the basic religious, humane, social, and national norms responsibly.14

In a story, Caliph Umar reminded the Priest on the meaning of pluralism and the freedom in religion or the inclusive-humanistic relations with God, when the Caliph rejected the Priest’s offer for the Muslims to pray in the church. His reason was that he was afraid that there will be some people who will act radically and try to destroy the worshipping place of people from other religions in the future, if he was to pray there.

For Caliph Umar, a place of worship is a sacred reflection which is principle for a religious community. Thus, when the Priest offered him to pray in the church, the caliph did not only think about the religion that he embraced. Yet, he also showed a political-religious behavior which is wise, clear, democratic, and prospective-humanistic, that must be enforced by all religion-embracers in the future.

Conclusion

In the construction of the constitution (the 1945 Constitution), it is clear that the constitutional right to embrace a religion or to believe upon certain paradigms which are thought to be correct is guaranteed. Even so, it does not mean that every system which is against Pancasila may be freely spread and developed. The Indonesian constitution also stated clearly on the welfare state and other rights including the health rights for the people.

In Indonesia, the caliphate system is an unconstitutional system. Such caliphate system is clearly not in line with the constitution of the Indonesians. It is true that the majority of the Indonesian people are Muslims. But they have agreed that the governmental or the state leadership is implemented based on the constitutional supremacy, instead of the caliphate paradigm or system. All kinds of power establishment and governance (in the stately life) is based on the constitution as its “holy book”.

The most important aspect of a stately system is how it gives benefits to the people. It is about how the rights of the citizens, including the health rights, justice, and equality rights are formulated and granted to the citizens. In the Indonesian constitution, the welfare state formulation has been stipulated sufficiently for the sake of the Indonesian people.

Conflict of Interest: No

Source of Payment : Author

Ethical Clearance: Yes

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The Governmental Regulation No. 2 of 2020 and the Head of the Region General Election in the Pandemic ERA: Between the Health Protocol and Cluster Disaster of the Regional General Election

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Abstract

**Objective:** The organization of the regional general election during the Covid-19 pandemic surely creates threats towards the citizens’ right to live, which is guaranteed by the constitution. It is not easy to guarantee the safety of the organizers as well as the voters and to build a discipline in running the health protocol during the regional general election. This paper aims to describe such condition.

**Method:** This research uses the juridical-normative method with the descriptive-qualitative approach.

**Result:** There needs to be a tight and a measured health protocol which is able to prevent the turning of the regional general election into an arena of mass Covid-19 infection. It is important to strengthen the regulation in the form of prohibitions and sanctions in violating the protocol.

**Conclusion:** The General Election Commission and the government must act strictly to every violation of the health protocol, as it endangers many people. There must be clear regulations on the prohibition of the general election campaign and activities which involve many people in the red areas, and campaign limitations in the green areas.

**Keywords:** Election, regional head, pandemic, health protocol.

Introduction

The global spread of the coronavirus disease (Covid-19) has significantly increased from time to time. Indonesia is also one of the countries which has been impacted by this pandemic. Considering the dangers of this disease, through the mandate stipulated in Article 12 of the Republic of Indonesia’s Constitution, the President has issued the Decree of the Republic of Indonesia President No. 11 of 2020 regarding the Determination of a Health Urgency. Referring to the analysis of an urgent law of governance, the determination of this urgent condition is still in the *staatsnoodrecht* scope, where the state is obliged to issue some policies to face the urgent situation. The implementation of that policy is written in the Large-Scale Social Restrictions in the form of restrictions which have started to be implied and suggestions to avoid activities which involve many people. Recently, the government has applied the policy against homecoming during great religious celebrations to cut the chain of the covid-19 pandemic infections.

Even though it brings many critics, the government has decided to organize the Regional General Election on December 9th, 2020¹. It means that this event, which is organized once every five years, will be organized...
during the Covid-19 pandemic. The Regional General Election stages which were beforehand stopped due to the Covid-19 pandemic have now been continued. Article 8B of the Regulation of the General Election Commission No. 5 of 2020 states explicitly states that, “Execution of the simultaneous voting which was before postponed due to the non-natural disaster of the Coronavirus Disease 2019 (Covid-19), will be carried out on December 9th, 2020”. This Regulation of the General Election Commission is an explanation of the order of Article 201A clause (2) of the Governmental Regulation in Change of the Constitution No. 2 of 2020, which states that, “Execution of the simultaneous voting which was before postponed as mentioned in clause (1) will be carried out on December 20202.

Based on the data from International IDEA (Institute for Democracy and Electoral Assistance), during the period from February 21st to July 19th 2020, there were at least 67 countries and territories in the whole world which decided to postpone national and sub-national general elections due to the Covid-19 pandemic. From this number, at least 23 countries decided to postpone national general elections and referendums. On the same period, 49 countries and territories have decided to execute the organization of national or regional general elections as planned beforehand, From the 49 countries which organized those general elections during the pandemic, there are of course stories which may be extracted and turned into valuable lessons.

The countries which still choose to organize the general elections during the Covid-19 pandemic had experienced many challenges. One of the most difficult challenge is “the responses of the citizens” who are voters in those elections. There is the risk of a Covid-19 infection to the citizens, which is a main consideration which must be answered by the government. The state, through the government, must give a guarantee of safety to their citizens, so that the suffrage rights may be carried out safely and comfortable. The government must make sure that the head of the region general elections will not be a place where the coronavirus disease spread to the citizens with the clusters of the heads of the region elections. Because of that, the General Commission of the General Election (KPU) chooses to decrease the target of the voter participation ratein the heads of the region elections3.

### Table 1: Participation Rate of Voters in Countries of Territories which Conducted an Election during the Pandemic

<table>
<thead>
<tr>
<th>No.</th>
<th>Country</th>
<th>Type of Election</th>
<th>Execution Date</th>
<th>Participation Rate</th>
<th>Previous Election Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Iran</td>
<td>Parliamentary</td>
<td>February 21st, 2020</td>
<td>42,32%</td>
<td>60,09%</td>
</tr>
<tr>
<td>2</td>
<td>Dominica Republic</td>
<td>Presidential</td>
<td>March 15th, 2020</td>
<td>55,18%</td>
<td>67,77%</td>
</tr>
<tr>
<td>3</td>
<td>Vanuatu</td>
<td>Parliamentary</td>
<td>March 19th, 2020</td>
<td>51,29%</td>
<td>56,47%</td>
</tr>
<tr>
<td>4</td>
<td>Guinea</td>
<td>Parliamentary</td>
<td>March 22nd, 2020</td>
<td>58,04%</td>
<td>63,53%</td>
</tr>
<tr>
<td>5</td>
<td>Queensland, Australia</td>
<td>Local General Election</td>
<td>March 29th, 2020</td>
<td>77-78%</td>
<td>83%</td>
</tr>
<tr>
<td>6</td>
<td>Mali</td>
<td>Parliamentary</td>
<td>March 29th, 2020</td>
<td>35,58%</td>
<td>38,50%</td>
</tr>
<tr>
<td>7</td>
<td>South Korea</td>
<td>Parliamentary</td>
<td>April 15th, 2020</td>
<td>66,21%</td>
<td>58,03%</td>
</tr>
<tr>
<td>8</td>
<td>Serbia</td>
<td>Parliamentary</td>
<td>June 21st, 2020</td>
<td>48,93%</td>
<td>56,07%</td>
</tr>
<tr>
<td>9</td>
<td>Iceland</td>
<td>Presidential</td>
<td>June 27th, 2020</td>
<td>66,92%</td>
<td>75,67%</td>
</tr>
<tr>
<td>10</td>
<td>Croatia</td>
<td>Parliamentary</td>
<td>July 5th, 2020</td>
<td>46,90%</td>
<td>52,59%</td>
</tr>
<tr>
<td>11</td>
<td>Singapore</td>
<td>Parliamentary</td>
<td>July 10th, 2020</td>
<td>95,81%</td>
<td>93,70%</td>
</tr>
<tr>
<td>12</td>
<td>Poland</td>
<td>Presidential</td>
<td>July 12th, 2020</td>
<td>68,18%</td>
<td>55,34%</td>
</tr>
</tbody>
</table>

Source: International IDEA

In some other states, there is a decrease of the participation rate of the election when organized during the Covid-19 pandemic. These countries are Iran, Dominica Republic, Vanuatu, Guinea, Mali, Serbia, Iceland, and Croatia. In Iran, the voter participation rate was only 42,32% from the total of 57,918,000
registered voters. On the previous general election on 2016, the voter participation rate in Iran reached 60.09%. A similar thing also happened in Serbia, where the level of voter participation only reached 48.93% from the total of 6,584,376 registered voters. On the previous general election on 2016, the voter participation rate reached 56.07%. Even though the majority of countries experienced a decrease in the participation rate, there are also other countries which experience an increase, which are South Korea and Poland.

This data means that the Indonesian government and the KPU must work hard to increase the general election participation even though they are faced with the risks of the pandemic. It is not easy to guarantee the health of the organizers as well as the voters. There needs to be a strict health protocol which may make sure that the head of the region general election does not become an arena of mass Covid-19 infection.

**Materials and Method**

This paper uses the juridical-normative research method. The approach used in this research is the descriptive-qualitative approach. This means that this research describes how the regional general election will be during the pandemic, where the organizers must fulfil a tight health protocol, so that a cluster health disaster during the election may be prevented.

**Results and Discussion**

The local-level participation of the people is a manifestation of desire and application of the people’s sovereignty principle which hopes for a real impact in creating an output, which is to create a new government. The effort to create a new government in the various regions of Indonesia actually manifests a spirit of nationalism and high hope. But the government and the Indonesian society have an awareness in reading the situation which is happening, where the Covid-19 pandemic is a main problem which must be wisely reacted upon. The relation between the society and the government may be said as a synergy to go through these hard times in the 2020 political contest. In this urgent condition due to the Covid-19 pandemic, all political maneuvers and mechanisms become riskier. The political actors must also have their own strategies to keep on directing the mass, because the aim is to win the competition.

Even if the choice of organizing the election of 2020 becomes optional, the consideration of the legal processes and results must be able to be described in a technique which is easily understood by all parties. This is because the loss experienced by the participants and the voters due to an uncommon technique may cause a long-term problem. Moreover, a great legal consequence may haunt the general election organizers.

Because of that, by issuing the Governmental Regulation in Change of the Constitution No. 2 of 2020, the government is thought to have created an amazing policy. It may be said as too brave. This is because this statement of optimistic law will be written in history. This Governmental Regulation in Change of the Constitution on the Regional General Election also places itself as a legal innovation. This Governmental Regulation is created due to the extreme condition which happens; thus, the head of the region general election must still run in the middle of the pandemic.

One on hand, in the political point of view, the execution of the 2020 general election is a water spring in the dry season of the pandemic’s era of uncertainty. The general election organization (KPU) answers all political efforts of the head of the region candidates. Because of that the prospecting election participants may decrease the excessive expenditures during the pandemic. On the other hand, there is the potential of a lawsuit on the organization technique, which may enter the arena of law enforcement. It is complicated and confusing and also the law during the pandemic is extraordinary law if the government want the regional election not became a disaster.

The organizers must be able to execute the election. It is no secret that the funding money becomes the main problem in organizing an election. If the fund is not enough due to economic policies in handling the Covid-19, there is a risk of a cut of funds for the election, which may decrease the performance quality. The choice to still organize the regional general election must be supported by giving a special budget without decreasing it for any reason.

To develop a discipline in running the health protocol during the regional general elections, it is crucial to strengthen the regulations in the forms of prohibitions and sanctions to the violation of those protocols. Unfortunately, this simultaneous regional general election still uses the regulatory design which
is only applicable during normal conditions. It cannot be applied during an abnormal condition due to the pandemic. Because of that, the prohibitions and sanctions to the violation of the health protocols are not regulated in the regional general election regulations. Meanwhile in Indonesia, we have not yet had enough experiences in organizing an electoral process during an urgent situation.

The point is that the regional KPU during the Covid-19 pandemic should not threaten the life of the citizens. Thus, the management of this simultaneous regional general election must be directed to fulfill the standard protocol in saving the human lives. Because principally, the regional general election is for the sake of the human beings, and not the other way around.

Practically, the KPU has noted 243 alleged cases of health protocol violation during the registration process of head of the region prospective pair of candidates which happened for three days. During the registration process, the prospective pairs of candidates were escorted by masses of supporters which causes the occurrence of crowds and has the potential to spread the coronavirus disease. Before that, President Joko Widodo has asked the Minister of Internal Affairs and the KPU to strictly monitor and act upon the parties who violate the health protocol during the regional democratic celebration to prevent the spread of the coronavirus disease and to prevent the occurrence of regional general election clusters.

Based on the data of the Ministry of Internal Affairs, there were 733 prospective pairs of candidates whose registration applications were accepted. Among them, 294 prospective pairs of candidates were incumbent. Based on the data from the Ministry of Coordinator in the Politic, Law, and Human Rights, Mahfud MD, until Wednesday afternoon (September 9th, 2020), there were 59 prospective pairs of candidates from that number who were confirmed to be positive of the Covid-19 disease, which were spread in 21 provinces. The General Election Commission stated that, even though they were tested positive of the Covid-19 disease, those prospective pairs of regional head candidates will not lose their position as candidates.

The KPU is optimistic that the election will be organized well if four main requirements are met. First, the legal certainty framework must be strengthened before starting the stages. As known before, the Governmental Regulation in Change of the Constitution No. 2 of 2020, the General Election Commission Regulation No. 5 of 2020 on the Stages, Schedules, Programs, and the Decree of the KPU the regional general election execution during the Covid-19 pandemic has been officially released.

The problem which arises is the threat towards the people’s safety and health if the 2020 Regional General Election will still be organized. This will risk the people as the constituents, the participants who are the pairs of candidates and the regional general election organizers who are the KPU and its team. Not only that, the quality degradation of the election organization stages which will be carried out during the Covid-19 pandemic may cause malpractices in its establishment process, starting from the voter data update, the independent candidate requirement of support verifications, campaigns, and the voting process.

The current problems which arrive due to the Covid-19 become universal and basic problems. On the other hand, the government and the related institutions persist to start the 2020 Regional General Election contest on December 9th. So far, Indonesia has not experienced a period of regional general election execution with the threat of a pandemic which has the high potential in influencing the health of the people and which may even cause death. The General Election organizers, especially the KPU must maximally apply the health protocols. They must also prepare adequate supporting equipment to be used in the field, such as personal protective equipment, hand sanitizers, disinfectant sprays, masks, soap, sinks to wash hands, sterilized voting booths, etc. The Regional Governments must increase their awareness towards the symptoms and the spread of the Covid-19 disease in their areas by preparing health facilities and health worker to handle unwanted occurrences.

**Conclusion**

Even though it attracts many critics, the Regional General Election has been determined to be established on December 9th, 2020. This means that this event which is held every five years will be organized during the Covid-19 pandemic. The initial stage of the Regional General Election process has produced more than 200 violations of health protocol, which causes a fatal impact, as 59 person of head of the region candidates were diagnosed as Covid-19 positive.
The General Election Commission and the government must act strictly to every violation of the health protocol, as it endangers many people. There must be clear regulations on the prohibition of the general election campaign and activities which involve many people in the red areas, and campaign limitations in the green areas. The government must increase the budget to prepare health protocol facilities such as personal protective equipment, hand sanitizers, disinfectant sprays, masks, soap, sinks to wash hands, sterilized voting booths, and other hygienic equipment to protect the public and the regional general election officials from the Covid-19.

**Conflict of Interest:** No

**Source of Funding:** Author

**Ethical Clearance:** Yes

**References**


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Characterization and Outcome of Patients Presented with Unilateral Nasal Disease to ENT unit at Hillah, Iraq

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Abstract

Background: A common finding during daily otolaryngological practice is a patient with unilateral nasal symptoms, nasal polyp or mass. The causes behind most cases of unilateral nasal disorder are inflammatory in nature and responds well to medical intervention and rarely there is need for surgical management. The possibility of neoplastic nature is high when there is unilateral nasal complaint or pathology as neoplastic conditions during their early stages may mimic inflammatory pathologies.

Aim of the Study: The aim of the current study was to highlight the causes of unilateral nasal disease, their most frequent mode of presentation, management strategies and outcome in a sample of Iraqi patients.

Patients and Method: The current prospective study included 96 patients, 42 males and 54 females, with signs and symptoms suggestive of unilateral nasal disease. The study was carried out at Hillah General Teaching Hospital, Babel province, mid-Euphrates region of Iraq and the work with this study has extended from January 2014 to August 2019. All enrolled patients were subjected to routine ENT examination and office flexible endoscopy. Patients were managed by functional endoscopic sinus surgery for purpose of excisional or incisional biopsy.

Results: The current study included 96 patients with a mean age of 49.09± 7.43 years and an age range of 39 to 67 years. There were 42 males and 54 females. The results of complete evaluation have shown the following pathologies at the end of the study: nasal polyposis (31, 32.3%), chronic rhinosinusitis without polyp (16, 16.7%), antrochoanal polyp (14, 14.6%), inverted papilloma (11, 11.5%), frontoethmoidal mucocele (7, 7.3%), concha bullosa (4, 4.2%), squamous cell carcinoma (3, 3.1%), rhinolith (2, 2.1%), fibrous dysplasia (2, 2.1%), adenocarcinoma (2, 2.1%), malignant melanoma (1, 1.0%), cavernous hemangioma (1, 1.0%), pyocele in concha bullosa (1, 1.0%) and non Hodgkin’s (1, 1.0%). Therefore, in the current study, nasal polyposis was the commonest cause of unilateral sinonasal disease followed by chronic rhinosinusitis without polyp, antrochoanal polyp and inverted papilloma. The rate of malignant neoplasms was low.

Conclusion: Differentiating the neoplastic nature form non-neoplastic nature of unilateral nasal pathology is the most critical management step and in the current study, nasal polyposis was the commonest cause of unilateral sinonasal disease followed by chronic rhinosinusitis without polyp, antrochoanal polyp and inverted papilloma. The rate of neoplastic malignant conditions was low.

Keywords: Unilateral nasal polyp, Hillah, Iraq.

Introduction

A common finding during daily otolaryngological practice is a patient with unilateral nasal symptoms, nasal polyp or mass. The causes behind most cases of unilateral nasal disorder are inflammatory in nature and responds well to medical intervention and rarely there
The possibility of neoplastic nature is high when there is unilateral nasal complaint or pathology as neoplastic conditions during their early stages may mimic inflammatory pathologies. Actually, the mission of an otolaryngologist is to discover neoplastic conditions in association with unilateral nasal complaint in order to offer the best management options that can assure cure with high rate. Despite the fact that unilateral nasal complaint is a frequent finding in daily clinical practice, literature dealing with the characterization and outcome of these conditions is relatively scanty.

Unilateral nasal discharge, nasal congestion and nose bleeding in addition to dysosmia, migraine, and facial swelling are most common presenting clinical complaints in patients with unilateral nasal disease. Clinical characterization of a patient complaining of single-sided nasal symptoms mass is an essential challenging health issue because they are often accompanied by multifactorial underlying etiology. Evaluation of such health issue should include good history taking, thorough local examination and endoscopic investigation in addition to radiologic evaluation. Findings on imaging play a significant role in the diagnosis and workup of sinonasal pathology. Bilateral versus unilateral involvement is a key feature that can differentiate between different etiologies.

The poverty of national and international publications dealing with clinical presentation and pathologic characterization of unilateral nasal complaint justified the planning and conductance of the current study in Hillah General Teaching Hospital, mid-Euphrates region of Iraq.

Patients and Method

The current prospective study included 96 patients, 42 males and 54 females, with signs and symptoms suggestive of unilateral nasal disease. The study was carried out at Hillah General Teaching Hospital, Babel province, mid-Euphrates region of Iraq and the work with this study has extended from January 2014 to August 2019. All enrolled patients were subjected to routine ENT examination and office flexible endoscopy. Patients were managed by functional endoscopic sinus surgery for purpose of excisional or incisional biopsy.

The ethical approval was issued by the ethical approval committee of the local health institute and a verbal consent was obtained from all participants following full illustration of the aim and the procedure of the study. The principal outcomes were the clinical presenting features and the type of pathology.

Data were transformed into SPSS (statistical package for social sciences) software (IBM, Chicago, USA, version 23) for purpose of statistical description. Categorical variables were expressed as number and percentage, whereas, quantitative data were expressed as range, mean and standard deviation.

Results

The current study included 96 patients with a mean age of 49.09± 7.43 years and an age range of 30 to 67 years. There were 42 males and 54 females. The results of complete evaluation have shown the following pathologies at the end of the study: nasal polyposis (31, 32.3%), chronic rhinosinusitis without polyp (16, 16.7%), antrochoanal polyp (14, 14.6%), inverted papilloma (11, 11.5%), frontoethmoidal mucocele (7, 7.3%), concha bullosa (4, 4.2%), squamous cell carcinoma (3, 3.1%), rhinolith (2, 2.1%), fibrous dysplasia (2, 2.1%), adenocarcinoma (2, 2.1%), malignant melanoma (1, 1.0%), cavernous hemangioma (1, 1.0%), pyocele in concha bullosa (1, 1.0%) and non Hodgkin’s (1, 1.0%). Therefore, in the current study, nasal polyposis was the commonest cause of unilateral sinonasal disease followed by chronic rhinosinusitis without polyp, antrochoanal polyp and inverted papilloma. The rate of malignant neoplasms was low, as demonstrated in figure 1.

The presenting clinical features are shown in figure 2. The most frequent clinical symptom was nasal obstruction which was seen in 81 cases (84.4%), followed by rhinorrhea (69 cases, 71.9%), then postnasal drip (33 cases, 34.4%) and anosmia (23 cases, 24.0%). Other manifestations included: epistaxis, facial pain, otologic symptom, visual problem and toothache in 8 (8.3%), 8 (8.3%), 4(4.2%), 3(3.1%) and 3(3.1%), respectively.

The radiological findings of some patients have been demonstrated in figures 3 through 5.
Figure 1: Bar chart showing the frequency distribution of patients with unilateral nasal disease according to etiology.

Figure 2: Bar chart showing the frequency distribution of patients with unilateral nasal disease according to clinical features.
Figure 3: Computed tomogram findings in a patient with unilateral chronic rhinosinusitis

Figure 4: Computed tomogram findings in a patient with unilateral nasal polyposis
Figure 5: Axial view patient with unilateral nasal disease

Figure 6: Computed tomogram findings in a patient with antrochoanal polyp
Discussion

One of the frequent presenting features of patients visiting ENT units is the complaint of unilateral nasal problems. Indeed, it is a challenging presentation to the ENT specialist because of the high possibility of a neoplastic disorder to be seen in association with unilateral nasal presentation than with bilateral nasal presentation; however, overall, the proportion of neoplastic disorders is low in either presentation 11,12.

In the current study, which has extended for more than 3 years, we were able to categorize 96 patients with unilateral nasal disease. The most frequent pathologies were nasal polyposis, chronic rhinosinusitis without polyp, antrochoanal polyp and inverted papilloma. In order to accomplish this mission, we followed the rule of comprehensive clinical evaluations of patient’s age, presenting clinical features, examination using nasoendoscopy, and radiological investigations, computed tomography (CT) in particular. In accordance with current study findings, it has been stated that the majority of pathologies in the sinonasal region are reactive inflammatory disorders and that the minority of them are neoplastic disorders 12.

The problem with neoplastic malignant sinonasal pathologies is that they mimic inflammatory disorders in their early stages, so that the diagnosis of these disorders is often made late. Delay in the diagnosis of such malignant disorders is usually accompanied by poor prognosis; therefore, meticulous evaluation of unilateral nasal presentations is of prime importance to exclude malignant neoplastic disorders 1.

With respect to age, benign neoplasms are often seen in children and young adults (1). The average age at time of detecting unilateral choanal polyps is around 27 (13). Fifth to 7th decade is the usual time for detecting neoplastic disorders in patients with sinonasal disorder with a male predominance and low socioeconomic status 14. Indeed, one of principal observations in the current study was that males were more often affected by neoplastic disorders than women and that inflammatory conditions were mainly seen in younger patients.

A variety of clinical manifestations are associated with unilateral nasal lesions, such as nasal discharge, nasal obstruction, anosmia, headache and epistaxis. In the current study the major presenting symptoms in order of frequency were nasal obstruction which was seen in 81 cases (84.4%), followed by rhinorrhea (69 cases, 71.9%), then postnasal drip (33 cases, 34.4%) and anosmia (23 cases, 24.0%). These findings are approximately the same as the findings of previous authors 1.

Facial pain, dental complaint and visual and otologic manifestation have also been seen in our study in accordance with previous observations made by several authors 14.

Comprehensive understanding of intranasal structure and characterization of intranasal pathologies have been made easy and amenable following the introduction of nasal endoscope 1. Therefore, in the current study, the use of nasal endoscope provided both diagnostic and therapeutic tool since a number of conditions were treated by total excision of nasal pathology. The nasal mass lesions may be seen as single of multiple masses, sessile or pedunculated polyps.

Inflammatory conditions like acute and chronic CRS, either from bacterial or fungal origin were the commonest histopathological diagnosis in our study. Inflammation was the commonest form of nasal pathology in the current study and this is in accordance with previous reports 1. In our study, the commonest benign neoplasm was inverted papilloma (11.5%) and this finding is supported by previous similar findings 1,15. On the other hand, the most common malignant neoplasm in our study was squamous cell carcinoma which is the same observation as the observation of some previous authors 1,16. In our study, a single case of Non-Hodgkin lymphoma was identified. Previous studies have also documented the rarity of Non-Hodgkin lymphoma in this clinical setting 1,17.

Conclusion

Differentiating the neoplastic nature form non-neoplastic nature of unilateral nasal pathology is the most critical management step and in the current study, nasal polyposis was the commonest cause of unilateral sinonasal disease followed by chronic rhinosinusitis without polyp, antrochoanal polyp and inverted papilloma. The rate of neoplastic malignant conditions was low.

Acknowledgement: We would like to express our deep thanks to all patients who participated in the current study to be a baseline report about the anatomical and the pathological presentation of unilateral sinonasal disease in Iraq.
Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Surgery and all experiments were carried out in accordance with approved guidelines.

References


The Effect of Special Exercises to Develop Some Physical and Skill Capabilities Using Basketball Auxiliary Materials (3 vs 3) for Youth Players

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Abstract
For weight lifting exercises, these exercises work to develop (the explosive strength of the arms) and (the force characterized by speed, and the bearing strength of the two legs) as well as developing the skill of shooting by jumping with two point and through the researcher’s follow-up to the matches, he found that many young players lose a lot of physical and skill capabilities with the passage of time, especially in the last minutes of the game. Due to the lack of interest in some requirements of the training process, including (the explosive strength of the arms) and (the force distinguished by the speed and the bearing strength of the two legs) in addition to the skill capabilities chosen in the research as well as the small number of training units, which leads to inconsistency with the requirements and training of physical and skill performance and the type of muscular work to perform. Hence, the research problem crystallized, as the researcher decided to study this topic and prepare special exercises to develop some physical and skill capabilities using auxiliary tools to develop and their impact on the performance of two-point hopping by basketball players for (3 vs 3) for youth.

Keywords: Special Exercises, Physical, Skill Capabilities, Basketball.

Introduction
Sports training based on scientific principles is one of the most important factors that enable us to reach the highest level of sports that can be reached, and special exercises are one of the method of sports training that aims to raise the efficiency of players in terms of physical and skill, and from here comes the role of auxiliary tools that have The biggest impact and the basis in training various sports, including the basketball game for (3 vs 3), as we note that the various sports departments and coaches around the world are looking for everything new in order to contribute to developing the level of performance of players and improve their results, which affects and positively in the development of capabilities Players physically and skillfully. The basketball game for (3 vs 3) is one of the games that were recently developed and started to spread in various countries, including our dear country, Iraq. This game has many characteristics that differ from the usual basketball, as it is practiced in half of a stadium measuring (11 m × 15 m) With a time of (10) minutes for the match, the team that scores (21) points ends the match in its favor even if it is before the specified time, and the attack time will be (12) seconds, and this requires a special physical preparation to help the players to continue with physical and skill performance and at the same level.

Among the most important physical abilities in the basketball game for (3 vs 3) are (the explosive strength of the arms) and (the force characterized by speed, and the bearing of force for the two men) As for the skill that is more important is aiming to jump with two points, that training the physical abilities of the basketball game for (3 vs 3) in ages (under 18 years) for young players is one of the essential things in order to build a training base to supplement the national teams, as it represents a stage of preparation in advance for clubs and teams players, using tools and scientific method to achieve better results for them in the future. Hence the importance lies in preparing special exercises to develop skillful physical abilities by using the auxiliary tools, as
these tools have become used by the world as an integral component of weight training and these exercises work to develop (the explosive strength of the arms) and (the force characterized by speed, and the bearing of force for the two men) as well as the development of Shooting skill by jumping with two points⁴.

**Sample homogeneity and sample equivalence:**

**Sample Homogeneity:** The researcher conducted the homogeneity of the sample members, and the researcher used the coefficient of variation and conducted the homogeneity in each of the length, weight, age, training age, and table (1) shows that.

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**Table (1). Shows the equivalence of the control and experimental groups in the sample measurements and the research variables.**

<table>
<thead>
<tr>
<th>No.</th>
<th>Variables</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>The calculate value of (T)</th>
<th>The scheduled value of (T)</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Explosive power For arms</td>
<td>Watt</td>
<td>4.47</td>
<td>0.30</td>
<td>4.48</td>
<td>0.31</td>
<td>1.374</td>
<td>Not significant</td>
</tr>
<tr>
<td>2</td>
<td>Distinguished strength Fast For the two legs</td>
<td>S</td>
<td>9.97</td>
<td>0.611</td>
<td>9.85</td>
<td>0.680</td>
<td>0.514</td>
<td>Not significant</td>
</tr>
<tr>
<td>3</td>
<td>Stamina</td>
<td>No.</td>
<td>35.9</td>
<td>5.44</td>
<td>30.2</td>
<td>7.42</td>
<td>1.95</td>
<td>Not significant</td>
</tr>
<tr>
<td>4</td>
<td>Aiming from the he front by jumping</td>
<td>Point</td>
<td>14.5</td>
<td>1.354</td>
<td>15.2</td>
<td>1.398</td>
<td>1.197</td>
<td>Not significant</td>
</tr>
</tbody>
</table>

**Method**

1. Arab and foreign sources.
2. World Wide Web (Internet).
3. Observation and experimentation.
4. Personal interviews.
5. The assistant team.

**Devices and auxiliary tools used in the research:**

- A device for measuring weight (country of origin, China), count (1).
- A laptop computer (hp - pavilion g6/elite book) (country of origin, America), count (1).
- Canon type digital camera (country of origin, Japan), count (2).
- Stopwatch type (Omega) and (Han Hart) (country of origin, China) count. (2).
- Legal Basket Balls (Molten) Number (10).
- A medical ball weighing 3 kg, count (1).
- Whistle (molten), count (2).
- Chairs, number (4).
- Leather tape measure length (20 m), count (1)
- 4 colored adhesive tape.
- Signs of (10) height (30) cm
- Cones of different heights, number (10).
- Recording papers and pens.
- Half a legal basketball court.
- Ground stairs (1).
- Lean handles.
- Different tensile elastic cords (country of origin Germany - manufacturer/acreative).
- Jumping ropes (country of origin Germany - manufacturer/acreative) count (4).

**Determining the physical and skill capabilities of basketball for (3 vs 3) and its tests:** After reviewing the available scientific sources that are appropriate to the subject of the study and through conducting personal interviews with trainers with expertise and specialization, as well as the researcher relying on his personal experience, physical and skill capabilities were identified where physical capabilities were chosen and
they are both (the explosive capacity of the arms and the strength marked by speed And bear the strength for the two men) As for the skillful abilities, the skill of shooting was chosen by jumping by two points and peaceful aiming.

Determining the tests for basketball’s physical aptitude for (3 vs 3): The test is (a set of exercises given to the individual with the aim of identifying his abilities and aptitudes or qualifications, by examining the researcher on a set of scientific sources as well as conducting personal interviews with coaches and those with experience and specialization in the field of sports training as well as benefiting from the researcher’s modest experience as a player in the league Excellent Iraqi basketball as well as his participation in (3 vs 3) tournaments held by the Iraqi Central Basketball Federation in previous years, a group of physical and skill tests were chosen that are appropriate to the nature of the research.

Describing physical and skills tests:

Describing physical ability tests:

**First : Arms explosive power test:** Throwing a medical ball weighing (3) kg with two hands from a sitting position on the chair.

**The purpose of the test:** To measure the explosive power of the arms of the arms.

**Instruments used:** A medical ball weighing (3) kg, a tape measure and a chair with a secured torso strap.

**Method of performance:** The laboratory sits on the chair and the medical ball is held in hands with hands so that the ball is higher and behind the head.

**Conditions:** The laboratory is granted three consecutive attempts, and the laboratory must be allowed to perform a number of throws for the purpose of warming up before performance. When the laboratory moves during the performance of one of the attempts on the chair, the result is not counted and another attempt is given instead.

**Recording:** The distance between the front edge of the chair and the nearest point the ball places on the ground is calculated. The result of the best attempt is calculated from the three attempts.

**Second: Strength test for the two legs speed:**

**Name of the test:** The forward jump test for the two legs during (10 seconds).

**The purpose of the test:** To measure the characteristic velocity of the muscles of the legs.

**Tools:** Flat space floor space, tape measure, stopwatch, whistle, chalk or marker

**Method of performance:** The laboratory stands on the starting line and when you hear the start beep and start the operation of the stopwatch, the laboratory launches with the maximum speed forward in front of the two legs from the moment of the first whistle until the timing reaches (10 seconds) and the distance traveled by the player during the test time is calculated.

**Recording:** The distance traveled is measured in meters and its parts during time (10 seconds).

**Third: strength tolerance test:**

**Test name:** Endure the strength of the two legs.

**The purpose of the test:** To measure the strength of the two men.

**Tools:** Flat ground or legal basketball court, person with height (30) cm.

**How to play:** Upon hearing the beep, the player starts jumping from the stake of the two sides (right and left) for a period of (30) seconds.

**Recording method:** Calculates the maximum number of jumps for a player within (30) seconds.

**Exploratory Experience:** The exploratory experience is a practical training for the researcher to determine the negatives and positives that the researcher meets during the test to avoid them, and this is why the researcher conducted his exploratory experience on a sample of (8) players from the young players of Al-Furat Sports Club in basketball and with the help of the team after explaining the tests For them and how to register, the experiment was carried out on (1/8/2019) on (Thursday), at exactly (4/PM) and continued for one day divided between physical and skill tests, so it was:

1. Knowing the difficulties and problems that the researcher faces during taking the tests.
2. Knowing the time taken for each user test.
3. Ensure that the auxiliary team understands the vocabulary and how efficient it is in applying it.
4. Find the scientific conditions and transactions for the tests (validity, reliability, objectivity).
5. The appropriateness of the tools and devices used in the test.
6. Knowing the difficulties and problems facing the researcher during the application of special exercises.
7. Knowing the time taken to perform exercises.

The scientific foundations of the test: The researcher has taken into account the scientific conditions that must be met for the selected tests within the study, and mentions QaisNaji and Bastawisi Ahmed (1987) (The most important characteristics of a good test, as well as measurement, are the test of validity, reliability, and objectivity factors for that test or measurement).

Honesty: There are several methods for measuring the honesty of the tests, including (apparent honesty). The apparent honesty means that “the test appears to be true in its apparent form because its name relates to the function to be measured. The apparent honesty can be relied upon in the validity of the test and its sincerity, which is the method the researcher used to find the truthfulness of the tests.

Stability: “The concept of persistence is the degree of confidence, i.e. the result of the test with a constant value during repetition or repetition, i.e. the meaning of persistence of the results obtained by the researcher if the experiment was repeated on the same group. A week has passed since physical tests were repeated on 7/8/2019 on Wednesday, and the researcher used the Law of Correlation Coefficient (Pearson), to extract the coefficient of persistence, and physical and skill tests had a high degree of stability.

Objectivity: The method for calculating the scores in the tests used in the research was determined by time or number and is objective in itself.

Research Procedures: The researcher has determined all the requirements of the main experiment through identifying physical and skill tests using the auxiliary tools, and after conducting the exploratory experiment and benefiting from them in organizing work and preparing for the main experiment, the researcher has conducted a pre-training unit for the individuals of the main experiment sample in order to familiarize the sample members with the nature of the exercises To be trained on.

Pre-test: After providing all the necessary conditions and requirements for the tests, the researcher conducted the tribal tests on (8/8/2019) on Thursday, where the researcher conducted the tests for physical and skill capabilities.

2-11 Exercises:

First-Goals: The researcher prepared exercises aimed at developing (the explosive ability of the arms) and (the force characterized by speed and endurance of strength) for the two men. The exercises also aimed at developing both skills of two-point jumping and peaceful shooting, using the auxiliary tools, for young players in basketball.

Second- Standards:

Test the content of the proposed training curriculum

A- To contribute to achieving the goals of the special preparation stage (physical and skill) for young players (Al-Nassiriya Sports Club in basketball).

B- The contents of the curriculum should be consistent with the physical and skill characteristics of the players.

C - The curriculum was applied by extracting the average tension of all exercises used in the curriculum.

D - to take into account what means and capabilities affect when implementing.

E - Diversity in the contents of the curriculum and flexibility in implementation, which makes the effect of the curriculum clear on implementation.

F- The auxiliary tools used in the research should fit the capabilities of young players to use and interact with these tools.

Third - Training Method: The researcher used the exercises with the method of high intensity young training.

Dimensional tests: After completing the application of the exercises used in the research to the main research sample, the post-tests were conducted on the experimental and control group, taking into account
"in all the circumstances, the method of implementation and the tools used, since the post-tests were done on (9/10/2019) on (Wednesday) the researcher by conducting physical and skill tests.

Statistical Means: The researcher used the necessary statistical means to treat the results in a way that serves the research goals and relying on the SPSS-24 statistical bag, which is:

1. Arithmetic mean
2. Standard deviation.
3. Percentage.
4. (T) for the specimen samples.
5. Persson coefficient of stability.

Circles and standard deviations and value (T) calculated and the significance level and type of significance of the physical capacities and skill shooting by jumping two points in the tribal and posttests of the experimental group, reaching the arithmetic mean of the ability of the explosive armrests in the pre-test (5.51) and standard deviation (In the post test, the mean was (6.16) and the standard deviation was (1.21). The calculated value of (T) was (2.301) and the significance level was (0.05). As for the type of significance, it was (moral). The tribal (18.28) and the standard deviation (6.37), and in the post-test the mean (31.05) and the standard deviation (2.41), while the calculated value of (T) was (3.421). As for the level of significance it reached (0.05) and the type of significance (moral), and the mean of bearing the strength of the two legsin the test (3.62) and the standard deviation (3.50), and in the post-test the mean (53.25) and the standard deviation (3.425) and the level of significance (0.05). The type of significance is (moral). The standard (1.29), the calculated value of (T) was (2.678), and the significance level was (0.05) and the type of significance (moral).

The researcher attributes the positive results to the control group as a result of the coach’s curriculum and their commitment to applying it during the daily training units and the results of physical and skill tests have shown that they have evolved and this confirms the correlation between physical capabilities and basic offensive skills in basketball. “The physical factor must include the strength of the player who helps him to Shooting with strength, agility and flexibility is the player who can take the right position when shooting. Through the foregoing, the researcher sees that the development of basic offensive skills in basketball comes as a result of the practice of regular and planned training correctly, which affected the physical capabilities of the research sample and consequently affected the basic offensive skills that developed well after the application of exercises and that had an effective impact in increasing The accuracy of performing basic offensive skills in basketball, and this is what (Mohammed Hassan Allawi, 1994) indicated that “physical preparation of strength, endurance and speed is considered the main pillar for raising the tactical level of players. The researcher agrees with (Qasim Hassan Hussein) that the training process is “the continuous organized process that gains the individual knowledge, skill, ability, ideas or opinions necessary to perform a specific work or achieve a specific goal as well as achieving organizational goals and adapting to work and what is offered to the individual from certain information, skills, or mental attitudes are necessary in the organizational viewpoint to achieve the organization’s goals”.

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Conclusions

According to the research results, the researcher reached the following conclusions: The exercises prepared by the researcher have a positive and effective impact in developing physical abilities and two-point shooting skill by jumping in basketball for youth. As a result of the development of physical abilities, this was the reason for developing the skill of shooting with two points by jumping in basketball for youth.

1. The researcher recommends the use of exercises prepared by the researcher because of its positive impact on changing and developing some physical variables and the skill of aiming with two points in basketball.

2. The researcher recommends adopting the exercises that he prepared in the research to develop the physical capabilities that were chosen in the research.

3. Encouraging trainers to prepare special exercises to develop physical and skill capabilities.

4. Conducting research and studies on the numbers of special exercises for the category of applicants in the basketball game.

5. Carrying out similar studies and other sports activities.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the General Directorate of DhiQar Education and all experiments were carried out in accordance with approved guidelines.

References


Comparative Study of Small Dose Bupivacaine-fentanyl vs. Normal Dose of Bupivacaine in Spinal Anaesthesia for Patient Above 60 Years Old Undergoing Surgery

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1FICMSA, Anaesthesiologist, Fellow of Iraqi Council of Medical Speciality, Aldewaniya Teaching Hospital, Iraq

Abstract

The purpose of the study was to compare small dose bupivacaine - fentanyl and normal dose of bupivacaine in spinal anaesthesia for patient above 60 years old undergoing femoral and tibial surgery. 80 elderly patients of either sex belonging to ASA I, II & III undergoing elective orthopedic lower limb surgeries under spinal anaesthesia were studied in this prospective, randomized double blinded study. First group A (n=40) was given inj. Bupivacaine hyperbaric 3 ml (15mg) & group B (n=40) was given inj. Bupivacaine (2 cc) + 25 mcg fentanyl. Parameters like time for adequate level of analgesia (T9), peak sensory level reached, beginning of motor block to recede to L3-L4 level (modified bromage scale), how long sensory block continue and number of complications are noted in both groups result: The time of adequate level of sensory block to be started (T9) was longer for group B than group A. How long of sensory block to be started was slightly more for group A. The time of motor block continue to work was more in A than group B. It is concluded that subarachnoid block with 2cc bupivacaine 0.5%H and 25mcgfentanyl is a more safer and better option for patient above 60 years of age undergoing femoral and tibial surgeries.

Keywords: Spinal anaesthesia, patient, bupivacaine-fentanyl, bupivacaine.

Introduction

Universally agreed that best type of anaesthesia for fracture fixation of tibia and femur surgery is subarachnoid block producing less post operative loss of memory and hallucination than general anaesthesia. However spinal block has got its own inherent complications, especially related to cardiovascular stability. Perioperative hypotension may affect postoperative recovery and also the large number of coronary disease, put patient at risk of ischemia secondary to hypotension. Vasopressor and IV fluids are used to treat or prevent hypotension. Another technique is by using very low titrated dose of local anaesthetic but it may not provide acceptable time for sufficient anaesthesia and better time for surgery. Studies have established that fentanyl and Marcaine anaesthetics administered together intrathecally have very strong synergistic analgesic effect, enhancing spinal blockade without affect the degree of sympathetic blockade ensuring better hemodynamic stability. The purpose of this study was to COMPARE hemodynamic and sensory effect of small dose bupivacaine - fentanyl in regional anaesthesia versus ordinary dose of bupivacaine in patients undergoing surgical correction of lower limb tibial and femoral.

Materials and Method

After approval of institutional ethical committee and informed consent of ASA I, II & III with age > 50 years of both sexes undergoing elective lower limb orthopedic surgeries were included in this double blind randomized trial. Patients with history of allergy to local anaesthetics, severe cardiac or respiratory diseases and uncontrolled hypertension were excluded. After routine and special investigations (if required) are done, patients were randomly allocated to group A (Bupivacaine-15mg,3ml) & group B (Bupivacaine-10mg, 2ml + 25 mcg [1ml] fentanyl). Demographic data were comparable in age, height and duration of surgery (Table-1). Patients were fasted 8-10 hours and in operation theatre preloading with 8 ml/kg Ringer lactate done and standard monitors applied. From previous studies, low dose of bupivacaine and fentanyl was...
identified. Those studies are as below. Diana Fernander 2., Monterrat Rue et al (1996) 12.5 mg1. Plus saline or 25 mcg fentanyl. Ben David, frankel et al (2000) 4mg bupivaacaine plus 3.20 Mcg fentanyl4. Atallah et al (2006) .Under full sterilized and antiseptic precautions lumbar spinal Block was done in sitting position in L3-L4 space by 22 Quincke needle both group were given respective drugs and sensory level of T6- T8 was achieved . patients were given oxygen by ventimask of 4 L/MINUTES .pulse rate, blood pressure, spo2 were measured every 5 minutes for first 20 minutes and then every 10 minutes for next 1 hour and then every hour for the next 24 hours postoperatively hypotension was defined as SBP ≤ 90 or mean arterial BP30% lower than baseline decline of greater than 30% from normal mean arterial pres sure which must treated with an incremental IV bolus of phenylephrine 50 Mic, Bradycardia defined as Heart Rate below 60 BPM must treated with IV Atropine other parameter like time for adequate level of analgesia peak sensory level reached, Time for Motor block to recede To L3-L4 level, duration of sensory block(Table-2) and incidence of complications likeNausea, vomiting, pruritus, sedation, shivering were assessed and compared .Motor block was assessed using modified Bromage scale 0 no paresis – full movement of lower limb

1-- Partial paresis – flex knees and ankles

2-- Partial paresis – flex ankles .

3-- Full paresis – no movement

Sedation status was assessed using

0 –Awake and alert

1-- Respond to voice

2-- Respond to painful stimuli

3-- No response

Results

The study was done in double blinded, prospective randomized manner in 80 patients in al diwaniya teaching hospital and al furat private hospital scheduled to undergo elective orthopedic lower limb surgeries under spinal anaesthesia . the demographic data (age, weight , sex, and ASA grading) were comparable and statically non significant (table 1) ALL surgeries was lasted from 110 to 180 minutes equal distribution of mens and womens in both groups was done and most of them were ASA II – III students T-test was used f0r statistical Analysis .

- The BEGINNING of adequate level of sensory block (T9) was little late for group B (128 +/- 8 sec) than A (95 +/- 10 sec) and was statically significant (table 2)
- HOW long motor block was continued in group A1 (162 +/- 7 min) comparing to B2 (129 +/- 9) and was statistically significant.
- Lower pulse rate less drop in blood pressure was noted in group B2 than group A1, thus there is better haemodynamic stability in group B2
- Incidence of drop in BP and use of vas0press0rs WAS much larger in group A1 and was found to be statically significant
- Latency of sensory block was slightly more for group A1 but was not found to statically significant
- Boutes of bradycardia 0r pruritus was common in group B2.
- No one of the patients in both groups had regurgitation 0r vomiting 0r respiratory depression .
- Shivering was higher in group A
- RASS score was used to assess sedation intraoperative and postoperative. (rantigon agitated sedative score)

Discussion

Maintenance of body physiology as near normal as possible during anaesthesia is one of the primary goals of anaesthesiologist . Marked hemodynamic derangement are often seen following subarachnoid block especially in trauma and elderly patients. Neuraxial opoids are not associated with sympathetic nervous system denervation, muscle power weakness or loss of speech . they predominantly act at the MU receptor present in substantiagelatinosa of spinal cord to exert its synergistic effect more specifically for visceral pain. The recommended level of regional anaesthesia for lower limb surgery is T9 . standard recommended dose of 0.5% hyperbaric bupivacaine is 3cc (15 mg) In our present study, we have added 25 Mcg fentanyl, ahighly lipophilic opoid to lower doses of 0.5% bupivacaine hyperbaric and COMPARED hemodynamic parameters like blood pressure, heart rate changes, side effects of fentanyl and motor and sensory profiles of block.
In our study 16 patients of group A developed hypotension and needed vaspressors compared 4 patients of group B. These findings are in agreement with findings of Ben David et al (2000), Ben David, Frankel (2000), Matyr (2001). There were high increase in the beginning of adequate block in group B (128+/-/8.3 sec) as compared to group A (95+/-/10.3 sec). Addition of fentanyl reduces the pH of hyperbaric bupivacaine. This may be reason for delay in onset of adequate block (table 2). The total duration of sensory block for group A was 227.6 +/- 9.8 min while group B was 211.5 +/- 14.2 min. The difference between two groups was statically insignificant as per Boucher et al (2001) and Rajesh Mahayan V K Grover et al (2005) addition of fentanyl enhances duration of sensory block in which dose of Bupivacaine –H was same. But in our study dose of Bupivacaine in fentanyl group is much lower which can be the reason for slightly lower duration of sensory block.

MOTOR BLOCKED LAST LONGER in group A than group B and none of the patients required any supplementary anaesthetic interventions during surgery.

There was no incidence of sedation or respiratory depression in 2 groups. Fentanyl abolishes shivering by central mechanism in group B. Pruritus is most common side effect of intrathecal opioid in our study 4 among 40 in group B had pruritus which was treated by ondansetron. Nausea and regurgitation were not seen in any of these groups. Adjuvant drug like fentanyl reduces the pH of hyperbaric bupivacaine. It may be the reason for the delay in onset of adequate block.

### Table 1. Data were comparable in age, height and duration of surgery

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Group B</th>
<th>Group A</th>
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<tbody>
<tr>
<td>Age</td>
<td>68 +/- 7</td>
<td>65 +/- 6</td>
</tr>
<tr>
<td>Height</td>
<td>163 +/- 5.5</td>
<td>164 +/- 5.8</td>
</tr>
<tr>
<td>Duration of surgery (min)</td>
<td>128 +/- 32</td>
<td>135 +/- 30</td>
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<tr>
<td>Male : Female</td>
<td>25 : 15</td>
<td>25 : 15</td>
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<tr>
<td>ASA Grade II : III</td>
<td>24 : 16</td>
<td>25 : 15</td>
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</table>

### Table 2: Characteristics of spinal block.

<table>
<thead>
<tr>
<th>Time of onset of adequate block – T10 (sec)</th>
<th>Group B 127 +/- 7.3</th>
<th>Group A 96 +/- 10</th>
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<tbody>
<tr>
<td>Duration of motor block (min)</td>
<td>129 +/- 9</td>
<td>163 +/- 7</td>
</tr>
<tr>
<td>Duration of sensory block (min)</td>
<td>211.5 +/- 14.5</td>
<td>227.6 +/- 9</td>
</tr>
</tbody>
</table>

### Table 3. Complications: Group A and Group B

<table>
<thead>
<tr>
<th>Hypotension</th>
<th>Bradycardia</th>
<th>Pruritus</th>
<th>Sedation</th>
<th>Nausea and regurgitation</th>
<th>Tremors</th>
<th>Total spinal</th>
</tr>
</thead>
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<tr>
<td>4 (10%)</td>
<td>16 (40%)</td>
<td>0</td>
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<td>2.4 (6%)</td>
<td>1 (3%)</td>
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<tr>
<td>4 (10%)</td>
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</table>
Conclusion

From current study it was concluded that subarachnoid block with 2 cc bupivacaine 0.5% H and 25 Mcg fentanyl is more safer study, both in terms of maintaining hemodynamic stability and lower incidence of complications without compromising the surgical condition for patients undergoing femoral and tibial surgeries. B+F can be a safer alternative with conventional dose of bupivacaine, which can be reduced after adding Fentanyl in low dose bupivacaine, after completing this study, we will study for other doses.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Aldewaniya teaching hospital and all experiments were carried out in accordance with approved guidelines.

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Public International Law in the Situation of a Pandemic

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Abstract
In recent years, there have been considerable developments in international law with respect to the normative definition of the right to health, which includes both health care and healthy conditions. These norms offer a framework that shifts the analysis of issues such as disparities in treatment from questions of quality of care to matters of social justice. Building on work in social epidemiology, a rights paradigm explicitly links health with laws, policies, and practices that sustain a functional democracy and focuses on accountability.

Keywords: Public international, situation, pandemic.

Introduction
International health law, or what is now also called global health law, is a relatively new academic field. In its broadest definition, it includes all international legal regimes relevant to public health—international environmental law, international humanitarian and human rights law, international trade and labor law, international laws relating to arms control, and so on. Construed more narrowly, it incorporates only those international legal regimes specifically designed to address health threats. The two most notable examples are the International Health Regulations (focused on infectious diseases) and the World Health Organization’s Framework Convention on Tobacco Control (FCTC) (focused on chronic diseases). There is an important distinction between international health law and global health law. International health law connotes a more traditional approach derived from rules governing relations among nation-states. Global health law, on the other hand, is developing an international structure based on the world as a community, not just a collection of nation-states. This structure is inclusive of individuals and nongovernmental organizations, especially where health problems are seen as truly global. Globalization has heightened the need for worldwide public health cooperation. International health law developed originally in the mid-nineteenth century to control infectious diseases and has transformed over time to include multiple norms and standards and to become a significant component of foreign policy. Amidst these changes, however, a lack of normative theory has left the field without a basis for justice or common ground on the ethics and governance of threats to global health. Moreover, research to date has neglected normative problems, as well as the role of global health justice in addressing such problems, especially in establishing moral norms that guide the roles of international and domestic law as tools of public health.

WHO law for international regulation of international epidemics: A central and historic responsibility for the World Health Organization (WHO) has been the management of the global regime for the control of the international spread of disease. Under Articles 21(a) and 22, the Constitution of WHO confers upon the World Health Assembly the authority to adopt regulations “designed to prevent the international spread of disease” which, after adoption by the Health Assembly, enter into force for all WHO Member States that do not affirmatively opt out of them within a specified time period. In consideration of the growth in international travel and trade, and the emergence or re-emergence of international disease threats and other public health risks, the Forty-eighth World Health Assembly in 1995 called for a substantial revision of the Regulations adopted in 1969. In resolution WHA48.7, the Health Assembly requested the Director-General to take steps to prepare their revision, urging broad participation and cooperation in the process. After extensive preliminary work on the revision by WHO’s Secretariat in close consultation with WHO Member States, international organizations and other relevant partners, and the momentum created by the emergence...
of severe acute respiratory syndrome (the first global public health emergency of the 21st century), the Health Assembly established an Intergovernmental Working Group in 2003 open to all Member States to review and recommend a draft revision of the Regulations to the Health Assembly. The IHR (2005) were adopted by the Fifty-eighth World Health Assembly on 23 May 2005. They entered into force on 15 June 2007.

**International Health Regulations (IHR):** The International Health Regulations (IHR 1969), replaced by IHR 2005 had been adopted by the World Health Assembly on 23 May 2005 and came into force on 15 June 2007. IHR 2005 are a legally binding agreement among World Health Organization (WHO) member states and other states that have agreed to be bound by them. New revision was necessitated by concerns about increasing global health threats and the need to respond with more effective surveillance and control practices.

The limitations of IHR 1969, which led to their revision, related to their narrow scope, their dependence on official country notifications, and their lack of a formal internationally coordinated mechanism to contain international disease spread. The IHR 2005, which is firmly based on practical experiences, has broadened the scope of IHR 1969 to cover existing, new and re-emerging diseases, including emergencies caused by non-infectious disease agents.

The purpose and scope of the IHR (2005) are “to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade.” The IHR (2005) contain a range of innovations, including: (a) a scope not limited to any specific disease or manner of transmission, but covering “illness or medical condition, irrespective of origin or source, that presents or could present significant harm to humans”; (b) State Party obligations to develop certain minimum core public health capacities; (c) obligations on States Parties to notify WHO of events that may constitute a public health emergency of international concern according to defined criteria; (d) provisions authorizing WHO to take into consideration unofficial reports of public health events and to obtain verification from States Parties concerning such events; (e) procedures for the determination by the Director-General of a “public health emergency of international concern” and issuance of corresponding temporary recommendations, after taking into account the views of an Emergency Committee; (f) protection of the human rights of persons and travellers; and (g) the establishment of National IHR Focal Points and WHO IHR Contact Points for urgent communications between States Parties and WHO.

This approach has roots in Aristotle’s political theory and Amartya Sen’s capability approach, but it moves extensively beyond and considerably extends this work for national and global health purposes. From this perspective, health is intrinsically and instrumentally valuable; all individuals should have equal capability to be healthy. It takes the individual as the central moral unit of justice.

Under this approach, if we value, intrinsically and instrumentally, individuals’ capabilities to be healthy, we regard deprivations of health capabilities as inequalities in individuals’ capabilities to function. Decrements in a person’s health constitute direct threats to his or her well-being and agency. Health capabilities are therefore prerequisites to other capabilities, and their moral importance calls for a sense of urgency. From this perspective, a global society and its constituent nation-states must address global health inequalities and global threats to human health. Primary moral responsibility falls on nation-states, within which health inequalities and the sources of health threats lie.

Achieving global health equity requires global law and policy to strengthen the capacities and wills of domestic institutions, laws, and policies to address health issues within their countries; the future of global health law cannot be examined or understood as separate from domestic health law and policy. Global health law and policy also have key roles in the development and internalization of public moral norms to create and sustain health institutions, policies, and laws in the long term.

**Full compliance with international health regulations:** The International Health Regulations, the principle document governing the response to public health emergencies that pose an international threat, were revised in 2005 and became binding international law on June 15, 2007. These new regulations, unanimously approved by the World Health Assembly, differ in important ways from previous versions and represent a major step forward in protecting global public health security. Despite their importance, countries will face several challenges to implementing the regulations.
Many developing countries lack the capacity to detect and respond to public health emergencies, and developed countries may choose to act unilaterally. Decentralized states such as Canada will also face specific challenges to implementation. In May 2008, the Auditor General of Canada issued a report highlighting areas in which Canada has had difficulty complying with the new regulations.

The goal of the revised International Health Regulations are to protect against the international spread of epidemics and other public health emergencies without unnecessary interference with international travel and trade. To achieve this objective, the regulations provide new guidance to member states on several matters. The fundamental premise of the regulations is that preparation and early detection and response are essential to protect against global health emergencies. The regulations therefore require member states to assess their core capacity for effective public health surveillance and response within 2 years and meet requirements for core capacity within the subsequent 3 years.

The revised International Health Regulations have been criticized for subordinating health concerns to security and economic concerns. They have also been described as overemphasizing surveillance not placing enough emphasis on assistance for developing countries and lacking a legal mechanism to ensure compliance.

Despite these criticisms, the new regulations were unanimously approved by the WHO member states. All member states are bound by their requirements unless they specifically objected to them by the end of 2007. As of February 2008, no member states had rejected the regulations, 188 had designated National Focal Points, 76 had already conducted an assessment of their national core capacities, and 50 had nominated individuals to the International Health Regulations Roster of Experts. A number of countries, including Australia, Syria, Finland, Sweden, Columbia, France, Georgia and Germany, have already recognized the regulations as domestic law or have incorporated elements of the agreement into their national health legislation. A number of other countries, including Argentina, Spain, Brazil, South Africa and the European Community, have passed administrative regulations that cite the new International Health Regulations. Still other countries, including the United Kingdom are considering “all-hazards” approaches to the reform of their public health legislation. In spite of these efforts and the recognition of the importance of the regulations, several factors may prevent full national compliance. This is particularly true when compliance may leave countries, or regions within countries, vulnerable. Nevertheless, Under international law, there is a right not merely to health care but to the much broader concept of health. Because rights must be realized inherently within the social sphere, this formulation immediately suggests that determinants of health and ill health are not purely biological or “natural” but are also factors of societal relations. Thus, a rights perspective is entirely compatible with work in epidemiology that has established social determinants as fundamental causes of disease. The first notion of a right to health under international law is found in the 1948 Universal Declaration of Human Rights (hereafter called Declaration), which was unanimously proclaimed by the UN General Assembly as a common standard for all humanity. The Declaration sets forth the right to a “standard of living adequate for the health and well-being of himself and his family, including . . . medical care and . . . the right to security in the event of . . . sickness, disability . . . or other lack of livelihood in circumstances beyond his control. The Declaration does not define the components of a right to health; however, they both include and transcend medical care.

The language of progressive realization and maximal available resources, which suggests different standards for different countries, does not easily jibe with the absoluteness with which people in the world generally think about rights. Yet in practice, due process and other civil rights may vary just as much. Indeed, the egregious disparities among countries, suggest not the irrelevance of defining a right to health but rather the need to situate state obligations within a global political economy in which international institutions and third-party states often exercise inordinate influence over developing countries’ economies and policies. The right to health demands, as do all human rights, “international assistance and cooperation.

The reference to a “highest attainable standard” of health, taken from the World Health Organization constitution builds in a reasonableness standard. That is, the state has a role to play in leveling the social playing field with respect to health; however, there are factors that are beyond the state’s control. Furthermore, the highest attainable standard will necessarily evolve over time, in response to medical inventions, as well as demographic, epidemiological, and economic shifts.
In addition to the ICESCR, a wide array of international and regional treaties recognizes health as a rights issue, and these reflect a broad consensus on the content of the norms. A review of the international instruments and interpretive documents makes it clear that the right to health as it is enshrined in international law extends well beyond health care to include basic preconditions for health, such as potable water and adequate sanitation and nutrition.

Realization of the right to health further implies providing individuals and communities with an authentic voice in decisions defining, determining, and affecting their well-being. Public health has a long tradition of recognizing that participation is integral to health promotion. Further, analyses of the importance of structural determinants of health and political economic context are increasingly common. Framing health as a right adds to the growing literature in social epidemiology that links health with social justice; it does this by first making explicit the link between health and the construction of a functional democracy. That is, health-related resource distribution, evidence of discrimination and disparities, and the like are analyzed not just in terms of their impact on health status but also their relation to laws, policies, and practices that limit popular participation in decision-making and, in turn, the establishment of a genuinely democratic society.

Failure to respect, protect, or fulfill responsibilities relating to health are construed not only in terms of ensuing social or economic problems, but also explicitly in terms of the accountability of the state and, to a certain extent, other actors, under national and international law. Thus, a human rights framework simultaneously acknowledges health as inherently political—intimately bound up with social context, ideologies, and power structures—and removes health policy decisions from being matters of pure political discretion by placing them squarely into the domain of law.

Conclusions

This Essay has argued that the global community has an ethical and moral responsibility to take positive actions to achieve health equity and should do so through global and domestic tools in law, policy, and institutions. It has presented a set of normative principles—moral foundations—for global health law as guidance on critical health issues. It has argued that, while legal principles have existed over the past several centuries, a coherent set of normative principles, grounded in moral theory, has been lacking. This approach does not argue that the global community has an enforceable (coercible) legal duty. Rather, it envisions global health law embedded in a framework of global health governance, whose purpose is realizing global health equity. It achieves its purpose through the voluntary internalization of the public moral norm of health equity and through subsequent domestic law and policy development and implementation.

Public health officials have recognized the importance of collective action to manage international health emergencies. If countries fail to act, or act independently, it will result in a less than optimal response that will increase the harms to their citizens and disrupt the global economy. Compliance with the revised International Health Regulations is a critical step toward preventing this from happening. Canada, a key advocate for the regulations, should lead the way both by demonstrating its own compliance with the regulations and by championing their implementation in all countries.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon and all experiments were carried out in accordance with approved guidelines.

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Antioxidant Activity of Spirulina Powder in Male Rate with Adenine–Induced Chronic Renal Failure

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Abstract

The present study aimed to evaluate the role of spirulina in reducing the ability of adenine-induced renal failure and its complications in male rats. Twenty-four adult male rats used in the present study and divided into four groups, first group considered as control group, the second group received adenine (100 mg/kg) intraperitoneal, while the third group received mixed with feed and adenine (100 mg/kg) intraperitoneal combined with spirulina powder (750 mg/kg) and the fourth group received just spirulina powder (750 mg/kg) also with feed. The result showed a decrease in homeostasis for (KIM-1, Urea, and Creatinine), lipid profile function test for (cholesterol, triglyceride, LDL and HDL). Parameter of antioxidant concentration for (SOD, GSH, MAD, and NO). In the present study when treated by adenine group that showed increases in KIM, Urea, and Creatinine. The lipid profile results showed a significant increase (p≤0.05) in Cholesterol, TG, and LDL in the second group which administrated adenine while HDL was decreased in the same group. The results showed a significant decrease (p≤0.05) in the GSH, SOD, and increase in the MAD and NO in the second group. Spirulina powder showed significant enhancement in the most of parameters which studied to return near to the control group.

Keywords: Spirulina, Antioxidant, adenine–induced chronic renal failure.

Introduction

Kidneys are efficient organs that represent the main control system to maintain homeostasis of the body. They are affected by various chemicals and drugs that may affect the functions.

Kidney disease is one of the reasons that lead to the reduction quality of individual life in today's years. The kidneys of human are mainly participatory in liquidation and concentrating various materials and chemical factors that may reach a rise concentration and turn into toxic. Renal failure (RF) is considered pathologically deadly because of serious hormonal and metabolic disturbances. Whereas some models of animal renal failure are used to evaluate the pathogenic damage of organs pathogenesis. Chronic renal failure (CRF) results from irreversible and progressive damage of wide numbers of functioning nephrons. Renal toxicities, glomerulonephritis, and diabetic nephropathy may promote oxidative conditions, increase susceptibility of acute renal failure. The free radicals are one of the causes that lead to kidney failure. Oxidative stress is known as a main pathological process in renal failure which activates various pro-inflammatory cytokines and growth factors, finally leads to glomerulosclerosis, tubule-interstitial fibrosis, tubular cells apoptosis and senescence, as well as deactivated cellular regenerative pathways. Spirulina are indicated to filamentous free-floating microalgae with spiral characteristics of its filaments. It is officially called Arthrosporia sp powderspirulina have anti-oxidant properties and scavenge the free radicals' due to that effect in hepatic and renal failure induced rats.

Material and Method

Experimental Design: Using Healthy adult 24 male rats (11-12 weeks old, weighting initially 150-200 gm, divided equally and randomly in to four groups.
The first group (control negative) animal of this group will receive normal saline orally and the second group (control positive) rats in this group will be treated with spirulina (750 mg/kg) orally for 30 days and the third group animal of this group will gavage with adenine orally (100mg/kg) for 30 days to induce renal failure and the fourth group animal of this group will co-administrated adenine (100mg/kg) intraperitoneal and spirulina powder (750 mg/kg) orally for 30 days. After 30 days of experiment animals will be anesthetized and blood will be collected via cardiac puncture then after animal will be sacrificed to isolate liver and kidney in order to measure.

Parameter of study was:

Kidney function measured of (KIM-1, Urea and creatinine) according to manufacture (south Korea).

Lipid profile measured of (Cholesterol, TG, LDL and HDL) according to Fasce, 1982.

Liver function parameter of (AST and ALT) is determined by using a special kit (SPECTRUM AST – kit, Egypt- IFUFCC22 and SPECTRUM ALT – kit, Egypt- IFUFCC25).

Antioxidant of parameter (MAD, GSH, SOD and NO) the (MAD) was done according to 9, while parameter done by 8, the parameter done according to 10 and the (SOD) parameter. The procedure was done according to the instructions of the manufacture of ELIZA Kit -Elabscience biotechnology/china.

Result and Discussion

The data was statically analyses by using SPSS program by use one way ANOVA and differences between mean were compared with the least significant difference (LSD).

Table (1): The Effect of spirulina powder on kidney and liver function Parameters in Male Rats with induced chronic renal failure means ± SD

<table>
<thead>
<tr>
<th>Groups</th>
<th>Parameters</th>
<th>KIM Mg/dL ± SD</th>
<th>UEAR Mg/dL ± SD</th>
<th>CEART Mg/dL ± SD</th>
<th>AST U/ml ± SD</th>
<th>ALT U/ml ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>C116.04 ± 1.998</td>
<td>C21.33 ± 0.881</td>
<td>C0.26 ± 0.043</td>
<td>C95.16 ± 33.408</td>
<td>C45.50 ± 2.77014</td>
<td></td>
</tr>
<tr>
<td>Adenine</td>
<td>A395.27 ± 18.78</td>
<td>A71.16 ± 4.26</td>
<td>A3.49 ± 0.20</td>
<td>A325.83 ± 40.21</td>
<td>A102.83 ± 13.961</td>
<td></td>
</tr>
<tr>
<td>Spirulina and adenine</td>
<td>B175.86 ± 8.96</td>
<td>B37.16 ± 4.57</td>
<td>B1.81 ± 0.20</td>
<td>B145.16 ± 51.077</td>
<td>B68.33 ± 7.99</td>
<td></td>
</tr>
<tr>
<td>Spirulina</td>
<td>C106.10 ± 1.99</td>
<td>C26.50 ± 4.20</td>
<td>B1.47 ± 0.09376</td>
<td>C94.16 ± 46.70</td>
<td>C54.16 ± 5.47</td>
<td></td>
</tr>
<tr>
<td>LSD</td>
<td>12.03</td>
<td>6.23</td>
<td>0.46</td>
<td>46.8</td>
<td>12.3</td>
<td></td>
</tr>
</tbody>
</table>

N = 6 significant different between tow groups noted by letters (P≤ 0, 0 5)

A transmembrane protein with 90-kDa molecular weight called Kidney Injury Molecule_1 KIM-1. is over expressed found in proximal tubules of rat and has an important role in repair epithelial layer of renal tubule in rat kidney with ischemic injury. KIM-1 considered a remarkable biomarker for acute renal tubular kidney damage. The existing study accept with other previous studies. Aguiar et al.,(2015) found rise of kimi-1 concentration, in induction chronic renal failure in male rats, also, who reported elevation KIM-1 in patients with CRF in humans by comparison with control groups On the other hand, co-administration of spirulina powder with adenine in the present study causes a significant enhancement of the renal function indicators. Our results in coordinate with that reported by Gargouri et al., (2018) who found that spirulina protects neonate rat from leads-induced nephrotoxicity via its antioxidant properties. This enhancement in KIM, urea and creatinine Might be attributed to ability of phycocyanin (a biliproteins pigment found in spirulina components) to the accelerated regeneration of tubular malfunction that caused by adenine or due to a diuretic activity of the phycocyanin. In addition, Abdel-Daim (2014) reported that the presence potassium in alga which in turn possess a diuretic effect. beside, spirulina alga rich in flavonoids that can demonstrate the increase of diuresis because flavonoids cause polyuria.
Table (2): The spirulina powder Effect on biomarker of lipid profile in Male Rats with induced chronic renal failure means ± SE.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Groups</th>
<th>Chole, (mg/dL)</th>
<th>Triglycerides,(trig) (mg/dL)</th>
<th>Low density, lipoprotein, (LDL) (mg/dl)</th>
<th>High density lipoprotein, (HDL) (mg/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>D115.16±17.96</td>
<td>C46.36±3.59</td>
<td>B110.06±8.33</td>
<td>B31.16±2.023</td>
</tr>
<tr>
<td></td>
<td>Adenine</td>
<td>A217.16±13.58</td>
<td>A175.00±11.80</td>
<td>A198.16±10.06</td>
<td>C17.50±2.5</td>
</tr>
<tr>
<td></td>
<td>Spirulina and adenine</td>
<td>B171.66±14.63</td>
<td>A167.50±12.15</td>
<td>B107.50±6.91</td>
<td>BC23.09±2.89</td>
</tr>
<tr>
<td></td>
<td>Spirulina</td>
<td>C138.33±10.39</td>
<td>B73.83±4.96</td>
<td>C68.00±5.30</td>
<td>A42.11±2.023</td>
</tr>
<tr>
<td></td>
<td>LSD</td>
<td>9.74</td>
<td>5.28</td>
<td>4.33</td>
<td>3.45</td>
</tr>
</tbody>
</table>

N=6 Significant different between two groups noted by letters (P≤ 0.05)

Analysis of variance in the found study revealed significant increase in Cholesterol, TG and LDL level in the group of male rats injected intraperitoneally with adenine in comparison with control and other treated groups and our results in agreement with that reported by Ghelani et al., (2019)25. Elevation of LDL in serum of rat with adenine induced chronic renal failure, may be resulted from the downregulation of LDL receptors in responses to chronic renal failure26.

According total cholesterol increment in the present study could be occur as a result of the acceleration biosynthesis of cholesterol throughout the regulation of enzyme called HMG-CoA reductase 28 other explanation to rise cholesterol levels is due to a relative decrease of elimination of cholesterol via liver due to down-regulation of enzyme called cholesterol 7 α-hydroxylase (CYP7A1) in animals undergoing chronic kidney disease 30.

Elevation triglyceride in the blood of chronic kidney disease patients are most common among lipid abnormalities31-33. In addition, expression and activity of hepatic lipase protein is also reduced in rats with chronic kidney disease34. Treatment with spirulina along that showed decreases significantly in serum of LDL,Cholest and Trigly when comparative with group adenine . The HDL level significantly increase when comparative with group adenine .in this study reported with other study(Bhat et al.,2020). The hypo-lipaemic ability of spirulina was also reported in mice with alloxan-induced diabetes represented by reduce triacylglycerol and LDL as well as increase in HDL levels 37. The enhancement of lipid profile could be occurs secondarily to activation of AMP-activated protein kinase signaling pathway which lead to downregulates the gene expression that involved in synthesis of lipid such as 3-hydroxy-3-methyl glutaryl coenzyme A reductase, Sterol regulatory transcription element binding factor-1c, and acetyl Coa carboxylase 35. Moreover, spirulina has ability to change alter microbiota of gut to lowering effects of lipid via increase count. Studies have revealed an increase in abundance of Prevotella, which in turn increases metabolism of bile leading to reduce lipid levels in the blood. Formicates are another group of bacteria which have ability to reduce serum LDL concentrations, which improved with spirulina supplementation.

Table (3): The Effect of spirulina powder on Antioxidant Activity liver of Male Rats with induced chronic renal failure means ± SD

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Groups</th>
<th>GSH Ng/ml</th>
<th>SOD Ng/ml</th>
<th>MAD μM/l</th>
<th>No. μM/l</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>A9.82±1.13</td>
<td>A41.43±8.12</td>
<td>C82.44±12.21</td>
<td>C170.15±27.16</td>
</tr>
<tr>
<td></td>
<td>Adenine</td>
<td>C6.27±1.08</td>
<td>C24.83±4.53</td>
<td>A118.61±18.13</td>
<td>A195.27±11.92</td>
</tr>
<tr>
<td></td>
<td>Spirulina and adenine</td>
<td>B8.19±0.21</td>
<td>B34.64±3.68</td>
<td>B100.23±22.09</td>
<td>B181.42±13.12</td>
</tr>
<tr>
<td></td>
<td>Spirulina</td>
<td>A10.16±1.23</td>
<td>A38.90±4.51</td>
<td>C79.86±19.65</td>
<td>C171.83±10.21</td>
</tr>
<tr>
<td></td>
<td>LSD</td>
<td>1.21</td>
<td>4.11</td>
<td>13.74</td>
<td>9.18</td>
</tr>
</tbody>
</table>

N=6
Superoxide dismutases (SOD) is actually the first detoxifying enzymes in the cell and therefore the most effective antioxidants. It is considered as an endogenous antioxidant enzyme which acts as First line part protection mechanism against reactive oxygen species ROS

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of veterinary Medicine and all experiments were carried out in accordance with approved guidelines.

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19. O’Selghedha C, Hwang S, Larson M. Analysis of a


Psychosocial Disturbance of Hemodialysis Patients with Chronic Hepatitis B and C Virus Infection at Southern Provinces in Iraq

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Abstract

Psychosocial issues are an understudied yet important concern in the overall health of hemodialysis (HD) patients. Stress is a concomitant of chronic illness and its treatment, and may have meaningful influences on psychological and medical outcomes.

A descriptive study was carried out to determine Psychosocial Disturbance among hemodialysis patients with chronic hepatitis virus infection. A non-probability of (60) hemodialysis patients with chronic hepatitis B and C virus. Reliability of the questionnaire form was determined through a pilot study while the content validity of the questionnaire was determined through a panel of experts. And then the Data were collected through the use of the observational tool (questionnaire), which was analyzed through the use of three statistical approaches. They are descriptive statistical analysis (frequencies, percentage, S.D, range of scores, mean of scores and relative sufficiency; inferential statistical analysis (correlation coefficient and chi-square test); and analysis of variance (ANOVA). The study indicates that the Psychosocial domain has the effect due to hemodialysis with chronic viral hepatitis. The study indicated that the negative correlation between the socio-demographic and Psychosocial, except income, socioeconomic status at the social is relations/support domain. On the basis of the results of the study, the researcher recommends to sharing the health cover given and family members to provide psychological support for hemodialysis patients with chronic viral hepatitis accept their condition that maintain peaceful live.

Keywords: Psychosocial, Hemodialysis Patients, Patients, Chronic Hepatitis.

Introduction

Hemodialysis patients have lower immune responses and are at a higher risk for infections viral hepatitis continues to be a potential serious ailment among hemodialysis patients both chronic hepatitis B and C have been implicated to be the main causes of viral hepatitis among hemodialysis patients¹. Hemodialysis patients experience various problems that may adversely influence their quality of life. Hepatitis infection is also the most important problem in hemodialysis patients is that can affect their quality of life². This long survival with hepatitis leads to Disturbance of psychosocial patient even in the absence of clinically significant renal disease; in particular the impact of hepatitis seems to be most dramatic in social and physical function, general health and vitality, such as the effects of hepatitis on families, work environments, and on society as a whole³. Chronic hepatitis are often thought of as of the most severe types of injuries resulting in dramatic

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change in all aspects of the individuals’ life and having significant impact on their family and friends. Also the loss of control over the body functions and altered life style secondary be caused by hepatitis, as evidenced by verbalization of inability to cope, expression of anger or other negative feelings. Chronic diseases are associated with several psychosocial problems including quality of life, depression, anxiety and other psychological disorders. The measurement of psychosocial for patient is concerned with quantifying the judgments people make to describe their experiences of health and illness.

Material and Method

Design of the Study: A descriptive quantitative design was carried out through the present study in order to achieve the early stated objectives during the period from 8th of January, 2019 to the 5th of July, 2019.

Setting of the Study: The study has been conducted on the hemodialysis patients with chronic viral hepatitis B and C at AL-Basra/AL-Basra Health Directorate/AL-Basra Teaching Hospital/Hemodialysis Unit, Thi-Qar/Thi-Qar Health Directorate/AL- Hussein Teaching Hospital/Hemodialysis Unit, Misan/Misan Health Directorate/AL- Sader Teaching Hospital/Hemodialysis Units, Al-Muthanah/Al-Muthanah Health Directorate/AL- Hussein Teaching Hospital/Hemodialysis Unit.

The Sample of the Study: A non-probability (purposive sample) of (60) hemodialysis patients with chronic hepatitis B and C virus.

The Study Instruments: for the purpose of the present study, a questionnaire was constructed by the researcher to study the variable for assessment Psychosocial Disturbance of Hemodialysis Patients with Chronic Hepatitis. The questionnaire was constructed thorough reviewing of previous literature and related studies for Psychosocial Disturbance of Hemodialysis Patients with Chronic Hepatitis. The study instrument comprised of (3) parts these parts related to the following:

Psychological: Domain This domain was measured through (5) sub-domains of negative feelings (7) items; self-esteem (4) items; thinking (5) items; memory and concentration (4) items; and appearance and body image (3) items.

Conducting Pilot Study: A convenient sample of (10) patients were selected from the inpatients in studied hospitals for hemodialysis patients are diagnosed by chronic viral hepatitis B and C this preliminary study was conducted for the period of December 10th, 2018 until the December 20th 2018.

Determine the reliability of the questionnaire .Estimate the time required for the data collection. Obtain the clarity and the content adequacy of the questionnaire and observation Identify the barriers that may be encountered during the data collection process.

Validity: The validity of the instrument was established through a panel of (12) experts. who had more than five years’ experience in their fields in order to achieve study objectives.

Reliability: results of the reliability showed very high level of stability and internal consistency of principle parts concerning item’s responses’ of the questionnaire, all those were calculated by using the major statistical parameter: Alpha Cronbach, revealed that the person correlation coefficient is (0.73).

Statistical Analysis: The data analyzed through the application of statistical procedures and using the package of SPSS version (22).

Results

Table (1): Summary Statistics and Initial Assessment for Psychological Domain Towards patients According to Cutoff Point

<table>
<thead>
<tr>
<th>Items of the studied questionnaire</th>
<th>No.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>R.S. %</th>
<th>Ass.</th>
</tr>
</thead>
<tbody>
<tr>
<td>((The Psychological Domain))</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How did you feel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secluded from the rest of the people</td>
<td>60</td>
<td>1.83</td>
<td>0.78</td>
<td>61.0</td>
<td>Failure</td>
</tr>
<tr>
<td>Upset because someone Anted</td>
<td>60</td>
<td>1.63</td>
<td>0.76</td>
<td>54.3</td>
<td>Failure</td>
</tr>
<tr>
<td>Feel sad</td>
<td>60</td>
<td>1.67</td>
<td>0.57</td>
<td>55.7</td>
<td>Failure</td>
</tr>
<tr>
<td>Items of the studied questionnaire</td>
<td>No.</td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>R.S. %</td>
<td>Ass.</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>-----</td>
<td>-------</td>
<td>-----------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>You feel uptight</td>
<td>60</td>
<td>1.65</td>
<td>0.58</td>
<td>55.0</td>
<td>Failure</td>
</tr>
<tr>
<td>Quiet and peaceful</td>
<td>60</td>
<td>1.63</td>
<td>0.61</td>
<td>54.3</td>
<td>Pass</td>
</tr>
<tr>
<td>Dismal and crisis</td>
<td>60</td>
<td>1.68</td>
<td>0.57</td>
<td>56.0</td>
<td>Failure</td>
</tr>
<tr>
<td>Did you feel anxiety</td>
<td>60</td>
<td>1.73</td>
<td>0.66</td>
<td>57.7</td>
<td>Failure</td>
</tr>
<tr>
<td><strong>Self-Esteem</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did you suffer from the loss of real value, among others</td>
<td>60</td>
<td>2.00</td>
<td>0.55</td>
<td>66.7</td>
<td>Pass</td>
</tr>
<tr>
<td>Did you feel the burden on others</td>
<td>60</td>
<td>1.58</td>
<td>0.65</td>
<td>52.7</td>
<td>Failure</td>
</tr>
<tr>
<td>Did you feel the difference on people due to illness</td>
<td>60</td>
<td>1.82</td>
<td>0.57</td>
<td>60.7</td>
<td>Failure</td>
</tr>
<tr>
<td>Did you feel compassion and pity of others toward you</td>
<td>60</td>
<td>1.63</td>
<td>0.49</td>
<td>54.3</td>
<td>Failure</td>
</tr>
<tr>
<td><strong>Thinking</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suffer from thinking about the future of your health</td>
<td>60</td>
<td>1.38</td>
<td>0.61</td>
<td>46.0</td>
<td>Failure</td>
</tr>
<tr>
<td>Did you thinking about the cost of treatment</td>
<td>60</td>
<td>1.48</td>
<td>0.60</td>
<td>49.3</td>
<td>Failure</td>
</tr>
<tr>
<td>Suffer from thinking about the future of your family</td>
<td>60</td>
<td>1.48</td>
<td>0.65</td>
<td>49.3</td>
<td>Failure</td>
</tr>
<tr>
<td>Considering the length of the treatment period</td>
<td>60</td>
<td>1.38</td>
<td>0.61</td>
<td>46.0</td>
<td>Failure</td>
</tr>
<tr>
<td><strong>Memory and Concentration</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suffers from an inability to focus</td>
<td>60</td>
<td>1.97</td>
<td>0.71</td>
<td>65.7</td>
<td>Failure</td>
</tr>
<tr>
<td>Suffer from cluttered thinking</td>
<td>60</td>
<td>1.98</td>
<td>0.65</td>
<td>66.0</td>
<td>Failure</td>
</tr>
<tr>
<td>Experiencing difficulty understanding and learning</td>
<td>60</td>
<td>1.98</td>
<td>0.65</td>
<td>66.0</td>
<td>Failure</td>
</tr>
<tr>
<td>Suffers from oblivion</td>
<td>60</td>
<td>1.60</td>
<td>0.81</td>
<td>53.3</td>
<td>Failure</td>
</tr>
<tr>
<td><strong>Body and Appearance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feel that your body is different from others</td>
<td>60</td>
<td>2.12</td>
<td>0.67</td>
<td>70.7</td>
<td>Pass</td>
</tr>
<tr>
<td>Feel that your appearance cause you shame</td>
<td>60</td>
<td>2.17</td>
<td>0.67</td>
<td>72.3</td>
<td>Pass</td>
</tr>
<tr>
<td>Adhere to wear quality clothing</td>
<td>60</td>
<td>2.33</td>
<td>0.71</td>
<td>77.7</td>
<td>Pass</td>
</tr>
</tbody>
</table>

Mean of score (MS), standard deviation (SD), relative sufficiency (RS), Assessment (Ass).

This table (1) reveals the subjects responses of psychological domain in light of items of the sub domain named (how did you feel), shows failure assessment, since their relative sufficiency were under cutoff point, and they are accounted (61.0, 54.3, 55.7, 55.0, 54.3, 56.0, and 57.7) of the items (secluded from the rest of the people, upset because someone wanted, feel sad, you feel uptight, quiet and peaceful, dismal and crisis, and feel anxiety) respectively, then followed by sub domain named self-esteem, we can see that one subject’s responses had pass assessment, named (did you suffer from the loss of real value, among others) with critical pass assessment due to relative sufficiency (66.7%), while the leftover were reported failure assessment, and they are (did you feel the burden on others, did you feel the difference on people due to illness, did you feel compassion and pity of others toward you) and they are accounted (52.7, 60.7, 60.7, 54.3) respectively, then followed by sub domain named thinking, we can see that all subject’s responses had failure assessment, named, and they are (suffer from thinking about the future of health, thinking about the cost of treatment, suffer from thinking about the future of family, and considering the length of the treatment period) and they are accounted (46.0, 49.3, 49.3, and 46.0) respectively, then followed by sub domain named memory and concentration, we can see that all subject’s responses had Failure assessment, named, (suffers from an inability to focus, suffer from cluttered thinking, experiencing difficulty understanding and learning, and Suffers from oblivion) and they are accounted (65.7, 66.0, 66.0, and 53.3), then finally followed by sub domain named body and appearance, we can see that all subject’s responses had pass assessment, since their relative sufficiency were upper cutoff point and they are (feel that body is different from others, feel that appearance cause shame, and adhere to wear quality clothing) and they are accounted (70.7, 72.3, and 77.7).
### Table (2): Summary Statistics and Initial Assessment for Social relations/support Domain Towards patients According to Cutoff Point.

<table>
<thead>
<tr>
<th>Items of the studied questionnaire</th>
<th>No.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>R.S. %</th>
<th>Ass.</th>
</tr>
</thead>
<tbody>
<tr>
<td>((Social relations/support Domain))</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Relations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Convinced family relations</td>
<td>60</td>
<td>1.42</td>
<td>0.62</td>
<td>47.3</td>
<td>Pass</td>
</tr>
<tr>
<td>Convinced harmony with people</td>
<td>60</td>
<td>1.75</td>
<td>0.77</td>
<td>58.3</td>
<td>Pass</td>
</tr>
<tr>
<td>Convinced your social life and your relationships</td>
<td>60</td>
<td>1.73</td>
<td>0.69</td>
<td>57.7</td>
<td>Pass</td>
</tr>
<tr>
<td>Persuaded relations with the people</td>
<td>60</td>
<td>1.73</td>
<td>0.76</td>
<td>57.7</td>
<td>Pass</td>
</tr>
<tr>
<td>Material Support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Convinced owned funds</td>
<td>60</td>
<td>2.27</td>
<td>0.58</td>
<td>75.7</td>
<td>Pass</td>
</tr>
<tr>
<td>Important money for you</td>
<td>60</td>
<td>1.65</td>
<td>0.52</td>
<td>55.0</td>
<td>Failure</td>
</tr>
<tr>
<td>Prevents the lack of money to do what you want</td>
<td>60</td>
<td>1.93</td>
<td>0.45</td>
<td>64.3</td>
<td>Failure</td>
</tr>
</tbody>
</table>

Mean of score (MS), standard deviation (SD), relative sufficiency (RS), Assessment (Ass).

This table (2) shows the subjects responses of social relations/support domain in light of items of the sub domain named (social relations), shows pass assessment, since their relative sufficiency were under cutoff point and they had negative direction of the ascending ordinal scale for the liker score regarding their items, and they are accounted (47.3, 57.7, 58.3, and 57.7) of the items (convinced family relations, persuaded relations with the people, convinced harmony with people, and convinced social life and relationships) respectively, then finally followed by sub domain named material support, we can see that all subject’s responses had pass assessment, since their relative sufficiency were upper cutoff point and they are (convinced owned funds, and convinced control on your own money) and they are accounted (75.7, and 67.3), while the leftover items which were reported failure assessment, are (important money, and prevents the lack of money to do what you want) and they are accounted (55.0, and 64.3) respectively.

### Table (3): Association Between Basis Information and Socio-Demographical Characteristics Variables with an Overall (QoL) Assessments due to Main Domains According to “Under/Upper” Cutoff point

<table>
<thead>
<tr>
<th>Main Domain</th>
<th>Basis Information and Demographical Characteristics X (QoL) Ass. Status</th>
<th>Contingency Coefficients</th>
<th>Approx. Sig.</th>
<th>C.S. (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological</td>
<td>Hospital</td>
<td>0.190</td>
<td>0.520</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Age Groups</td>
<td>0.371</td>
<td>0.088</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>0.155</td>
<td>0.225</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Education Level</td>
<td>0.297</td>
<td>0.324</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Occupation</td>
<td>0.248</td>
<td>0.415</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Marital status</td>
<td>0.266</td>
<td>0.205</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Income</td>
<td>0.171</td>
<td>0.406</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Residency</td>
<td>0.018</td>
<td>0.889</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Crowding Index</td>
<td>0.057</td>
<td>0.658</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Socioeconomic Status</td>
<td>0.239</td>
<td>0.163</td>
<td>NS</td>
</tr>
<tr>
<td>Main Domain</td>
<td>Basis Information and Demographical Characteristics X (QoL) Ass. Status</td>
<td>Contingency Coefficients</td>
<td>Approx. Sig.</td>
<td>C.S. (*)</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------------------------</td>
<td>-------------------------</td>
<td>-------------</td>
<td>---------</td>
</tr>
<tr>
<td>Social relations/support</td>
<td>Hospital</td>
<td>0.258</td>
<td>0.234</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Age Groups</td>
<td>0.164</td>
<td>0.895</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>0.219</td>
<td>0.083</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Education Level</td>
<td>0.288</td>
<td>0.366</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Occupation</td>
<td>0.252</td>
<td>0.398</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Marital status</td>
<td>0.230</td>
<td>0.341</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Income</td>
<td>0.353</td>
<td>0.014</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Residency</td>
<td>0.047</td>
<td>0.717</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Crowding Index</td>
<td>0.074</td>
<td>0.566</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Socioeconomic Status</td>
<td>0.325</td>
<td>0.029</td>
<td>S</td>
</tr>
</tbody>
</table>

(*) NS : Non Sig. at P>0.05; S : Sig. at P<0.05

To predicting/or to find out the relationship between quality of life (QoL) domains and socio-demographic characteristics variables, correlation ship through the contingency coefficient of the contingency tables had been constructed in table (3) which were illustrated and testing the effectiveness distribution among different levels of the predicted variables and the two categories of an overall responding of assessment which were reported (under/upper) cutoff point at score value (2) for the Global Mean of Score.

The results has reported that the Socio-demographic characteristics variables (hospital, age groups, gender, education level, occupation, marital status income, residency, crowding index, and socioeconomic status) had no relationship with their overall (QoL) assessments due to main domains according to “Under/Upper” cutoff point for the grand mean of score values at each of the studied main domains, since a non-significant correlation ships were obtained at P>0.05 except with gender factor at the physical status domain, and income, socioeconomic status at the social relations/support domain, and we could conclude that the studied quality of life (QoL) questionnaire can be amend for all individual’s population of “Hemodialysis Patients with Chronic Hepatitis B and C Virus Infection at Southern Provinces in Iraq” whatever a differences with their (Socio-demographic characteristics variables) would be. Relative to the table (1) the majority of the study sample individuals 48(80%) are accounted at Al-Basra Hospital and the remaining are distributed at the others hospitals. This result also comes in agreement with Jawad et, al., 7 who stated of HCV antibody majority of the study sample(41%) among HD patients in the Al-kadymia Teaching Hospital and the remaining are distributed at the others hospitals in hemodialysis unit.

Conclusions

A highest percent of the study sample were females more than males, they were illiterate, read and write, and primary school and married. They were unemployed, with good assessment crowding index, having low monthly income,mostly common occurs among patients in urban residential area more than in rural, with many complications involves all the body systems. The study indicates that the Psychosocial domain has the effect due to hemodialysis with chronic viral hepatitis . The study indicated that the negative correlation between the socio-demographic and Psychosocial, except income, socioeconomic status at the social is relations/support domain.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College Of Nursing, Iraq and all experiments were carried out in accordance with approved guidelines.

References


Factors Related to Vulvovaginal Itching and Discharge among Iraqi Women

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Abstract

Background: Vaginal infections are considered global health problems for women in child-bearing ages. At the time in which various pathogenic organisms are responsible for those infections, many risk factors may also be attributed for such infections, including sexual activity and partner, contraceptive use, personal hygiene level, female estrogen level and its effect on vaginal mucosa, medical history, and many other factors. However, the disease by itself is not considered an exclusive sexually transmitted infection.

Objective: The goal of the Study is to identify the causes and factors related to the symptoms of vulvovaginal itching and/or vaginal discharge.

Methodology: A cross sectional study conducted on 93 females (16 pregnant & 77 non pregnants females) attending the private clinics in Al-Hindiya district (Karbala governorate) from May 2019 to September 2019. Ethically, patients’ information was treated with confidentiality and privacy throughout data collection and analysis. Tow swabs had been taken from each patient (vaginal and cervical) and sent to a private lab for direct microscopic examination and culturing on appropriate media. Statistically, the quantitative variables were analyzed using non-parametric t-test and the qualitative variables were analyzed using Chi-square test.

Results: Fortunately, the age of all participants was within child-bearing age ranging 15 to 42 with a mean of 28.0 ± 6.9 years. There was no significant association of pregnancy with vaginal infections as noticed in this study, while diabetes mellitus (DM) was found to be significantly related to the presence of infection (P-value=0.003). Similarly, intrauterine contraceptive device (IUCD) usage was also found to be significantly related to the occurrence of infection (P-value = 0.040).On the other, the lab study showed that E. coli is the most common pathogen to be expected in women complaining of vulvovaginal itching and/or vaginal discharge with monilia being the second.

Conclusions: DM and IUCD usage had their burdens on the vaginal cavity causing increasing rate of vaginal symptoms as proven significantly. Simultaneously, the cultivation results revealed that E.coli is the causative agent for of vulvovaginal itching and/or vaginal discharge at the level of our females, a point meriting further evaluation.

Keywords: Vulvovaginal itching, vaginal discharge, vaginal and cervical swabs, E.coli.

Introduction

Vaginal infections are considered some of the most important health problems for women all around the world[1]. Various pathogenic organisms are responsible for those infections, including bacterial vaginosis, candidiasis, and trichomoniasis[2]. Bacterial vaginosis is considered a clinical syndrome of multiple pathogens that results from replacement of Lactobacilli species (which are normally found in vagina) with anaerobic bacterial[3].

Patients are usually presented with symptoms of itching or burning sensation in the vulva or vagina,
abnormal vaginal discharge, or irritation and discomfort. Some of the infections are reported to be present with minimal symptoms[4]. Many risk factors were suggested for bacterial vaginosis, including sexual activity and contraceptive use, although the disease itself is not considered an exclusive sexually transmitted infection[5].

Several complications may occur as a result of vaginal infections, such as pelvic inflammatory disease (PID) that may lead to further consequences such as infertility, ectopic pregnancy, preterm labour, and low birth weight[6, 7].

Diagnosis is usually achieved by clinical examination alone or with the aid of laboratory diagnosis. Classically using direct microscopic exam or cultivation for vaginal swabs[8]. The study aims to identify the causes and factors related to the symptoms of vulvovaginal itching and discharge.

**Patients and Method**

A cross sectional study conducted on a randomly selected 93 females (16 pregnant & 77 non pregnant females fulfilled all inclusion and exclusion criteria) attending the private clinics in Al-Hindiya district (Karbala governorate) from May 2019 to September 2019. Ethically verbal informed consent was obtained from all the patients who were enrolled in data collection after explaining the objectives of the study. Patients’ information was treated with confidentiality and privacy throughout data collection and analysis. Also, patient’s permission had been taken to publish the study.

Data including demography, gravida/para/abortus (GPA), medical history, previous vaginal infections, contraceptive method as well as clinical examination were collected using specially designed format. Tow swabs had been taken from each patient (high vaginal and endocervical) and sent to a private lab where, after processing according to the standard laboratory procedures, a direct microscopic examination done for the vaginal swabs and culturing on appropriate media for the cervical swabs.

The direct microscopic examination done by wet preparation of vaginal swabs, where we looked for epithelial cells, bacteria adherent to epithelial cells, Lactobacilli as their presence in suitable number indicate healthy vagina, and also for polymorphonuclear (PMN) cells. Sometimes, motile bacteria could be seen, giving a correct diagnosis of infecting micro-organism.

Unfortunately, the direct examination of vaginal swabs was inconclusive for most of the patients, which may be due to very superficial swabbing or lab technical errors.

The cervical swabs had processed and each one cultivated on two separated agars, MacConkey, and blood agar, then incubated at 37c for 24 hour in an aerobic environment. The growth of colonies revealed 1-2 days after cultivation. The plates which had demonstrated bacterial colonies, sent for identification of the type of bacteria using the VITEK 2 compact (automated microbiology system of bioMerieux).

**Principles of VITEK2 system:** This system utilizes growth-based technology and accommodates a colorimetric reagent cards that are incubated and interpreted automatically. There are four reagent cards that currently used for the identification of different organisms:

1. GN –Gram negative fermenting and non-fermenting bacilli
2. GP -Gram positive cocci and non-spore forming bacilli
3. YST –yeast and yeast-like organisms
4. BCL –Gram positive spore forming bacilli

The reagent cards have 64 wells that can each contain an individual substrate. Substrates measure the various metabolic activities such as acidification, alkalinization, enzyme hydrolysis, and growth in the presence of inhibitory substances. An optically clear film present on both sides of the card allows for appropriate level of oxygen transmission while maintaining a sealed vessel that prevents contact with organism-substrate admixture. Each card has bar code, lot number, expiration date, and a unique identifier.

Statistical Package for Social Sciences (SPSS®) Software version 23.0 was used to perform statistical analysis. Qualitative data are presented as number and percentage, while continuous numerical data are presented as mean ± standard deviation. Comparisons between study variables were carried out using Chi-square test for categorical data and Student’s t-test for numerical data. P-value of < 0.05 was considered statistically significant.

**Results**

**Demographic characteristics of patients:** This
study enrolled a total of 93 patients complaining of vulvovaginal itching and/or vaginal discharge. The patients’ age ranged from 15 to 42 years, with a mean of 28.0 ± 6.9 years (Figure 1).

In regards to the gravida/para/abortus (GPA) system; the median gravida score of study participants was 3 (G3), median para score was 3 (P3), and median abortus score was 0 (A0). However, these information had not represented by a figure.

![Figure 1: Age group distribution of the study participants](image)

**Association of DM, pregnancy, and IUCD usage with vaginal infections:** To assess the role of DM, pregnancy, and IUCD usage on the occurrence of infection; those variables were compared to the presence of infection using chi-square test.

1. DM was found to have significant relationship with the presence of infection among patients in the study (P-value = 0.003). More than 83% of diabetic patients had infection, while approximately 38% of non-diabetic patients had infection. The odds ratio for diabetic patients to have an infection was calculated to be 3.7.

2. Association of pregnancy with vaginal infections had shown no statistically significant relationship, with chi-square = 0.34, d.f. = 1, P-value = 0.560, as presented in Table 1.

3. Fisher Exacts test was used to assess the association of IUCD use with vaginal infections and there was a statistically significant relationship between IUCD usage and presence of infection, Fisher Exacts P-value = 0.040, as described in the table below. Odds ratio was found to be 2.68. Infection was present in about 77% of women who used IUCD, while it was present in only 40% of women not using IUCD.

**Table 1: Association of DM, pregnancy, and IUCD usage with vaginal infections:**

<table>
<thead>
<tr>
<th>Patient history of DM</th>
<th>Presence of bacterial/fungal growth No. (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>Diabetic</td>
<td>10 (83.33%)</td>
<td>2 (16.67%)</td>
</tr>
<tr>
<td>Non-diabetic</td>
<td>31 (38.27%)</td>
<td>50 (61.73%)</td>
</tr>
<tr>
<td>Total</td>
<td>41 (44.09%)</td>
<td>52 (55.91%)</td>
</tr>
</tbody>
</table>

Chi-square = 8.61, d.f. = 1, P-value = 0.003
Association of patient’s age with vaginal infections: No significant relationship was found between presence of infection and the age of the patient, with a Student’s t-test = 0.40, d.f. = 91, P-value = 0.687, as detailed in Table 2.

### Table 2: Association of patient’s age with vaginal infections:

<table>
<thead>
<tr>
<th>Presence of bacterial/fungal growth</th>
<th>Age (years)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Median</td>
</tr>
<tr>
<td>Present (n=41)</td>
<td>27.7± 6.7</td>
<td>26.0</td>
</tr>
<tr>
<td>Absent (n=52)</td>
<td>28.3± 7.2</td>
<td>28.0</td>
</tr>
<tr>
<td>Total (n=67)</td>
<td>28.0± 6.9</td>
<td>27.0</td>
</tr>
</tbody>
</table>

Pathogenic agents causing vaginal infections: The most common pathogen found among study participants was *E. coli*, with a percentage of more than 32%, as illustrated in Figure (2). The next most common infection was *monilia*, comprising 10% of the study population, half of which was concomitant with *E. coli* infection.
Association of DM, pregnancy, and IUCD usage with pathogenic agents: To further extend the analysis, each pathogenic organism was compared to DM, pregnancy, and IUCD usage.

1. DM was found to have significant relationship to *E. coli* infection, but not to the other types of infection (Table 3).

2. On the other hand, neither pregnancy nor IUCD use were found to have statistically significant relationship with a particular type of infection (pathogenic agent).

### Table 3: Association of DM, pregnancy, and IUCD usage with pathogenic agents:

<table>
<thead>
<tr>
<th>Patient history of DM</th>
<th>Type of growth No. (%)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E. coli</td>
<td>Streptococcus</td>
<td>Monilia</td>
</tr>
<tr>
<td>Diabetic (n=12)</td>
<td>10 (83.33%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Non-diabetic (n=81)</td>
<td>19 (23.46%)</td>
<td>7 (8.64%)</td>
<td>10 (12.35%)</td>
</tr>
<tr>
<td>Total (n=93)</td>
<td>29 (31.18%)</td>
<td>7 (7.53%)</td>
<td>10 (10.75%)</td>
</tr>
<tr>
<td>P-value</td>
<td>&lt; 0.001</td>
<td>0.589</td>
<td>0.350</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pregnancy status</th>
<th>Type of growth No. (%)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E. coli</td>
<td>Streptococcus</td>
<td>Monilia</td>
</tr>
<tr>
<td>Pregnant(n=16)</td>
<td>5 (31.25%)</td>
<td>1 (6.25%)</td>
<td>1 (6.25%)</td>
</tr>
<tr>
<td>Non-pregnant(n=77)</td>
<td>24 (31.17%)</td>
<td>6 (7.79%)</td>
<td>9 (11.69%)</td>
</tr>
<tr>
<td>Total (n=93)</td>
<td>29 (31.18%)</td>
<td>7 (7.53%)</td>
<td>10 (10.75%)</td>
</tr>
<tr>
<td>P-value</td>
<td>0.995</td>
<td>0.832</td>
<td>0.523</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IUCD usage</th>
<th>Type of growth No. (%)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E. coli</td>
<td>Streptococcus</td>
<td>Monilia</td>
</tr>
<tr>
<td>Used (n=9)</td>
<td>5 (55.56%)</td>
<td>2 (22.22%)</td>
<td>2 (22.22%)</td>
</tr>
<tr>
<td>Not used (n=84)</td>
<td>24 (28.57%)</td>
<td>5 (5.95%)</td>
<td>8 (9.52%)</td>
</tr>
<tr>
<td>Total (n=93)</td>
<td>29 (31.18%)</td>
<td>7 (7.53%)</td>
<td>10 (10.75%)</td>
</tr>
<tr>
<td>P-value</td>
<td>0.131</td>
<td>0.326</td>
<td>0.248</td>
</tr>
</tbody>
</table>

### Discussion

Women included within this study were aged between 15-42 years, which roughly represent the reproductive age in women. The highest proportion of patients was within the age group 25-29 years, representing the peak age of sexual activity and the sequel of vaginal symptoms.

Given the increasing rate in vaginal infection among females, many interfering factors to be verified due to their impact in causing vaginal symptoms including, patient’s general health, medical history, sexual activity and sexual partner, pregnancy, type of contraceptive used, PH, change in hormonal balance, poor vaginal hygiene or over use of vaginal douches or perfumed spray, antibiotic and immunosuppressive drugs use, underwear quality, degree of moisture, concomitant infections, frequency of changing pads during period, the way of washing in toilet, and others.

Statistical analysis of patients’ data had demonstrated the following important points:

1. DM has a significant impact in causing infection among young women, with odds ratio of 3.7. This means that diabetic women are approximately 4 times more likely to develop vulvovaginal infection than non-diabetic women. This finding is consistent with the finding by Nowakowska et al. in their case-
control study conducted on 251 women, in which they concluded that risk for vaginal infection is more than 4 times higher in women with DM compared to control group[9].

2. Although all of us agree that pregnancy lowers the immune response of pregnant female making her more susceptible to infection, this study reflects a non-significant effect of pregnancy on the occurrence of vulvovaginal infection. Proportion of pregnant females who had positive result for infection was found to be 37.5%. This percentage was closely similar to the finding by Mengistie et al. in their study conducted on 252 pregnant females from 2011 to 2012, which found that 36.7% of symptomatic pregnant women included in the study had positive microbiological diagnosis[10].

3. At the time in which IUCD has important role in preventing pregnancy, noticeable side effects on the womb had been reported ranging between heavy menses to recurrent vaginal infection, and to be tolerated by the users. Here it was found that more than 77% of women who used IUCD had positive result for infection, compared to 40% of women who did not use IUCD. This finding is consistent with the finding by Jabuk S. in her study conducted in Al-Hilla city from 2012 to 2013, which included 50 women who used IUCD, which concluded that IUCD use significantly increased the risk for bacterial vaginosis compared to other contraceptive method[11].

4. An interesting observation in the study was the significant relationship between diabetes and specific type of microorganisms, namely E. coli., where we always thinks that Candida albicans is the dominant in DM patients. This could reflect the opportunistic nature for this microorganism which is important to note in patients with DM[12]. However, further evaluation is needed to elucidate their opportunity. The second important point is that E. coli. is normal inhabitant of rectum and their transport to vagina may indicate poor hygiene with retrograde (recto-vaginal) washing, where changing PH and effect of female hormones may alter these bacteria into pathogenic type causing infection.

Conclusions

This study has demonstrated that: vaginal infections may occur at any point of reproductive age of patients, where some factors may increase their susceptibility, and the most common infection to be expected in women complaining of vulvovaginal itching and/or discharge is E. coli. A significant relationship between IUCD usage and DM in occurrence of infection, Vaginal infections particularly with E. coli. are closely related to DM.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Al- Hindiya general hospital and all experiments were carried out in accordance with approved guidelines.

References


Assessment of Nurses Efficiency Regarding their Performance in the Operating Rooms at Three Teaching Hospitals in Baghdad

Shatha Saadi Mohammad¹, Wefaqq Mahdi Hadi²

¹Assist. Professor, ²Assist. Lecturer College of Nursing, University of Babylon

Abstract

For the purpose of assessing the performance competency of the operating room nurses in Baghdad’s hospitals, a descriptive study has been conducted from 13th of December 2020 through 13 March 2020. The settings of the performed study were Al-Kindey hospital, Al-Yarmouk Hospital, Baghdad teaching hospital in Baghdad city. For the study of (50) nurses who have been working definitely in the operating room in these hospitals, a purposeful sample has been selected.

For the study purpose, a special tool has been developed which has been used for data collection. There are three part compromising this tool which are dealing with performance of the nurse, demographic data, and affordability of equipment and supplies in the operating room.

A number of highly qualified experts have been asked to assess the validity of the questionnaire, where they confirmed its validity. As for the questionnaire’s legitimacy; it was specified according to the statistically acceptable person correlation coefficient of (r= 92).

Data has been analyzed by using analysis of descriptive data (frequencies, percentages) and inferential data analysis (SPSS, 23).

According to the conclusions that have been revealed by study, graduates from universities and institutes had showed a better practices performance than graduates from primary and secondary level.

The study also indicate that scrub nurse practices in some domains were satisfactory (rehearsal of scrub nurses prior to actually entering OR, wearing operating clothes and gloves, draping and sheeting) and inadequate in some fields (practices concerned with surgical preparation, surgical hand scrub, antiseptic and technique and surgical instruments)).

In the study between sexes, a non-significant variation illustrate years of experience in relation to the nurses’ training sessions in OR.

The investigation suggested that all nurses ought to circulate strategies to the staff concerning this issue; composed arrangements for the OR practice can be shared to the health-care providers for better execution, and supplies to hospitals such as antiseptic hand scrub strategies that inhibit pathogenic microorganism growth.

Keywords: Assessment, nurses’ efficiency, operating rooms.

Introduction

These days’ hospitals are furnished with working theater suites with entrance and rehabilitation units supplying several operating theatres, all with anesthetic, implantation, immediate recovery and scrubbing rooms¹. In surgical services, surgeons, nursing staff, and anesthesia personnel may differ in their conceptions of efficiency, and their motivation to achieve efficient
processes\(^2\). All patients and health-care providers are at a higher risk of infection throughout medical procedures due to microorganism exposure. The right attire of surgery can help in post-procedural infection in patients beside the other elements of aseptic strategies, this can be achieved due to decreasing the opportunity of microorganisms entrance into the patients’ body\(^3\). A few components of surgical apparel are as well configured to lower the risk of exposure of health-care professional to potential blood and tissue infections during surgical treatment, including gloves, caps, masks, gowns, protective eyewear and waterproof aprons\(^4\). Throughout any medical procedure, the most prevalent cause of infection is personals in the operating room. The main focus is thus on keeping the nursing and medical staff aside from the sterilized gowns and caps that were first revealed to be included in the operating room use\(^5\).

Throughout surgeries, infection in the surgical wound can be precipitated by transferring germs and bacteria from the surgical team’s hands for careful surgical scrubbing to lower the amount of bacteria on the skin\(^6\). Among the main reasons of mortality and morbidity is nosocomial or hospital-acquired infection in the hospitalized patients, hospital-acquired infection development can affected by some elements, and cross-infection from patients to patients can take many routes which will lead to a difficulty in making a link between these variable person and nosocomial infection\(^7\). Nosocomial infection is significantly correlated the infection at the surgical site. Most of the risk factors for nosocomial infection have involved the behavior of operating room personnel with relation to the practice of contamination by hand hygiene/antisepsis and universal precaution\(^8\). Nursing staff who work in the theatre can play a great part in the surgical site prevention of infection by undertaking preoperative scrub nurse. In addition, aseptic barriers including sterile gowns and gloves protect sterile areas, isolate clinical sites from pollutants caused by infections and lessen microorganisms number\(^9\).

### Methodology

This descriptive research was carried out to assess the nurse’s efficiency performance at the operating rooms in three surgical hospitals in Baghdad.

The study started from 13th of December 2020 through 13 March 2020. The sample was non-probability (purposive sample) of 50 nurses was selected from three surgical hospitals in Baghdad and they accepted to participate in the study and taken into consideration: age, gender, and level of education.

The data were collected by interviews and constructed with nurses efficiency performance at the operating room questionnaire, after getting the permission of Ministry of Health prior to the initiation of the study.

The agreement of participation was obtained from the nurses who were working in the operating room in these hospitals for this present study and they were responding to the interviewing.

Pilot study have evaluated the questionnaire’s validity and a group of experts to assess the validity. The data were analyzed by applying inferential statistical procedures, percentage, and descriptive statistical frequency. A questionnaire format constructed following enormous review of the available literature and related studies. There are two components of a questionnaire format which include: demographic data for nurses, gender, level of education, and years of experience in hospitals, years of experience in operating room, number of training sessions.

The other part observational questionnaire about the nurses practice in the operating room including scrubbing, equipment and supplies availability, and the nurses usage of the aseptic technique in surgical procedures.

### Results

**Table (1): Distribution of demographic characteristics of the nurses**

<table>
<thead>
<tr>
<th>Demographic characteristics of the nurses</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1-Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>39</td>
<td>78.0</td>
</tr>
<tr>
<td>Female</td>
<td>11</td>
<td>22.0</td>
</tr>
<tr>
<td>Demographic characteristics of the nurses</td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>---</td>
<td>----</td>
</tr>
<tr>
<td>2-Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>40</td>
<td>80.0</td>
</tr>
<tr>
<td>Married</td>
<td>10</td>
<td>20.0</td>
</tr>
<tr>
<td>3-Educational status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>9</td>
<td>18.0</td>
</tr>
<tr>
<td>Secondary</td>
<td>5</td>
<td>10.0</td>
</tr>
<tr>
<td>Graduated</td>
<td>24</td>
<td>48.0</td>
</tr>
<tr>
<td>Higher Education</td>
<td>12</td>
<td>24.0</td>
</tr>
<tr>
<td>4-Years of experience in hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5</td>
<td>32</td>
<td>64.0</td>
</tr>
<tr>
<td>6-10</td>
<td>11</td>
<td>22.0</td>
</tr>
<tr>
<td>11-15</td>
<td>6</td>
<td>12.0</td>
</tr>
<tr>
<td>&gt;16</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>5-Years of experience in OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5</td>
<td>32</td>
<td>64.0</td>
</tr>
<tr>
<td>6-10</td>
<td>14</td>
<td>28.0</td>
</tr>
<tr>
<td>11-15</td>
<td>4</td>
<td>8.0</td>
</tr>
<tr>
<td>6-Number of training sessions in OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>6</td>
<td>12.0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>2</td>
<td>42</td>
<td>84.0</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Table (2): Frequency and percentages and mean for nurse’s performance

<table>
<thead>
<tr>
<th>Practice</th>
<th>Mean Score</th>
<th>F</th>
<th>%</th>
<th>F</th>
<th>%</th>
<th>F</th>
<th>%</th>
<th>F</th>
<th>%</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Scrub nurses preparation before entering the OR</td>
<td></td>
<td>14</td>
<td>82.3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>17.7</td>
<td>17</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>2-Surgical hand scrub</td>
<td></td>
<td>9</td>
<td>47</td>
<td>2</td>
<td>11.7</td>
<td>6</td>
<td>41.3</td>
<td>17</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>3-Clothes &amp; gloves of operation</td>
<td></td>
<td>7</td>
<td>87.5</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>12.5</td>
<td>8</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>4-Draping &amp; sheets</td>
<td></td>
<td>6</td>
<td>75</td>
<td>1</td>
<td>12.5</td>
<td>1</td>
<td>12.5</td>
<td>8</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>5-Practice during surgical operation</td>
<td></td>
<td>17</td>
<td>84.5</td>
<td>2</td>
<td>10.0</td>
<td>1</td>
<td>5.0</td>
<td>20</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>6-Antiseptic solution &amp; surgical instrument</td>
<td></td>
<td>2</td>
<td>50</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>50</td>
<td>4</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>55</td>
<td>72.9</td>
<td>5</td>
<td>6.75</td>
<td>14</td>
<td>20.25</td>
<td>74</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
Table (3) Association between sex of the nurses & their practices in OR

<table>
<thead>
<tr>
<th>Nursing Practice</th>
<th>Very Good F</th>
<th>%</th>
<th>Good F</th>
<th>%</th>
<th>Fair F</th>
<th>%</th>
<th>Total F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>16</td>
<td>94.1</td>
<td>16</td>
<td>64.0</td>
<td>7</td>
<td>87.5</td>
<td>39</td>
<td>78.0</td>
</tr>
<tr>
<td>Female</td>
<td>1</td>
<td>5.9</td>
<td>9</td>
<td>36.0</td>
<td>1</td>
<td>12.5</td>
<td>11</td>
<td>22.0</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>100.0</td>
<td>25</td>
<td>100.0</td>
<td>8</td>
<td>100.0</td>
<td>50</td>
<td>100.0</td>
</tr>
</tbody>
</table>

$\chi^2_{obs} = 5.850$  $df = 2$  $\chi^2_{crit} = 5.991$  $P > 0.0$

Table (4): Association between educational level of the nurses and their practices in OR

<table>
<thead>
<tr>
<th>Nursing practice</th>
<th>Very good F</th>
<th>%</th>
<th>Good F</th>
<th>%</th>
<th>Fair F</th>
<th>%</th>
<th>Total F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>8</td>
<td>47.0</td>
<td>3</td>
<td>12.0</td>
<td>1</td>
<td>12.5</td>
<td>12</td>
<td>24.0</td>
</tr>
<tr>
<td>Institute</td>
<td>7</td>
<td>41.2</td>
<td>12</td>
<td>48.0</td>
<td>5</td>
<td>62.5</td>
<td>24</td>
<td>48.0</td>
</tr>
<tr>
<td>Secondary</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>20.0</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>10.0</td>
</tr>
<tr>
<td>Primary</td>
<td>2</td>
<td>11.8</td>
<td>5</td>
<td>20.0</td>
<td>2</td>
<td>25.0</td>
<td>9</td>
<td>18.0</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>100.0</td>
<td>25</td>
<td>100.0</td>
<td>8</td>
<td>100.0</td>
<td>50</td>
<td>100.0</td>
</tr>
</tbody>
</table>

$\chi^2_{obs} = 11.863$  $df = 6$  $\chi^2_{crit} = 12.592$  $P > 0.05$
Table (5): Association between nurses practices and their experiences in OR

<table>
<thead>
<tr>
<th>Nursing practice</th>
<th>Very good</th>
<th>Good</th>
<th>Fair</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of experiences in OR</td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>1-5</td>
<td>14</td>
<td>82.4</td>
<td>12</td>
<td>48.0</td>
</tr>
<tr>
<td>6-10</td>
<td>2</td>
<td>11.8</td>
<td>11</td>
<td>44.0</td>
</tr>
<tr>
<td>11-15</td>
<td>1</td>
<td>5.9</td>
<td>2</td>
<td>8.0</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>100.0</td>
<td>25</td>
<td>100.0</td>
</tr>
</tbody>
</table>

$\chi^2_{obs} = 8.687 \ df = 4 \ \chi^2_{crit} = 9.488 \ P > 0.05$

Discussion

Working in a team is essential for successful surgery, even though there are presently no team cohesion indicators to direct training, to analyses the effect of group work on consequences, the researcher will report the first stages in the development of an observational teamwork evaluation and preliminary findings. In this study we found that the majority of the nurses were males, (78%) graduated, (48%) single, (80%) having (1-5) years of experience in hospital and OR (64%), and they had enrolled in (2) time training sessions (84%) (Table 1) These results coincided with (Shabnam 2006), findings in his study of the sample consisted from 50 nurses who worked actually in OR and most of them were males, single but their practices were found to be unsatisfactory in OR. It has been realized that the scrub nurses in the examination of table (2) did not perform their practice of preparation before entering OR in many sub-terms of this preparation although there was a high MS in the domains of (1,3,4,5) related to the performs of practice for preparation before entering OR. Conducted a stated that reported scrub nurses should take bath daily with soap that contains an antibacterial agent, which can reduce shedding. Also, the present study realized that in sub-items in this domain that (20%) of those scrub male nurses did not shave their face. Stated that hair face could be considered a major source of staphylococci. Furthermore, the nurses had put the mask before surgical hand scrub (100%) and they do not touch surgical instruments by hand after the surgical hand scrub (98%). Relative to their practice in the OR, they also observed adequate practice, which was presented through using a sterilizing brush in the hand surgical scrubbing, and they used it between fingers (88%). On the other side, the nurses did not use woods, nail cleaner under nails, and antiseptics solution at the beginning because the supplies were not available in the hospitals. As noted by in his study that the (WHO) The hospital embraced hand hygiene protocols which its research carried out on a team that made comprehensive workflow diagrams for prevalent patient care duties identifying evidence of hand washing. Three months later, health care staff have been equipped to evaluate one another and forwarded relevant information to the Department of Infection Prevention and Control Following the launch of the program, conformance expanded from 60% - 70% to 97% and remains to be maintained at that point. Adequate performance of practice was presented through wearing the gown and gloves and raising the sterilizing hand above hips. In addition, proper surgical attire reduces the danger of clients infection with post-procedures by lowering micro-organisms entering locations of the client’s body throughout the surgery. Revealed that appropriate surgical apparel can diminish the risk of post-procedure infections in clients by decreasing microorganisms that enter the area of the client’s body during the procedure. Throughout data analysis, the study findings had confirmed that all scrub nurses, regardless of their sex has performed adequate practice in the operating room. Conducted a stated that staff nurses had performed adequate practices than practical ones in OR. Concerning the experiences in OR, the study shows that the scrub nurses’ practice was not influenced with years of experience because the correlation between their practices and years of experience was found to be not significant for all domains, but the scrub nurses who had (1-5) years of experience had high –level practice than others. The findings shows that beginner scrub training is influenced externally by its perioperative...
cultural environment and the encourage of senior employees. To sum up, it is extremely important to highlight the role of perioperative cultural surroundings and the support of the senior staff to nurses regarding their novice scrub learning. As senior scrub staff dictated their educating to novices according to their attitudes.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing and all experiments were carried out in accordance with approved guidelines.

**References**

Nurse Midwives Knowledge Regarding Nursing Management of Post-Partum Hemorrhage at in Iraq

Hanan Noor Mohammad

1Assist. Lecturer, College of Nursing, University of Altoosi, Najaf City, Iraq

Abstract

Aims: Today, it is well-known that postpartum hemorrhage (PPH) is the leading cause of maternal postpartum deaths worldwide; so that this study aims to assess nurses and midwives knowledge.

Method: A descriptive cross-sectional study design was conducted from to meet the previously mentioned objectives. All nurse midwives (n=150) were included who works at the hospital of AL-Najaf AL-Ashraf Province. A constructed questionnaire was prepared and adopted by the researcher to meet the objectives of the study.

Results: The result of the study revealed that the mean overall knowledge score of the study participants for all domains was (1.91) which indicated that the overall knowledge of nurse-midwives in Al- Najaf AL-Ashraf city in Iraq hospitals regarding nursing care of PPH was (fair). The overall knowledge score about prevention of PPH was (1.87) which is also considered (fair). The result of the current study also revealed that there is a significant positive correlation had been found between age, duration of experience in delivery room, training courses or workshops

Conclusion: It was concluded that the nurse-midwives have a moderate level of knowledge about the overall concepts, information and skills related to the PPH. They have weak knowledge about definition, types and common causes of postpartum hemorrhage.

Keywords: Nurse-midwives, knowledge, postpartum hemorrhage, management.

Introduction

Postpartum hemorrhage [PPH] is being designated as the most substantial yet inevitable source of death and maternal illness all over the world [1]. Being the utmost prevailing 5th maternal mortality cause, PPH instigate 140,000 demises each year worldwide [2]. Rendering the WHO, the distinct PPH definition is being stated by way of 500ml minimum blood loss after childbirth within 24 hours. However, the severe PPH is termed as 1000ml least blood loss in 24 hours of birth [3]. Another definition is that PPH the sufficient loss of blood causing hypovolemia, a [10%] decrease in the hematocrit or a situation necessitating the transfusion of blood products irrespective of the delivery route [1]. PPH has been categorized into two types: primary and secondary PPH [1]. Primary [immediate] PPH is typified by a blood loss of more than 500ml owning to vaginal delivery and blood loss of 1500 ml owning to caesarean section within first 24 hrs of delivery [2]. Practically uterine atony is considered to be the root of 70% of immediate PPH. Inadequate contraction of the uterus after a child is born referred to as atony of the uterus. The prevalence of immediate PPH is [5%] of all deliveries[4]. An approximated 14 million cases of PPH are registered every year globally with a [1%] case-fatality rate [5]. According to an assessment, about 2% of the women childbirths are associated to PPH. Although, another approximation indicates the ratio of 25% global maternal deaths while marking the PPH as a widely held prime reason of demise in low wages countries. Economically well developed countries has overall less decease risk than the developing nations. In the high-income countries, the total death risk is approximated to be 1:100,000 deliveries as compared to 1:1000 in low-income countries.[3] According to Rath [2011], a recent WHO analysis showed that in high-income countries,
hemorrhage as a result of PPH accounts for [13.4%] of maternal mortality,[ 30.8%] for Asia, and 34% for Africa[5]. With a broad difference globally, the incidence of minor PPH and severe PPH is estimated to be [6%] and [1.86%] of all deliveries[4,5]. Morbidity resulting from severe PPH is approximated at 4.5-6.7/1000 deliveries with nearly 20 million women globally every year suffering from an acute or chronic disability due to PPH [6-8].

Methodology

2.1 Study aims: The purpose of the current study was to investigate the nurse midwives knowledge regarding nursing care of PPH. The current study also aims to find out the relationship between nurse midwives knowledge regarding nursing care of post-partum hemorrhage with their socio demographic and personal characteristics such as (age, marital status, economic status, educational level, etc…….)

2.2 Design of the study: A descriptive cross-sectional study design was conducted from 30/July/2019 to 29/April/2020 to meet the previously mentioned objectives

2.3 Study Sample: All nurse midwives (n=150) were included who works at the hospital of AL-Najaf AL-Ashraf city in Iraq

2.4 Study instrument: A constructed questionnaire was prepared and modified after a thorough review of the relevant literature. This questionnaire covers two parts:

2.4.1 Part 1: Socio- demographic and personal characteristics: This part included the following (age, level of education, duration of experience in delivery room, receiving training courses or workshop about postpartum hemorrhage, accommodation, type of accommodation, marital status, economic status, others) which included (8) items.

2.4.2 Part 2: Knowledge of nurse midwives about prevention of postpartum hemorrhage which included (18)items.

2.5 Validity and Reliability: The content validity of the instrument was established through a panel of (12) experts, the reliability of the items was based on the internal consistency of the checklist was assessed by calculating Cronbach Alpha which was= 0.765

2.6. Data Collection and Data Analysis: A structured questionnaire used to collect data by direct interview. The approximate interview time of 25-30 minutes was provided for the questionnaire completion. To determine whether the objectives of the study were met, the current study data were analyzed by using SPSS, version 25.

Results and Discussion

Table 1., illustrates the demographic characteristics of the 150 nurse-midwives who participated in this study. Age distribution of the participants revealed that the highest percentage is 67 (44.7%) aged 20 – 29 years. Concerning the level of education, highest percentage is 111/150 (74%) nurse-midwives had secondary school of nurse-midwifery level. Regarding accommodation, findings also revealed that 88 nurse-midwives (58.7%) were living close to the health institution, and 62 (41.3%) were living far from the health institution. For, the type of accommodation, owned documented by 79 (52.7%) nurse-midwives and rented by 71 (47.3%). The enough economic status reported by 20 nurse-midwives (13.3%) enough to some limits in 58 (38.7%) and not enough in 72 nurse-midwives (48%). Out of the 150 nurse-midwives, 119 (79.3%) were married, 24 (16%) were single and 7 nurse-midwives (4.7%) were widowed, divorced or separated.

According to the results of the current study, the research outcomes specified age distribution of the respondents while revealing that the highest age group is between (20 – 29) years which made up (44.7%), secondary was age category (30-39) years which constituted (22%). These data may vary from that gotten by (40) who observed that the highest age group is (47-55) years (32.5%), followed by (20-28) years (24.7%). The results of the present study indicate the target sample; it also indicated that young nurses midwives made up the majority among the other groups.

Regarding the educational level, the majority of the study group (74%) are graduated in secondary school of midwifery, this may be due to secondary school of midwifery are the major levels that qualify health care workers in the range of midwifery, principally in Iraq. One previous study achieved in the city of Maraco found that the majority midwives (35.1%) that were included in the current study graduated from secondary schools (9). In relation to residence, results also explained that 88.0 nurse-midwives (58.7%) are living near the health
Concerning the socio-economic status, most of the research respondents (48%) have not sufficient monthly income. This result can be supported by other results about the accommodation which recorded that (47%) of the midwives have rent accommodation (12).

Regarding to marital status, most of the study sample (79.3%) are married, while (16%) are single and (4.7%) are widowed, divorced or separated as shown in (Table 1).

**Table 1. Demographic Characteristics of the Studied Group**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>(N = 150)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>Less than 20</td>
<td>18</td>
<td>12.0</td>
</tr>
<tr>
<td></td>
<td>20 - 29</td>
<td>67</td>
<td>44.7</td>
</tr>
<tr>
<td></td>
<td>30 - 39</td>
<td>33</td>
<td>22.0</td>
</tr>
<tr>
<td></td>
<td>40 - 49</td>
<td>23</td>
<td>15.3</td>
</tr>
<tr>
<td></td>
<td>50 and above</td>
<td>9</td>
<td>6.0</td>
</tr>
<tr>
<td>Level of Education</td>
<td>Nursing school</td>
<td>12</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>Secondary school of midwifery</td>
<td>111</td>
<td>74.0</td>
</tr>
<tr>
<td></td>
<td>Secondary school of Nursing</td>
<td>17</td>
<td>11.3</td>
</tr>
<tr>
<td></td>
<td>Institute of nursing</td>
<td>8</td>
<td>5.4</td>
</tr>
<tr>
<td></td>
<td>Institute of midwifery</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>College of nursing</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Accommodation</td>
<td>Close to the health institution</td>
<td>88</td>
<td>58.7</td>
</tr>
<tr>
<td></td>
<td>Far from the health institution</td>
<td>62</td>
<td>41.3</td>
</tr>
<tr>
<td>Type of Accommodation</td>
<td>Owned</td>
<td>79</td>
<td>52.7</td>
</tr>
<tr>
<td></td>
<td>Rented</td>
<td>71</td>
<td>47.3</td>
</tr>
<tr>
<td>Economic Status</td>
<td>Enough</td>
<td>20</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td>Enough to some limits</td>
<td>58</td>
<td>38.7</td>
</tr>
<tr>
<td></td>
<td>Not enough</td>
<td>72</td>
<td>48.0</td>
</tr>
</tbody>
</table>

According to the table 2, the distribution of duration of experience in delivery room together with history of training about postpartum hemorrhage was illustrated, where 20 participants (13.3%) had a duration of experience in delivery room for less than one year, 73 (48.7%) had a duration of one to ten years, 31 (20.7%) for 11 – 20 years, 18 (12%) for 21-30 years and 8 nurse-midwives (5.4%) had a duration of experience in delivery room of more than 30 years. Regarding the training about postpartum hemorrhage, 109 nurse-midwives (40%) had received training courses, 90 (33.1%) had participated in workshops and 73 (26.8%) nurse-midwives received other types of training.

Table 3., demonstrated the responses of nurse-midwives about management of PPH; it points that 43.0 respondents (28.7%) had the correct response concerning the assessment of blood loss directly by kidney dish, 72.0 (48%) of respondents have incorrect response and 35.0 (23.3%) they don’t know. The MS was 1.81 and it was a moderate knowledge.

Pads count and weight were correctly identified to be included in the management and assessment of PPH by 65.0 of respondents (43.3%), 44.0 (29.3%) of respondents were incorrect and 41.0 (27.3%) of them did not know. This gave a mean score of 2.14 which is moderate knowledge.
Regarding the responses about recording the vital signs, correct responses reported by 69.0 respondents (46%), incorrect answers by 46.0 (30.7%) and 35.0 (23.3%) did not know with a mean score of 2.15 and it was moderate knowledge. About 36.0 (42%) respondents correctly answered and forty sex (30.7%) incorrectly responded about measurement of pulse and other vital signs every 15 minutes up to stability but 41.0 (27.3%) of respondents do not know. The mean score was 2.11 and it was moderate knowledge. Correct response regarding management of call for help observed by 74.0 respondents (49.3%), incorrect answers were reported by 34.0 (22.7%) and 42.0 (28%) respondents do not know. This gave a mean knowledge score of 2.27 and moderate knowledge. Some other data about this domain are different; Elfaki (2015) observed that nurses-midwives' knowledge about method of assessment of blood loss are (26%), (66.2) and (28.6%) respectively for (pads count and weight), (assess of blood loss directly by kidney dish) and (observe vital signs)(9); while Faiza (2015) found the following correct responses : (77.6%), (53.1%) and (65.5%) respectively for pads count and weight), (assess of blood loss directly by kidney dish) and (observe vital signs)(10).

### Table 2. Distribution of Duration of Experience in Delivery Training about Postpartum Hemorrhage

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of Experience in Delivery Room</td>
<td>&lt;1 year</td>
<td>20</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td>1 - 10</td>
<td>73</td>
<td>48.7</td>
</tr>
<tr>
<td></td>
<td>11 - 20</td>
<td>31</td>
<td>20.7</td>
</tr>
<tr>
<td></td>
<td>21 - 30</td>
<td>18</td>
<td>12.0</td>
</tr>
<tr>
<td></td>
<td>&gt; 30</td>
<td>8</td>
<td>5.3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>150</td>
<td>100.0</td>
</tr>
</tbody>
</table>

| Receiving Training about Postpartum Hemorrhage| Training course | 109 | 40.1 |
|                                               | Workshop       | 90  | 33.1 |
|                                               | Other training | 73  | 26.8 |
| Total                                         |               | 272* | 100.0 |

*Nurse-Midwives Mentioned more than One Choice

Concerning management, good knowledge was gotten by Faiza (2015) for all the questions of the management of PPH. Mohammed et al. (2016) conducted a study in Nigeria showed that about 67.1% of the nurses and midwives have correct answers about using massage as initial step to manage PPH(10); Onasoga et al. (2012) achieved another study in Nigeria observed that 95% of midwives had correctly answered the question about using uterine massage after labor to prevent the development of PPH(11).

### Table 3. Knowledge of Nurse- Midwives about Management of PPH (N =150)

<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>Correct</th>
<th>Incorrect</th>
<th>Don’t know</th>
<th>MS</th>
<th>Assessment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Assess of Blood loss Directly by Kidney Dish</td>
<td>43</td>
<td>28.7%</td>
<td>72</td>
<td>48.0%</td>
<td>35</td>
</tr>
<tr>
<td>2</td>
<td>Pads Count and Weight</td>
<td>65</td>
<td>43.3%</td>
<td>44</td>
<td>29.3%</td>
<td>41</td>
</tr>
<tr>
<td>3</td>
<td>Observe Vital Signs</td>
<td>69</td>
<td>46.0%</td>
<td>46</td>
<td>30.7%</td>
<td>35</td>
</tr>
<tr>
<td>4</td>
<td>Measure the Pulse and other Vital Signs every 15 minutes up to Stability</td>
<td>63</td>
<td>42.0%</td>
<td>46</td>
<td>30.7%</td>
<td>41</td>
</tr>
<tr>
<td>5</td>
<td>Management of Call for Help</td>
<td>74</td>
<td>49.3%</td>
<td>34</td>
<td>22.7%</td>
<td>42</td>
</tr>
</tbody>
</table>
Table 4, shows Spearman’s bivariate correlation analysis. A significant direct (positive) correlation had been found between age of participants and their overall knowledge score ($R = 0.412$, p. value $= 0.004$). Other significant direct (positive) correlation was found with duration of experience in delivery room ($R = 0.575$, P. value $= 0.001$). Moreover, a significant direct (positive) correlation was found with receiving training courses or workshops ($R = 0.243$, P. value $= 0.043$). No significant association had been found between overall knowledge scores and other variables including level of education, accommodation, type of accommodation and economic status, (in all of these variables correlation was not significant, P. value $= .05$).

Unexpectedly, this results did not reveal any significant relationship ($p=0.495$) between overall knowledge of nurse-midwives and their level of education, this result agrees with the result obtained by Onasoga et al. [11]. However, disagrees with the study conducted by Jaber and Abbas (2012) who pointed a significant relationship with educational status [14]; another study found that doctors have better scores than midwives [15]. The unexpected result in the present study may be explained by what is mentioned in this chapter that most of the study sample (74%) are graduated from secondary school of midwifery, so that there is no great difference in the level of education of respondents participated in this study.

Concerning training, the current study found a significant correlation ($p=0.043$) between overall knowledge of nurse-midwives and receiving training courses or workshops, this result agrees with the work obtained by Benedict et al. who found that midwives who completed the training courses named “Essential Steps in the Management of Obstetric Emergencies” ESMOE had better knowledge and performance [15]. However, another study conducted in Baghdad did not find a significant correspondence of about $p>0.05$ amongst the training and inclusive understanding of nurse midwives [14].

<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>Correct</th>
<th>Incorrect</th>
<th>Don’t know</th>
<th>MS</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Try to Control the Bleeding by Massage</td>
<td>61</td>
<td>40.7%</td>
<td>37</td>
<td>24.7%</td>
<td>52</td>
</tr>
<tr>
<td>7</td>
<td>Giving I.V Fluid</td>
<td>84</td>
<td>56.0%</td>
<td>17</td>
<td>11.3%</td>
<td>49</td>
</tr>
<tr>
<td>8</td>
<td>Follow up Continue even Bleeding has Stopped</td>
<td>50</td>
<td>33.3%</td>
<td>41</td>
<td>27.3%</td>
<td>59</td>
</tr>
<tr>
<td>9</td>
<td>Observed Amount of Blood</td>
<td>77</td>
<td>51.3%</td>
<td>9</td>
<td>6.0%</td>
<td>64</td>
</tr>
<tr>
<td>10</td>
<td>Mother Should remain in the labor Room until Become Stable</td>
<td>86</td>
<td>57.3%</td>
<td>11</td>
<td>7.3%</td>
<td>53</td>
</tr>
<tr>
<td>11</td>
<td>Overall Knowledge Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4. Results of Bivariate Spearman’s Correlation Analysis for the Correlation between Overall Knowledge of Nurse-Midwives and Demographic Variables

<table>
<thead>
<tr>
<th>Socio-Demographic Characteristics</th>
<th>Overall mean knowledge score</th>
<th>Spearman’s correlation coefficient</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td></td>
<td>0.412</td>
<td>0.004</td>
</tr>
<tr>
<td>Level of Education</td>
<td></td>
<td>0.056</td>
<td>0.495</td>
</tr>
<tr>
<td>Accommodation</td>
<td></td>
<td>0.044</td>
<td>0.595</td>
</tr>
<tr>
<td>Type of Accommodation</td>
<td></td>
<td>0.028</td>
<td>0.738</td>
</tr>
<tr>
<td>Economic Status</td>
<td></td>
<td>0.145</td>
<td>0.076</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td>0.154</td>
<td>0.060</td>
</tr>
<tr>
<td>Duration of Experience in Delivery Room</td>
<td></td>
<td>0.575</td>
<td>0.001</td>
</tr>
<tr>
<td>Receiving Training Courses or Workshops</td>
<td></td>
<td>0.234</td>
<td>0.043</td>
</tr>
</tbody>
</table>

**Conclusion**

According to the current study, the nurse-midwives have a moderate level of knowledge about the overall information and skills related to the management of PPH. In general, the knowledge of nurse-midwives about PPH increases with age and years of experience.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing and all experiments were carried out in accordance with approved guidelines.

**References**

10. Faiza. A.N . Knowledge and Practice of Nurse


Comparing Parity, Socio-demographic and Serum Vitamin D among Pregnant Women with and Without GDM

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¹Ph.D. Student, Diabetes and Endocrine Center, General Teaching Hospital,  
²Assistant. Prof. Dr. Maternal Neonatr Nursing, College of Nursing, University of Sulaimani

Abstract

Background: Gestational diabetes mellitus can affect pregnancy in short and long term, for both mother and her offspring. Nearly 1% to 28% of all pregnancies are complicated by GDM. Knowing the risk factors can prevent the onset of GDM and early detection of GDM, which is important to prevent or minimize the GDM consequences and optimum treatment.

Objective: To compare the parity, socio-demographic and serum vitamin D state of pregnant women with and without gestational diabetes mellitus.

Method: This is a descriptive analytic study conducted in the Maternity Teaching Hospital in Sulaimani city from December 2018 to January 2019 among 100 pregnant women with GDM and 162 healthy pregnant women. The face-to-face interview was used to collect the information regarding socio-demographic and obstetric history through a specific written questionnaire. At the same time serum vitamin D state was examined using the Roche Elecsys vitamin D₃ assay.

Result: The study found that body mass index, educational state, age at marriage, parity and gravidity significantly higher in the GDM group compare to the non-GDM group. Socioeconomic state does not differ significantly in both group p=0.069.

Keywords: Serum, vitamin D, pregnant, GDM.

Introduction

Gestational diabetes mellitus (GDM) remarkably elevates the risk of later life type two diabetes mellitus¹. GDM is defined as carbohydrate intolerance of varying severity that start or diagnosed during pregnancy. The definition is applicable regardless of whether insulin is used for treatment or the condition persists after pregnancy. GDM is adversely affect the pregnancy outcome not only for the mother, but also it affect fetus, neonate, child adult offspring of diabetic mother². The most frequent complications of pregnancy with diabetes are hyperglycaemia, which increases the risk of pre-eclampsia, premature delivery, and caesarean section. GDM also increases the risk of type two diabetes mellitus in the few years after pregnancy. Women with GDM at higher risk of some chronic diseases such as metabolic syndrome, obesity, cardiovascular morbidities and recurrent GDM in following pregnancy. Also, there are maternal implications secondary to a delivery of a macrosomic or large for gestational age (LGA) fetus, such as an increased rate of cesarean delivery, postpartum hemorrhage (PPH), birth trauma and shoulder dystocia³. The worldwide prevalence of GDM cannot be estimated exactly because of the differences in the diagnostic criteria, race/ethnicity and socio-economic statues of individuals⁴. So, the results of the studies concerning prevalence of the GDM highly variable among countries which ranging from 0.6 to 15%⁵.

The incidence is estimated at 7% worldwide, although the incidence of GDM has increased in the last decades and predicted to increase in future because of the increase in the associated risk factors⁶. The well known risk factors of GDM includes pre-pregnancy body mass index (BMI)³ 30 kg/m², obesity, 35 years and
older at delivery, metabolic syndrome, hypertension, family history of diabetes mellitus or history of GDM, history of unexplained still birth, history of having infant with congenital anomaly, history of macrosomic infant, long term use of steroids, glycosuria, impaired glucose metabolism. A number of the studies found the association between vitamin D deficiency and risk of gestational diabetes mellitus. However, in one large prospective study no association found between vitamin D level and GDM. The huge number of epidemiological studies supports the direct association between serum vitamin D level and insulin responsiveness. Vitamin D deficiency in pregnant women increases risk of gestational diabetes mellitus and pre-eclampsia for mother and increases chance of being small for gestational age for offspring.

The current study tried to compare gravida, para, socio-demographic and serum vitamin D levels of the pregnant women with gestational diabetes mellitus and without gestational diabetes mellitus in Sulaimani City.

Method

Study design and population: This is a descriptive analytic study involving 262 pregnant women, 100 pregnant women with GDM and 162 pregnant women without GDM.

This study was conducted at Gestational Diabetes Center, Maternity Teaching Hospital in Sulaimani city, between December 2018 to January 2019. A non-probability purposive sample was used for selecting study population depending on the inclusion criteria. The inclusion criteria were pregnant women with gestational age more than 24 weeks. The study excludes pregnant women with pre-pregnancy BMI more than 35 and pregnant age more than 40 years old. In the group of GDM, 100 g oral glucose tolerance test (OGTT) was performed to confirm gestational diabetes. Finally, the total of 262 pregnant women recruited in the study. The Ethical Committee of the university of Sulaimani approved this study.

Data Collection: The data collected using questionnaires, by a trained researcher using face-to-face interview. The questions categorized in two parts of socio-demographic history, such as age, blood group, occupation and obstetric history, such as age at marriage, para and gravida. The blood sample was drawn from the participants on the day of the interview and centrifuged at 5000 r/m for 5 minutes, followed by separation of the serum that stored at -80°C in freeze until they defrosted for measurement of serum 25 dehydroxyvitamin D. In this study vitamin D level categorized into three groups of sufficiency (more than 30ng/mL), insufficiency (between 20ng/mL and 30 ng/mL) and deficiency (less than 20ng/mL).

The validity ascertained through a panel; group of 12 experts and reliability calculated by using the correlation coefficient that was \( r = 0.884 \) (statistically adequate). A pilot study applies to groups of 20 pregnant women visiting maternity teaching hospital.

Statistical analysis: the data were analyzed using SPSS version 23.0 software program.

Results

A total of 262 pregnant women recruited in the study. The table 1 shows the demographic characteristics of the pregnant women with and without GDM. In the GDM group majority of samples were at the age between 30 to 39 years old which were 54.0% of the total participants, 41.0% of them were at the age between 20 to 29 years old and the minority of the samples were at the age of 40 and more years which were merely 2.0%. Moreover, the mean and standard deviation of age distribution were 30.10, 4.95 respectively. In non-GDM group majority of samples were in age between 20 to 29 years old which were 54.3% of the total participation; 44.9% of them were aged between 30 to 39 years old and the minority of the total sample was at age of 40 years old and more which were merely 0.61%. Moreover, the mean and standard deviation of age distribution were (28.33, 5.03) respectively.

The table, one shows the obstetric history of the participants with and without GDM. It can be seen in the table that in the GDM group the majority of participants had aged at marriage between 20 to 29 years old which were 65.0% of the total samples. Those who aged at marriage 30 years and over were merely 10.0% of the total samples. However, in non-GDM group majority of samples were in age between 20 to 29 years old which were 54.3% of the total participation; 44.9% of them were aged between 30 to 39 years old and the minority of the total sample was at age of 40 years old and more which were merely 0.61%. Moreover, the mean and standard deviation of age distribution were (28.33, 5.03) respectively.

The table, one shows the obstetric history of the participants with and without GDM. It can be seen in the table that in the GDM group the majority of participants had aged at marriage between 20 to 29 years, which were 65.0% of the total samples. Those who aged at marriage 30 years and over were merely 10.0% of the total samples. However, in non-GDM group majority of participations were getting married between 20 to 29 years, which were 74.7% of the total samples, the minorities of the participants (2.5%) were getting married for 30 years and over.

It is indicated that in GDM group, the majority of the samples (54.0%) of the total participants were in 20 to 29 weeks of gestational age. Moreover, the mean and standard deviation of gestational age equals (29.47, 4.70) respectively. It is indicated in the table that in non-
GDM, 56.2% of the total participation were in 20 to 29 weeks of gestational age and 43.8% of them were in 30 to 39 weeks of gestational age. Moreover, the mean and standard deviation of gestational age equals (29.89, 4.18) respectively.

In the GDM group, 23.0% of the total participations had gravid number one or less and 77.0% of them more than one. Also in non-GDM group, 37.7% of the total participations had gravid number equal to one and 62.3% of them more than one of gravida. The mean and standard deviation were (1.96, 1.06) respectively.

Regarding the number of delivered babied in GDM group, 68.0% of the total participations had a Para one or less and 32.0% of them more than one. In non-GDM group, 85.2% had para number equal to one or less and 14.8% of them had para number more than one.

### Table (1): Obstetric history of pregnant women with and without GDM.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Items</th>
<th>GDM (n=100) Percent</th>
<th>Non-GDM (n=162) Percent</th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at marriage</td>
<td>Less than 20 years</td>
<td>25 (25%)</td>
<td>37(22.8%)</td>
<td>62</td>
<td>0.023</td>
</tr>
<tr>
<td></td>
<td>20- 29 years</td>
<td>65 (65%)</td>
<td>121(74.7%)</td>
<td>186</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30 years and over</td>
<td>10 (10%)</td>
<td>4(2.5%)</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Gestational age</td>
<td>Less than 20 Weeks</td>
<td>3 (3%)</td>
<td>0(0%)</td>
<td>3</td>
<td>0.085</td>
</tr>
<tr>
<td></td>
<td>20- 29 Week</td>
<td>54 (54%)</td>
<td>91(56.2%)</td>
<td>145</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30- 39 Week</td>
<td>43 (43%)</td>
<td>71(43.8%)</td>
<td>114</td>
<td></td>
</tr>
<tr>
<td>Gravida</td>
<td>Equal to one</td>
<td>23 (23%)</td>
<td>61(37.7%)</td>
<td>84</td>
<td>0.014</td>
</tr>
<tr>
<td></td>
<td>More than one</td>
<td>77 (77%)</td>
<td>101(62.3%)</td>
<td>178</td>
<td></td>
</tr>
<tr>
<td>Para</td>
<td>One and less</td>
<td>68 (68%)</td>
<td>138(85.2%)</td>
<td>206</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>More than one</td>
<td>32 (32%)</td>
<td>24(14.8%)</td>
<td>56</td>
<td></td>
</tr>
</tbody>
</table>

Table one compare the association between obstetric characteristics of the both group and significance of the association. The p value was significant at p vale less than 0.05.

### Table (2): Vitamin D status among the study sample

<table>
<thead>
<tr>
<th>Vitamin D Status</th>
<th>GDM (n=100) Percent</th>
<th>Non-GDM (n=162) Percent</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficiency</td>
<td>77.0</td>
<td>68.5</td>
<td>0.463</td>
</tr>
<tr>
<td>Insufficiency</td>
<td>13.0</td>
<td>20.4</td>
<td></td>
</tr>
<tr>
<td>Sufficiency</td>
<td>10.0</td>
<td>11.1</td>
<td></td>
</tr>
</tbody>
</table>

Table two shows the vitamin state of both groups in percent. The p value less than 0.05 were significant.

### Discussion

In a study of the association between blood group and disorders it should be taken to account that the distribution of ABO phenotypes varies across the globe and it depends on racial/ethnic origins and geographical regions. In the current study no association found between blood group and risk of GDM. However, association between maternal blood group and risk of GDM reported by several studies. Blood group AB was found to be significantly (p=0.029) higher in GDM women compared to non-GDM women\(^\text{14}\). This finding in contrast with a recent study from the People’s Republic of China, which was a prospective cohort study Chinese women and demonstrated that women with blood group AB were less likely to have a GDM\(^\text{15}\). Relationship between maternal ABO blood group and risk of pregnancy outcome studied among 55320 singleton pregnant women (16). The study demonstrated that there is no any significant association between ABO blood group and GDM. The results of the studies are
not consensus. Different results regarding the magnitude of associations among these studies might lie on various sample sizes, racial/ethnic origins studied, and population characteristics.

The risk of T2DM and low social economic state has been established in previous studies\(^\text{17}\). The definition of socioeconomic state varies in different regional and countries; however, most of the studies agreed that low socioeconomic state increase the risk of GDM development. The current study found no significant differences between Socio-economic state of GDM and non-GDM group. In the study that carried out in china to demonstrate association between lifestyle factor and risk of GDM development, significant association found between income and risk of GDM. They found that women with lower income at higher risk of GDM compare to high income women\(^\text{18}\). A large population based study from Australia reported that low socioeconomic state inversely associated with the risk of GDM\(^\text{19}\) and no association found in the study which carried out by Janghorbani\(^\text{et al.}\). The finding of another study indicated that higher household income was associated with lower risk of GDM\(^\text{20}\).

Obesity that defined as BMI more than 29 kg/m\(^2\), remains an important and increasing risk factor for GDM. Additionally, this relationship appears to vary by race and ethnicity. The risk of GDM between obese Latina and Asian women is twofold higher than African-American and Caucasian women. The current study found significant differences between BMI of women with GDM and without GDM. The large retrospective cohort study that include 24,325 pregnant women, examined the association between BMI and risk of GDM between different ethnicity and race. The study found higher prevalence of the GDM among groups with high BMIs\(^\text{21}\). A prospective cohort study looked at the effect of maternal BMI on GDM and risk of adverse pregnancy outcome. They reported increased prevalence of GDM with increasing BMI\(^\text{22}\).

The previous studies suggest that the educational level of the mother does not affect the risk of gestational diabetes directly, however, it is more likely to act through more proximal risk factors, so it is called mediators. Several factors considered to be potential mediators in the pathway between maternal education and GDM, for instance. Substance use during pregnancy, such as: alcohol consumption and smoking, nutritional information, stress and pre-pregnancy BMI. The large strong population-based prospective study which carried out among large group of pregnant women from beginning of the study revealed that low educational level is associated with a three times higher risk of developing GDM compared with a high educational level\(^\text{23}\). Significant differences found between the educational state of the pregnant women with GDM and without GDM. In an observational register-based cohort study, the risk factors of GDM studied among 7750 women from the city of Vantaa. The result of the study showed that primiparous women who aged more than 35 years had significantly higher risk of GDM. There were no any significant differences found between vitamin D statususes of the both groups. In both groups of GDM and non-GDM almost 70 percent of the cases had serum vitamin D levels less than 20ng/mL in the numbers of studies it has been proposed that vitamin D deficiency can trigger the onset of diabetes during pregnancy and several mechanisms defined. The studies showed that active form of vitamin D (1,255 (OH)_2D) play a role in stimulation of insulin production and enhance sensitivity to insulin, thus vitamin D deficiency may involved in the development of GDM (25). The two cross-sectional studies showed that serum level of the vitamin D level is lower in GDM women compare to non-GDM women\(^\text{14,8}\).

**Conclusion**

Body mass index, education, residency, age at marriage, parity and Gravidity are the factors that affect the development of GDM. Socio-economic state has not been associated with risk of GDM.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Diabetes and Endocrine Center and all experiments were carried out in accordance with approved guidelines.

**References**


Assessment of the Two-Glutathione S-Transferase Genotypes GSTM1 and GSTT1 Polymorphism Frequencies in Epithelial Ovarian Cancer in Nasiriya Province

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2LECTURER, CANCER RESEARCH UNIT, COLLEGE OF MEDICINE, UNIVERSITY OF THI-QAR, IRAQ

Abstract

The family of glutathione S-transferases (GSTs) is composed of multiple isozymes with significant evidence of functional polymorphic variation. Glutathione S-transferase GSTM1 and GSTT1 are members of the GST family, responsible for metabolism of xenobiotics and carcinogens. Allelic variant of GST gene polymorphisms might impair detoxification function and increase the susceptibility to cancer. The null genetic polymorphism in the gene encoding GST Class µ, GSTM1 and GSTT1, has been reported to be significantly elevated in cancer patient. This study aimed to investigate if these polymorphisms are useful markers for predicting ovarian cancer susceptibility. 30 cases of epithelial ovarian cancer and 30 controls was used to investigate the frequency of GSTT1 and GSTM1 genotypes by using multiplex conventional PCR protocol. The frequency of GSTM1 null allele was significantly elevated (100%, \( P = 0.004 \)) compared with GSTT1 active allele (13% \( P = 0.037 \)). GSTT1 null showed no significant effect in prognosis epithelial ovarian cancer (17%, \( P = 0.551 \)). We conclude that the GSTs might affect in both risk to ovarian cancer.

Keywords: GSTM1, GSTT1 Polymorphism, Epithelial Ovarian Cancer, Nasiriya Province.

Introduction

Ovarian cancer is the main cause of death with gynecological malignancies\(^1\). It is a disease of premenopausal and postmenopausal women; however, no age exempt from ovarian neoplasm. Here is no socio-economic bar for ovarian malignancies but epidemiologically it is more frequent in higher socio-economic and industrially developed countries\(^2\). Risk factor of ovarian carcinoma include inflammation, excessive number of lifetime ovulation, increase in steroid. Hormone levels, infertility, age, asbestos, talk and reproductive factor such as nulli-parity\(^3\). Oxidative stress is due to disturbance in the balance between the production of reactive oxygen species (ROS) and deficiency of antioxidant defense. In other words, oxidative stress results if excessive production of ROS overwhelms the antioxidant system or if there is a significant decrease or lack of antioxidant defense \(^4\). Numerous genetic polymorphism that may be involved in deferential enzyme function or expression, cancer risk\(^5\). Our study postulated that lack of detoxification, which is determined genetically, might be risk factor of ovarian cancer. Glutathione S-transferase (GSTs) are a family of enzymes responsible for the metabolism of xenobiotics and carcinogens. GSTM1, one member of GST family was formerly termed GST1 or GST class “µ”\(^6\). GSTM1 is critical in the detoxification of the oxidative stress product during ovulation\(^7\). Because of detoxification properties of GST enzymes, it is logical to suspect the role of GSTM1-related gene in ovarian cancer patients\(^8\). Glutathione S-transferase theta 1 (GSTT1) is located in long arm of chromosome 22 (22q11.23). Some studies reported that GSTT1 protein was involved in the conjugation of ethylene oxide and halogenated metabolites\(^10\). Glutathione S-transferase catalyze glutathione-mediated reduction of exogenous and endogenous electrophile with broad and overlapping substrate specificity\(^11\). It has been hypnotized GST functional variant associated with less effect detoxification of potential carcinogenesis may confer an increased susceptibility to cancer. Especially in the presence of environmental stress. Such as smoking
and exposure UV radiation\[12\]. Detection variant of null allele exist for GSTT1 and GSTM1 genes and these present biochemically as failure express protein\[13,14\].

Reported studies about the effect of GST polymorphism on risk of ovarian cancer are still few, due to many limitations. GSTT1 and GSTM1 null genotypes was shown to be associated with proper survival and progression free interval in ovarian cancer cases \[15\]. This study has been done because of the lack of genetic studies related to these cases in south of Iraq.

Materials and Method

Subjects: This case-control study was conducted between February 2016 and December 2017. Overall, thirty cases who recruited at Al-Habbobi teaching hospital were histopathological confirmed as epithelial ovarian cancer after surgery. Thirty healthy volunteers were chosen as control. Age ranged from 22 to 39 years in epithelial ovarian group and from 21 to 49 years in control group. Peripheral blood (5 mL) was drawn and collected into tubes containing ethylenediaminetetraacetic acid) EDTA) as an anticoagulant. The collected blood samples were frozen until DNA extraction and then PCR analysis was proceeded. A verbal consent had been taken from the patient and the control volunteer before engagement with the questionnaire.

Genotyping: Genomic DNA was isolated from whole blood as described previously\[16\]. Eight microliter of DNA of each sample was subjected to qualitative assay by 0.8% agarose gel electrophoresis (70V/150Ma for 20 min). The homozygous of GSTT1 and GSTM1 genes were detected by multiplex PCR reaction, using primer set sequences in the table 1. To check successful amplification, albumin gene was used as internal control. The absence of amplified GSTT1 or GSTM1 product (in the existence of the albumin PCR product) indicate the null genotyping for each respectively. Multiplex PCR reaction was proceed in a reaction volume 20µl which contain 5µl of master mix (Kappa, Korea), 1.25 µl of each primer (10 pmol), 3.5µl of genomic DNA. Amplification condition for this multiplex reaction was as follows : (94°C for 3 min, 30 cycles at 94°C for 1 min, 58°C for 1 min and 72°C for 1 min, and final cycle of extension at 72°C for 5 min). 10µl of each PCR product was loaded into 1.8% agarose gel containing ethidium bromide for electrophoresis (70V, 150 mA for 30 min) and visualized at room temperature under UV light.

Epidemiological Analysis: Relative association between studied genotypes and epithelial ovarian cancer risk were evaluated to calculate odd ratio (OR) and 95% confidence intervals (CI).

Results

Genomic DNA, which was extracted from blood leukocytes, was subjected to agarose gel electrophoresis assay as previously described, was illustrated in figure 1. Thirty samples of ovarian cancer and thirty samples of healthy volunteers (as control) genotyped by multiplex PCR assay for detection of GSTT1 and GSTM1 genes. Figure 2 represent multiplex PCR products which was analyzed by 1.8% agarose gel electrophoresis. The GSTT1 active genotype frequency was 43.3% which was significantly different from control (P=0.037, OR 2.75, 95%), whereas the GSTM1 null genotype frequency was 100% for all ovarian cancer cases (P= 0.004, OR 0.02, 95%). GSTT1 null genotype showed no significant effect in risk of epithelial cancer (P = 0.551, OR 1.3, 95), as illustrated in table 1.

Figure 1. Extracted genomic DNA analyzed by 0.8% agarose gel electrophoresis
Figure 2. Detection of GSTT1 and GSTM1 genotypes by multiplex conventional PCR. Arrows indicate the position of 480 bp GSTT1 product and 350 bp AIB1 product. Lane 1 is a 100 bp marker. Lane 2, 3, 5 refer to GSTT1 product, lane 4 was classified as GSTT1 null. All lane exhibit GSTM1 null at 215bp.

Table 1: Null frequency in ovarian cancer

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>(P) value (^a)</th>
<th>OR (95% CI) (^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GSTT1 active</td>
<td>30</td>
<td>13 (43.3%)</td>
<td>0.037</td>
</tr>
<tr>
<td>GSTT1 null</td>
<td>30</td>
<td>17 (56.6%)</td>
<td>0.551</td>
</tr>
<tr>
<td>GSTM1 null</td>
<td>30</td>
<td>30 (100%)</td>
<td>0.004</td>
</tr>
</tbody>
</table>

\(a\). Fisher exact test, \(b\). Odd ratio with 95% confidence interval parentheses.

Other risk factor had been assessed to be considered as non-significant risk factor.

Discussion

This is the first study to investigate the association between GSTT1 and GSTM1 polymorphisms and the epithelial ovarian cancer in Nasiriya city. This study reported that GSTT1 active and GSTM1 null have significant effects in risk of epithelial ovarian cancer. Except the genotype GSTT1 null showed no significant effect of any examined cases. In the past several years, many studies have tried to illustrate the effects of genetic factors in susceptibility and development of ovarian cancer. However, the reported studies about frequencies mutation of previously mentioned genes were mostly not exhaustive\(^{17,18}\). Recently, many studies reported that the polymorphism of GSTs could effect in susceptibility and developing ovarian cancer due to their important role in modification of the biological effects of carcinogens\(^{19,20}\).

Deletion of GSTM1 and GSTT1 genes results in “null” genotype characterized by a general deficit in enzymatic activity\(^{16}\). Individuals homozygous of these deletions are thought to be at increased risk for malignancies as consequence of a decreased capacity to detoxify possible carcinogens\(^{21}\). GSTM1 gene deletion is a good marker for the early detection of many diseases, including, ovarian cancer, endometriosis\(^7\), cystic fibrosis\(^{22}\), bladder\(^{23}\), lung\(^{24}\) and stomach\(^{25}\) cancers. Null phenotype of GSTT1 exhibits decrease in catalytic activity and has been associated with increased risk of cancer of the head, neck and oral cavity\(^{26}\). Patients with GSTM1 null or GSTT1 null showed a better survival rate after chemotherapeutic treatment for the invasive ovarian cancer compared to other patients\(^{27}\).

Otherwise, this study found that the risk of ovarian cancer was increased in carrier of GSTT1-active genotype. This result seemed to be conflict, taking into consideration that several environmental carcinogens found in combustion products and tobacco smoke are among GSTT1 substrates\(^{20}\). However, there is proof that GSTT1 might also be involved in bioactivation, rather than detoxification of several bifunctional alkylating
agents, present in environmental pollution and certain occupational hazards\(^{[28]}\). As a conclusion, bioactive process can yield potent electrophiles that modify DNA and are potentially genotoxic\(^{[29,30]}\). Thus, out result in conformity with the study of Sgambato et al. they showed that \(GSTT1\) null is associated with decreased risk of cancer\(^{[31]}\).

In summary, these results suggest that \(GSTM1\) null and \(GSTT1\) active alleles increase risk to ovarian cancer in Nasiriya population, but further large sample studies need to confirm the genetic role of GSTs in epithelial ovarian cancer.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Obstetrics and gynecology department and all experiments were carried out in accordance with approved guidelines.

**References**


Histological Characteristic that Accompanying with Ovaryfolliculogenisis of Rabbits for Effectiveness Seeds of (Trigonellatibetana)

Hussein Bashar Mahmood, Walaa F Obead, Ghassan A Dawood

Abstract

Objectives: Alternative plants Medicine has been considered one of the world’s most important solutions to female reproductive diseases. The goal of the current study however, was to evaluate the mains histological changes that follow the use of seeds of (Trigonellatibetana) on ovary folliculogenisis.

Method: Twelve’s female healthy rabbits, in animal house all experimental animals have been adapted. For this study, animals were taken distributed into two groups, control administrated by distal water (5 ml/kg b.w) and treatment group was administrated by Trigonellatibetana extract at a dose of 2g/kgb.w/orally administration during 2 week for 3 time daily.

Results: The present study finding the numerous changes happened in the ovary, the mains variance has been noticed increase the numbers of primordial and atretic follicles in treatment group and increase in size of follicles. Moreover, the theca interna was thickness and has a thicker layers of collagen than control group.

Conclusions: Such results indicate that (Trigonellatibetana) was considered to be suitable for early fertility period arrival.

Keywords: Histological, Trigonellatibetana, folliculogenisis, rabbits.

Introduction

Nowadays, in world culture, the term alternate solution Medicine has become very popular, focusing on the concept of using the plants for medicinal purposes. But the present absolutely believe that the only medicines we can trust and use are those which come in capsules or medications. And though most of these tablets and capsules that we take and use come from plants during our everyday lives. Medicinal plants were used as raw materials for the extraction process components that were used in the utilization of various drugs. It includes products from plants, as in the case of sedatives, antibiotics and blood thinners. Moreover the active ingredients of Taxol, vincristine, and morphine isolated from foxglove, periwinkle, yew, and opium poppy, respectively. Medicinal plants are incredibly recognized worldwide as a synthetic anti-inflammatory or considered alternative medicine in the world. In addition there are numerous of plants has been used to treatment of ulcer and acidity in stomach as such as Inhibitor pump H⁺ proton. Herbal medicines have a great future as there are approximately half a million species worldwide and most of them have not yet indicted their medical activities and their medical activities may be crucial in the therapy of current or potential experiments. Trigonell is one of the principal family of herbal medicines. The plant’s effective medicinal part is its seeds which own fertility hormones such as estrogen and progesterone. It is also used for reduce dysmenorrhea occurrence and wound repair, GIT. Furthermore, the administration herbal plants in laboratory animals due to decrease the number of cystic follicles and increase the number of normal follicles. In addition to metabolic modification, there are related changes in the production of reproductive hormones, including the significantly
increased luteinizing hormone (LH) to follicle-stimulating hormone \(^6,7\). Fenugreek conserved good general health, apparently hyperactivity and elevated intake of food, but no major changes in the value in body mass. High doses however significantly decrease the improvement in mature body weight for rats. Fenugreek seeds increase folliculogenesis in mature, perimeter and mature groups but do not affect follicular growth and development likewise, these seeds have estrogen like action \(^8\). Eventually, the medical plants have a great effectiveness to improve of histological characteristics and due to recover disadvantage in organs. The goal of this study to follow the main stages evolve the follicles and arriving to maturate period early.

**Materials and Method**

Twelve healthy female rabbits were chosen and divided in to two groups (control and treatment group). The average weight were [1100-1300] g, breed locally, and were used in this study. Control group [5ml/kg b.w] administrated by distilled Water and treated group have been given mix of (2g) from Trigonellatibetana with 5 ml of distal water after that administration [5 ml/kg b.w] orally during 14 day for 3 time daily \(^9\). Ovary samples were then kept for 72 hours in 10% formalin. Hematoxyline, eosin and Masson’s trichrome stain were used in the samples with routine histological technique: to differentiate tissue components, connective tissue fibers (collagen), fibrin, and muscles\(^{11}\). Themeasuring of theca interna was performed using the average of (4) microscopic fields for each histological section representing 1.13 mm\(^2\) below 10X, selecting (5) histological section . After which end up taking the arithmetic mean in all fields and convert the 1 mm\(^2\) arhythmically\(^{10}\).

**Results and Discussion**

**Histological Features:** The anatomical features for the rabbit ovary were elongated shape, located in pelvic region and pushed slightly to the abdomen cavity. Likewise, the ovary in control rabbit had smooth texture and longer while the ovary in treatment group was rough surface, these result akin with \(^{11}\) in female Rabbit and\(^{12,13}\) in female Hamster who stated that the effect of medicinal plant in anatomical characteristics. While this results contrasting with\(^{14,15}\) in Albino rat which finding different results and considered these medicinal plant not affecting on anatomical features.

Generally, during inspection of all histological sections of ovary observed many variances between two groups: The stroma of ovary in the control group was distinguished by existence a numbers of primordial follicles closed to germinal layer, these follicle were a less number moreover, more follicles in this group were primary and secondary stage and atretic follicles observed rarely (Figure,1). The ovary in treatment group had a large numbers of primordial follicles which, spread a long sheet of germinal layer. On the other hand the ovary of treatment group was distinguished by the presence of large numbers of mature follicles that distributed in all region of stroma (Figure, 2). These results occur as high level sexual hormones as Estrogen and Progesterone this consequences similar with\(^{16}\) who show that trigonellaseeds with relatively normal follicular maturation increase the normal of folliculogenesis. Mature ovaries secrete adequate quantities of oestrogen reinforce by crude trigonella seeds, resulting in significant increases in growing follicles, with increase in total ovarian structures.

The present study was finding the theca interna in normal ovaries have a thin and consist of (3-6) coil around ovarian follicles, thickness about (50 µm) while the theca interna in treatment ovaries became a thick layer about (10-12) coil and thickness about (100 µm). These finding akin with\(^{17}\) which mention that the administrated medical plant in female rats this process lead to increase size of the ovaries structures (Figure, 3,4).

The present study was showing the variance in quantity of collagen fibers through distribution of connective tissue beneath germinal layer and intermingled with theca interna. There are massive amount of collagen fibers in treated ovaries while the control ovaries have less quantity (Fig, 5,6). These result was happing probably for impact increase the follicles size to support Graafian follicles, this finding akin with \(^{18}\)who has reported that the increase in the thickness of theca interna shown in can play a role in steroidogenysis. This is because of ovarian estrogen, is secreted by theca interna,
Figure, 1: Control group showing the stroma of ovary have premordial (black arrow), primary and secondary follicles (yellow arrow). H&E stain. 40X.

Figure, 2: Treatment group showing the ovary have a large number of perimordial follicles (black arrows) and early atretic follicles (yellow arrow) H&E stain. 40X.
Figure, 3: Control group showing the mature follicle surrounded by a thin of theca interna (yellow arrow) with spherical oocyte (black arrow). H&E stain. 100X.

Figure, 4: Treatment group showing the ovary have a thick layer of theca interna (black arrow) H&E stain. 100X.
Figure, 5: Control group showing the amount of connective tissue spread under germinal layer and blood vessels (black arrow). Masson trichrome stain. 100X.

Figure, 6: Treatment group showing the ovary has a large amount of connective tissue intermingled with theca interna (black arrow). Masson trichrome stain. 100X.
Conclusion

Such results indicate that (Trigonellatibetana) was considered to be suitable for early fertility period arrival.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Kerbala and all experiments were carried out in accordance with approved guidelines.

References

Serum Macrophage Migration Inhibitory Factor Levels in Patients with Ischemic Stroke in Iraqi Populations

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Abstract

\textbf{Background:} Stroke is one of the leading causes of permanent disability worldwide. The most common cause of stroke is the occlusion of blood circulation by a thrombus (or embolism) although it can also be produced by the rupture of a vessel and subsequent bleeding in a certain region of the brain. Strokes can, therefore, be classified as ischemic or hemorrhagic.

\textbf{Aim:} The present study was conducted to investigate whether serum MIF levels are associated with severity in patients with ischemic stroke.

\textbf{Method:} A total of 40 patients with ischemic stroke were included in the study who were admitted to hospital from the period between March to August 2019, and other groups consist of 40 apparently healthy individuals. Two blood sample were taken from each patients one during attack (within 24 hours) and the other sample during follow up (within 1-3 months) for serum concentration of MIF by ELISA technique.

\textbf{Results:} Mean serum concentration of MIF in Ischemic stroke during attack (within 24 hours) was significantly higher than that of Ischemic stroke during follow up (within 1-3 months) and healthy control group; 17.094±2.25ng/ml versus 12.83± 4.16ng/ml and 6.407± 3.33ng/ml respectively.

\textbf{Keyword:} Ischemic Stroke, MIF, NIHSS, ELISA.

Introduction

Stroke is one of the leading causes of permanent disability worldwide. The most common cause of stroke is the occlusion of blood circulation by a thrombus (or embolism) although it can also be produced by the rupture of a vessel and subsequent bleeding in a certain region of the brain. Strokes can, therefore, be classified as ischemic or hemorrhagic\textsuperscript{(1)}. Ischemic stroke (IS) accounts for 85\% of overall stroke and its pathophysiology are regulated by a combination of lifestyle, environmental, and unclear genetic risk factors\textsuperscript{(2)}. Ischemic stroke is a heterogeneous multi-factorial, polygenic, complex disease resulting from the combination of vascular, environmental and genetic factors\textsuperscript{(3)}. Ischemic Stroke often causes severe neurological and motor deficits, leading to decreased quality of life; stroke also has significant clinical and socioeconomic impacts\textsuperscript{(4)}. Annually, approximately 800,000 people in the United States have a stroke, and 130,000 die. It has accounted for nearly 5.7 million deaths worldwide, and 87\% of these deaths occur in low and middle-income countries\textsuperscript{(5)}. Numerous studies have focused on the inflammatory reactions after stroke and identifying the roles of important inflammatory signaling molecules, mainly cytokines\textsuperscript{(5)}. Cytokines are up-regulated in the brain after stroke and are expressed not only in immunological cells but also in glial cells and neurons\textsuperscript{(7)}. However, the mechanisms leading to increased release of inflammatory cytokines in patients with stroke remain unclear. Macrophage migration inhibitory factor (MIF) a central cytokine of the innate immunity, includes 114 amino acid with a molecular weight of 12.5-kDa and is expressed in a diversity of cell types, including T cells, macrophages, monocytes, endothelial cells and also in...
activated platelets\(^{(8)}\). Furthermore, it is recognized as a multifunctional cytokine participating in both immune and inflammatory responses\(^{(9)}\). MIF is up-regulated in the brain after cerebral ischemia and is involved in neuro-inflammation\(^{(10)}\). One study demonstrated that serum MIF levels at admission were positively correlated with infarct volume and long-term outcome in patients with acute ischemic stroke (AIS)\(^{(4)}\), while another study confirmed that elevated plasma levels of MIF at admission were associated with increased risk of post-stroke depression (PSD) in the next 3 months\(^{(11)}\).

**Materials and Method**

The current study was carried on 40 patients (18 males, 22 females) age range between 45-85 years from March to August 2019. Other groups consist of 40 apparently healthy individuals (20 male and 20 female) without any history of systemic disease were clinically considered as healthy also included in this study as a control group. We used NIH Stroke Scale to determine the severity of the disease in ischemic stroke patients. We excluded patients with hemorrhagic stroke, stroke associated with surgery, severe trauma or organ ischemia. A six ml of blood samples were collected and withdrawn from each patient within 2 different period including three ml during attack (within 24 hours) and three ml during follow up (within 1-3 months) and three ml from healthy control by vein puncture using disposable syringes under aseptic technique were transferred to sterile Gel tube, and allow to clot at room temperature and centrifuge at 2500 rpm for 10 minutes and the separated serum was saved in Eppendorf tubes and immediately frozen at -20 C till further use to avoid repeated thawing and freezing for MIF ELISA Kit (Elabscience USA) test. This study was in agreement with ethics of Al-Diwaniya Teaching Hospital and verbal informed consent was obtained from all participants.

The National Institutes of Health Stroke Scale, or NIH Stroke Scale (NIHSS) is a tool used by healthcare providers to objectively quantify the impairment caused by a stroke. The NIHSS is composed of 11 items, each of which scores a specific ability between a 0 and 4. For each item, a score of 0 typically indicates normal function in that specific ability, while a higher score is indicative of some level of impairment\(^{(12)}\). The individual scores from each item are summed in order to calculate a patient’s total NIHSS score. The maximum possible score is 42, with the minimum score being a 0\(^{(13)}\).

**Results**

Forty Ischemic stroke (IS) patients included in this study. The risk factors distribution of the study population are summarized in Table (1). There were no significant differences in smoking status as (P>0.05). The prevalence rates of hypertension, diabetes, alcoholism and heart disease were significantly increased in the IS group compared with those in the control group. Mean serum concentration of MIF in Ischemic stroke during attack (within 24 hours) was significantly higher than that of Ischemic stroke during follow up (within 1-3 months) and healthy control group; 17.094±2.25ng/ml versus 12.83± 4.16ng/ml and 6.407± 3.33ng/ml respectively, P-value was (P < 0.0001), figure (1). Table (2) showed highly significant correlation between serum levels of MIF and severity of ischemic stroke (NIHSS) (P<0.001, r=0.512). Where serum levels of MIF increased with increasing severity of ischemic stroke as defined by the NIHSS score.

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Patients (IS)</th>
<th>Healthy Control</th>
<th>OR</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive N(%)</td>
<td>Negative N(%)</td>
<td>Positive N(%)</td>
<td>Negative N(%)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>29 (72.5)</td>
<td>11 (27.5)</td>
<td>16 (40)</td>
<td>24 (60)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>22 (55)</td>
<td>18 (45)</td>
<td>13 (32.5)</td>
<td>27 (67.5)</td>
</tr>
<tr>
<td>Smoking</td>
<td>17 (42.5)</td>
<td>23 (57.5)</td>
<td>15 (37.5)</td>
<td>25 (62.5)</td>
</tr>
<tr>
<td>Alcoholism</td>
<td>8 (20)</td>
<td>32(80)</td>
<td>3 (7.5)</td>
<td>37 (92.5)</td>
</tr>
<tr>
<td>Heart disease</td>
<td>12 (30)</td>
<td>28 (70)</td>
<td>4 (10)</td>
<td>36(90)</td>
</tr>
</tbody>
</table>

* NS : No significant association (P>0.05), S : significant association (P<0.05).
The current study showed that 29 (72.5%) of the patients with ischemic stroke had hypertension, and these results indicate high significantly increased in patients with ischemic stroke compared with those in the healthy control group (P = 0.003, OR = 3.95) table (1). This leads us to believe that hypertension is highly non-diagnosed in population due to the lack of an active non-communicable disease screening program, failure to take routine blood pressure measurements, and a general lack of awareness among health practitioners about hypertension and their complications\(^{(14)}\). The present results are generally in accordance with previous studies where indicated that hypertension reduction being associated with a reduced rate of ischemic stroke\(^{(15)}\). These results consistence with results of Li et al\(^{(4)}\), who found that 91 (62.3%) with hypertension and indicate that hypertension significantly increased in the ischemic stroke group compared with those in the control group. In our results there are 22 (55%) of patients with ischemic stroke had diabetes, and these results indicate

### Discussion

The current study showed that 29 (72.5%) of the patients with ischemic stroke had hypertension, and these results indicate high significantly increased in patients with ischemic stroke compared with those in the healthy control group (P = 0.003, OR = 3.95) table (1). This leads us to believe that hypertension is highly non-diagnosed in population due to the lack of an active non-communicable disease screening program, failure to take routine blood pressure measurements, and a general lack of awareness among health practitioners about hypertension and their complications\(^{(14)}\). The present results are generally in accordance with previous studies where indicated that hypertension reduction being associated with a reduced rate of ischemic stroke\(^{(15)}\). These results consistence with results of Li et al\(^{(4)}\), who found that 91 (62.3%) with hypertension and indicate that hypertension significantly increased in the ischemic stroke group compared with those in the control group. In our results there are 22 (55%) of patients with ischemic stroke had diabetes, and these results indicate
significant correlation between diabetes and ischemic stroke when compared with healthy controls groups (p <0.05, OR=2.53). Diabetes is a recognized independent risk factor for stroke and is associated with higher morbidity and mortality. The physiology underlying the increased risk of ischemic stroke in diabetics may be attributable to the increased prevalence of intracranial stenosis in this population. Vasculopathy induced by chronic diabetes related endothelial damage results in acceleration of atherosclerosis inherent to diabetes. Which in consists in old studies that showed diabetes can commonly causes small infarcts which less likely to lead to a fatal stroke.

Although our results indicate 17(42.5%) from individuals with ischemic stroke are active smokers, but these results shows there is no significant correlation between the active smokers and ischemic stroke when compared with control groups, although the smokers are high in ischemic stroke groups (p > 0.05, OR=1.23) table(1). Although our study indicates non-significant association between the smokers and ischemic stroke when compared with control groups, but remain the smoking as important risk factors for ischemic stroke. The mechanism by which passive smoking can increase the risk of stroke has been reported in many studies. Passive smoking can lead to carotid atherosclerosis, and the levels of homocysteine, fibrinogen, and oxidized low-density lipoprotein cholesterol can also be elevated by smoking. About 8 (20%) of patients with ischemic stroke were alcohol consumption, as table (1), and there is a significant correlation between the ischemic stroke and alcoholism when compared with healthy control group (P= 0.038, OR= 1.6). Ischemic stroke is caused by a number of different pathophysiological mechanisms and alcohol drinking might have contrasting effects on ischemic stroke. For example, moderate and high alcohol consumption is associated with an elevated risk of atrial fibrillation, which is a risk factor for ischemic stroke. The risk for ischemic stroke was significantly higher for binge drinkers than for subjects with no heavy drinking pattern. The present results consistence with that of Xu et al(11), who found that 52 (15.6%) with alcohol consumption.

The frequency of heart disease among the ischemic stroke patients are 12(30%) as in table (3-5), and these results indicate significant association between heart disease and ischemic stroke when compared with healthy control groups (p < 0.05, OR= 3.85). Previous study showed that approximately 10% to 24% of patients with stroke have heart failure. Our study indicate frequency lower than Yalcin et al, which showed (57.5%) of the stroke patients had history of ischemic heart disease, and it may be due to short longevity of our patients after developing ischemic heart attack as compared to others in the developed countries, and short longevity after developing coronary heart disease. Furthermore, increasing evidence that heart disease is independently associated with cognitive impairment exists; and cognitive impairment is associated with decreased survival among hospitalized stroke patients.

Figure (1) showed that mean serum concentration of MIF were highly significantly increased among cases with ischemic stroke during attack (within 24 hours) 17.094± 2.25 ng/ml as compared to apparently healthy controls 6.407± 3.33ng/ml, these results revealed a significant association between the concentration of MIF and the ischemic stroke (P <0.001). A study by Inacio et al(19), (2011), indicated that MIF promotes neuronal death and aggravates neurological deficits after experimental stroke. They found that MIF promoter activity was significantly upregulated by hypoxia during ischemic stroke and that MIF protected neurons against oxygen–glucose deprivation. Thus, the reason why serum MIF levels are increased in ischemic stroke patients remains unknown. Serum MIF levels were found to be decreased with blood-sampling time, with the highest levels of serum MIF at ischemic stroke during attack (within 24 hours) (17.094 ± 2.25 ng/ml), and this levels decrease at cases with ischemic stroke during follow up(within 1-3 months) (12.83± 4.16ng/ml), these difference in serum MIF levels between ischemic stroke during attack (within 24 hours) and ischemic stroke during follow up(within 1-3 months) was statistically significant (P<0.001), figure (1). These results indicate that MIF might play an important role in inflammatory process of central nervous system. However, serum MIF levels were highly significantly elevated in any time of ischemic stroke when compared with the controls (P <0.001). Table (2) showed positive correlation between serum MIF levels and severity of ischemic stroke (NIHSS) (P<0.001, r=0.512, where serum levels of MIF increased with increasing severity of ischemic stroke as defined by the NIHSS score, were highest MIF levels in the severe group (18.229 ± 2.45 ng/ml) as compared to moderate and mild severity (16.891± 3.12 ng/ml and 14.98 ± 4.33 ng/ml respectively). The present results are consistence with results of Xu et al(11), which indicated there was a positive correlation between levels of MIF and the NIHSS (r = 0.248, P<0.001).
Conclusions

Our study demonstrated that the serum level of MIF significantly increased following ischemic stroke. The serum MIF levels at admission were positively correlated with the infarct volumes and the severity of patients with IS. In this study we found increased inflammatory response after ischemic stroke compared with healthy control, represented by increased levels of MIF.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Medical Microbiology and all experiments were carried out in accordance with approved guidelines.

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Serum Levels of Irisin and Vaspin in Diabetic Retinopathy Patients and Their Relation to Patient’s Obesity

Ali Muhye Aldeen Rasheed1, Muayad Khalaf Ibrahim2, Abdulmalek Shallal Ajmi3

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Abstract

The study was carried out in Kirkuk city, from 20th January to September to November 2019 included 40 Diabetic patients with retinopathy and 40 healthy persons within the range of age: 45-75 years of old. The information about patients in this study was retrieved from patient’s itself. The diabetic patients with retinopathy were diagnosed by analysis RBS and HbA1c and fundoscopical examination by the ophthalmologist. The criteria of exclusion include non-diabetic and malignant disease. The results of the patients groups were compared with healthy individuals nearly comparable age and BMI. Four ml of blood were collected from patients and for determination of irisin, vaspin and HbA1c. The study showed that the mean serum level of irisin was significantly elevated in DR patients compared to control group (27.57 ± 4.22 and 17.57 ± 5.9 pg/ml) respectively at a P value < 0.01. This study showed that the mean serum level vaspin was higher in DR patients especially in persons with high BMI and decreased in lower BMI persons (75.1, 59.3 and 48.3 ng/ml) respectively but still higher than healthy ones (P<0.01), as compared with the control group (32.17ng/ml). The study showed that, HbA1c was elevated significantly (P<0.01) in diabetic retinopathy patients (10.17%) compared with healthy control (5.17%),. The study concluded that, vaspin and irisin levels were highly elevate din diabetic patients with retinopathy.

Keywords: Malondialdehyde; Diabetic retinopathy; Oxidative stress; HbA1c.

Introduction

Diabetes mellitus (DM) is expected to affect around 550 million people all over the world according to global estimates of the prevalence of diabetes (1). DM is characterized by constant hyperglycemia that damages various organs and manifests in macro vascular complications like premature atherosclerosis resulting in strokes, peripheral vascular disease, and myocardial infarctions and micro vascular complications such as nephropathy, neuropathy, and retinopathy(2). Diabetic retinopathy (DR) is the number one cause of blindness in people between 27 and 75 years of age. Prevalence of DR is around 25% and 90% at 5 and 20 years, respectively, from diagnosis; it is calculated that 191 million people will be diagnosed with this micro-vascular complication by the year 2030(3). Through the last three decades, extensive scientific reports have shown ROS to play an important role in DM complications such as diabetic neuropathy, nephropathy, and retinopathy due to alterations on the biomechanisms involved in the instauration and progression of micro-vascular complications(4). These three micro-vascular complications share high glucose levels as a starting point; such condition is necessary, but may not be enough to initiate the damage present in the peripheral nervous system (neuropathy), kidneys (nephropathy), and retinas (retinopathy) of diabetic patients(5,6). Hyperglycemic states favor the activation of alternative pathways leading to reactive oxygen species (ROS) formation and augmented concentrations locally and in the rest of the body even at the point of surpassing the antioxidant capacity, a state known as oxidative stress affecting retinal integrity(7,8). The study aim of this work was to evaluate the level of Malondialdehyde (MDA) in diabetic patients with and without retinopathy and healthy controls.

Patients and Method

The study was carried out in Kirkuk city, from 20th January to September to November 2019 included
40 Diabetic patients with retinopathy and 40 healthy persons within the range of age: 45-75 years of old. The information about patients in this study was retrieved from patient’s itself. The diabetic patients with retinopathy were diagnosed by analysis RBS and HbA1c and fundoscopy examination by the ophthalmologist. The criteria of exclusion include non-diabetic and malignant disease. The results of the patients groups were compared with healthy individuals nearly comparable age and BMI.

Four ml of blood were collected from patients and controls in plain tubes without any anticoagulant at room temperature for 10-15 minutes and allowed to clot. The tube then were centrifuged (3000 rpm) for 15min. The clear serum was pipetted into clear dry Eppendorf’s and stored at (-20°C) until used for the various investigations. The levels of malondialdehyde, HbA1c were measured by using immunofluorescence technique.

**Results**

![Bar chart showing the percentage of HbA1c levels in DR and No DM groups.](image)

**Figure 1**: Means of HbA1c levels in the studied groups

In the following Table 1, general characteristics of DR patients:

**Table 1**: Distribution of the general characteristics Diabetes patients

<table>
<thead>
<tr>
<th>Parameters</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI (kg/m²)</td>
<td></td>
</tr>
<tr>
<td>Non-Obese (18.5-24.9)</td>
<td>30</td>
</tr>
<tr>
<td>Overweight (25-29.9)</td>
<td>30</td>
</tr>
<tr>
<td>Obese ≥ 30</td>
<td>40</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
</tr>
<tr>
<td>17-26</td>
<td>12</td>
</tr>
<tr>
<td>27-36</td>
<td>14</td>
</tr>
<tr>
<td>37-46</td>
<td>24</td>
</tr>
<tr>
<td>47-56</td>
<td>25</td>
</tr>
<tr>
<td>57-66</td>
<td>17</td>
</tr>
<tr>
<td>67-76</td>
<td>8</td>
</tr>
<tr>
<td>Mean: 45.01±4.5</td>
<td></td>
</tr>
</tbody>
</table>

As shown in Table 2, the mean serum level of irisin was significantly elevated in DR patients compared to control group (27.57 ± 4.22 and 17.57 ± 5.9 pg/ml) respectively at a P value < 0.01.

**Table 2**: The mean and standard deviation (SD) of irisin level in studied groups

<table>
<thead>
<tr>
<th>Parameters</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>36</td>
</tr>
<tr>
<td>Females</td>
<td>64</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Irisin level (pg/ml)</th>
<th>DR patients</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Mean</td>
<td>27.57</td>
<td>23.98</td>
</tr>
<tr>
<td>SD.</td>
<td>4.22</td>
<td>5.9</td>
</tr>
</tbody>
</table>

P<0.01
This study showed that the mean serum level vaspin was higher in DR patients especially in persons with high BMI and decreased in lower BMI persons (75.1, 59.3 and 48.3 ng/ml) respectively but still higher than healthy ones (P<0.01), as compared with the control group (32.17ng/ml). This result was highly significant at a P value of 0.001, Table 2.

**Table 3: Relation of vaspin with obesity of DM patients**

<table>
<thead>
<tr>
<th>Vaspin level (ng/ml)</th>
<th>DR patients</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>Obese</td>
<td>Overweight</td>
</tr>
<tr>
<td>Mean</td>
<td>75.1</td>
<td>59.3</td>
</tr>
<tr>
<td>SD.</td>
<td>6.8</td>
<td>5.9</td>
</tr>
</tbody>
</table>

The study showed that, HbA1c was elevated significantly (P<0.01) in diabetic retinopathy patients (10.17%) compared with healthy control (5.17%), Figure 1.

**Discussion**

In several studies, women had significantly higher rate of DR than men, as it seems that females may take care about their general health more than males, which is similar to a study in Sweden where women had a higher rate than men (1-3). Esteghamati et al (10) also established that, there was significant relation of irisin and vasoin with occurrence and development of diabetic retinopathy. While Choi et al (11) in recent study reported that the rate of diabetic retinopathy was significantly associated with elevation of vaspin in obese DR patients. In agreement with the current results, Jeong et al (12) indicated a highly significantly increased irisin levels, in cases with respect to controls, point towards a role of free radicals in causation of diabetic complications like retinopathy. In addition, Rickhamet et al (13) showed that, serum irisin has been found to be significantly associated with the severity of DR in patients with type 2 insulin-dependent DM. Taal et al (14) reported that increased vaspin is associated with oxidative stress and poor antioxidant defense, which promotes the progression of DR to its proliferative form. Some other studies speculate that retinal microvascular complications are closely related to the severity of oxidative stress, as expressed as increased level of MDA among DR patients (7,8). Indeed, the exact mechanism by which the oxidative stress contributes to diabetic complications remains unclear, but all biochemical alterations due to DM lead to anatomical and functional impairment in the retinal microvascular network, such as changes in blood flow in the retina, disruption of the blood-retina-barrier and consequently capillary occlusion and ischemia (15). Moreover, El-Mesallamye at al (16) showed that, serum vaspin was significantly higher in DR patients and the lowest mean was in the control group. Al-El-Lebedy et al (17) in their study showed that, HbA1C was elevated significantly in DR group followed by DM patients indicating that poor glycemic control is a strong predictor for the development of DR. Our findings were also consistent with that stated by other studies in the world (17,18). The elevated levels of HbA1c in DR patients may be due to their induction of retinal inflammation and vascular leakage due to their effect on blood vessels which may lead to retinal cell death (7). The positive association between DR and duration of diabetes is noted in the literature. The retinopathy rate in Southern India was 7% in individuals with short duration of diabetes (less than 10 years), 26% in those with 10-14 years duration and 63% in those with 15 years and more duration of diabetes (6). Our findings were also in agreement with the well established statement of several studies denoted that the severity of retinopathy is strongly associated with the duration of diabetes (19,20). Navnet et al (27) showed level OF Vaspin increased as the grade of obesity increased performed a similar study and reported that the concentration of MDA increased with increasing BMI, which was found to be statistically in overweight subjects.

**Conclusions**

The study concluded that, vaspin and irisin levels were highly elevate in diabetic patients with retinopathy.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Medicine and all experiments were carried out in accordance with approved guidelines.

**References**

2. Chang YC, Wu WC. Dyslipidemia and diabetic


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Deleted
Psychological Burden of Caregivers of Children with Cancer at AL-Amal Hospital in Baghdad City

Ahmad Shihab Ahmad

Ph.D. of Community Health Nursing Science/ALZahrawi College University

Abstract

Objectives: To assess psychological burden of caregivers of child with cancer at Al-Amal Hospital in Baghdad City

Method: Descriptive study conducted among 50 caregivers, they are using self-administration method to answer the psychological burden items. The data collection started from October 7th 2019 to March 9th 2020 at Al-Amal Hospital in Baghdad city.

Results: 50% of caregivers had moderate level of psychological burden and 44% had severe level of psychological burden. The grand mean was (2.21) at moderate level of assessment. There is no significant relationship between the caregivers psychological burden and their general information at P-value 0.05.

Conclusion: The care giver had moderate to severe psychological burden due to caring child with cancer. They are need for psychological support.

Keywords: Psychological Burden, Caregivers, Children, Cancer.

Introduction

Cancer is expected to rank as the leading cause of death and the single most important barrier to increasing life expectancy in every country of the world in the 21st century. According to estimates from the World Health Organization (WHO) in 2015, cancer is the first or second leading cause of death before age 70 years in 91 of 172 countries, and it ranks third or fourth in an additional 22 countries.(1) ‘Burden’ may be defined as a multidimensional concept with objective and subjective components. ‘Objective burden’ is defined as specific happenings and activities related to caregiving, for instance, financial problems or personal activity limitations. ‘Subjective burden’, on the other hand, encompasses affective responses to the caregiver experience, such as feelings and emotions related to fear, strain and guilt.(2) Family caregivers (FCs) are a pivotal source for quality of life, well-being and quality of care in terminally ill patients. However, they are also affected by caring for the patient and may thus be affected by significant physical and psychosocial burden. Psychosocial burden and anxiety are associated with the number of unmet needs in FCs of advanced cancer patients. Frequently unmet needs of FCs relate to information on caregiving and care planning, support in managing fear as the patient’s physical or psychological status declines, and preparing for the patient’s death and their own bereavement. Supportive needs can be summarized in four main categories: needs concerning the patient’s well-being, transfer of information, practical problems of caregiving, and emotional support. Some studies suggest that FCs’ needs might be better addressed if specialized palliative care is included during home or hospital care. In addition, FCs’ quality of life has been shown to be higher in patients receiving care in palliative care facilities rather than in acute care hospitals.(3) Cancer is a family experience, and often family members have as many problems coping with it as does the diagnosed patient. The family goes through different stages of adjusting to the disease. The emotional reactions may include anger, resentment, guilt and adjustment pain, and may or may not lead to the acceptance of the disease. The cancer’s diagnosis, as well as the subsequent phases of the disease and its treatment, may be a source of intense stress both for the patient and for the family. Patients and their relatives need to
face the challenge of a life defined with uncertainty; treatment routines, the threat of recurrence or the failure of the treatment.\(^{(4)}\)

Caring for a child with cancer can be profoundly distressing to parents and in turn, parental psychological distress (PD) can affect child and sibling wellbeing. Caring for a child with advanced cancer is likely to be even more distressing, yet very few prospective studies have evaluated parent PD among these families. Understanding the degree of PD and contributing factors among parents with children with advanced cancer has the potential to better enable clinicians to identify higher risk families and optimize outcomes.\(^{(5)}\)

Family caregivers often feel overloaded with the additional obligations and roles they have to pick up. They find it increasingly burdening to care full-time for the household and provide emotional support for the patient. The family’s problems and the way family members regard the disease may be also a result of the family system they are in.\(^{(6)}\)

The role of a family in the course of cancer changes according to the needs of the patient and the cancer’s phase. In the diagnosis phase, depending on the type of family, a big mobilization, with readiness to give support to the patient, is observed. Family members try to get information about the diagnosis, treatment and chances of survival. Other family types may avoid talking about the cancer to avoid creating an additional stress for the patient. Also, very often both the patient and family members try to search for the reasons for the sickness. Looking to find some sense in the universe is a very common tendency, which results from the conviction that everything in the world has its place and reason. Depending on the family’s coping style, if it is a task concentrated family, attitude towards the sickness may promote healthy behavior or strengthen the will of the patient to fight.\(^{(7)}\)

Taking care of a sick patient, most caregivers share some common needs which unfortunately are not always possible to be fulfilled. All of them have a need for information, for feeling close to and needed by the patient, and to have a chance to get external support whereby they can speak about their own problems – to ‘ventilate’ their emotions.\(^{(8)}\)

Method

Descriptive study design was conducted to assess psychological burden of caregivers of child with cancer at Al-Amal Hospital. The data collection started from October 7th 2019 to March 9th 2020 at Al-Amal Hospital in Baghdad city. The study carried among 50 caregivers selected by a non-probability (purposive sample). The study tool was used constructed questionnaire tool psychological burden of care givers of child with cancer. The questionnaire consists of two parts:- Demographic data of sample composed of (5) items that represent the sample demographic data such Age, gender, level of Education, relative to the child and socio economic status and the psychological burden consisted from 14 items constructed to measure the phenomena, rating and scoring according to 3 likert scale answered by 3 key answer always (3), sometimes (2) and never (1), which assessed by cutoff point (0.66) due to scores (1, 2 and 3) respectively. level of assessment: (1-1.66) = low = L, (1.67-2.33) = moderate = M, (2.34-3.00) = severe = S. The data collected after taken the sample agreement to participate in the study and using self-administration method to gathering data. The data analysis by using descriptive and inferential data analysis (SPSS version 20).

Results

Table (1): Distribution of the study sample by their general information

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19-28</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>29-38</td>
<td>14</td>
<td>28</td>
</tr>
<tr>
<td>39-48</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>49 and more</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Variables</td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------</td>
<td>---------</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>28</td>
<td>56</td>
</tr>
<tr>
<td>Male</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read and write</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Primary school graduate</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Elementary school graduate</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>Secondary school graduate</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Diploma and bachelor graduate</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Relative person</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>Mother</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>Sister</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Socio economic status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insufficient</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Barely sufficient</td>
<td>21</td>
<td>42</td>
</tr>
<tr>
<td>Sufficient</td>
<td>19</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

This table shows that 36% of them at age 39-48 years old. 56% of them were females. 36% of them were elementary school graduated. 44% of them were fathers and mothers of children. 42% of them had barely sufficient of socio economic status

### Table (2): Distribution of the psychological burden of caregivers

<table>
<thead>
<tr>
<th>No</th>
<th>Items</th>
<th>Always</th>
<th>Sometimes</th>
<th>Never</th>
<th>Mean</th>
<th>Ass.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>We got insomnia because of our affected child</td>
<td>25</td>
<td>17</td>
<td>8</td>
<td>2.34</td>
<td>S</td>
</tr>
<tr>
<td>2</td>
<td>We feel guilty especially when our child suffers from the disease</td>
<td>30</td>
<td>16</td>
<td>4</td>
<td>2.52</td>
<td>S</td>
</tr>
<tr>
<td>3</td>
<td>We have a desire to cry because of the disease of our affected child</td>
<td>21</td>
<td>17</td>
<td>12</td>
<td>2.18</td>
<td>M</td>
</tr>
<tr>
<td>4</td>
<td>We are scared about the future of our affected child</td>
<td>19</td>
<td>16</td>
<td>15</td>
<td>2.08</td>
<td>M</td>
</tr>
<tr>
<td>5</td>
<td>We are hopeless that our child getting cured</td>
<td>5</td>
<td>13</td>
<td>32</td>
<td>1.46</td>
<td>L</td>
</tr>
<tr>
<td>6</td>
<td>We panic when heard about death of other affected child</td>
<td>11</td>
<td>8</td>
<td>31</td>
<td>1.60</td>
<td>L</td>
</tr>
<tr>
<td>7</td>
<td>We are hesitated from having other children because of the disease</td>
<td>42</td>
<td>8</td>
<td>-</td>
<td>2.84</td>
<td>S</td>
</tr>
<tr>
<td>8</td>
<td>We feel despair of our child because he could not share playing with his mates</td>
<td>20</td>
<td>17</td>
<td>13</td>
<td>2.14</td>
<td>M</td>
</tr>
<tr>
<td>9</td>
<td>We feel incomplete because of the disease</td>
<td>34</td>
<td>10</td>
<td>6</td>
<td>2.56</td>
<td>S</td>
</tr>
<tr>
<td>10</td>
<td>We feel despair of our child because he has to keep away for long times from his mates</td>
<td>20</td>
<td>18</td>
<td>12</td>
<td>2.16</td>
<td>M</td>
</tr>
<tr>
<td>11</td>
<td>We feel pain for his long time of because from school because of his disease</td>
<td>18</td>
<td>15</td>
<td>17</td>
<td>2.02</td>
<td>M</td>
</tr>
<tr>
<td>12</td>
<td>We feel pain because of his growth retardation because of the disease</td>
<td>18</td>
<td>14</td>
<td>18</td>
<td>2.00</td>
<td>M</td>
</tr>
<tr>
<td>13</td>
<td>We feel grief on our affected child because of his deformity of shape by the disease</td>
<td>39</td>
<td>8</td>
<td>3</td>
<td>2.72</td>
<td>S</td>
</tr>
<tr>
<td>14</td>
<td>We feel pain when we see our child not able to eat all types of food</td>
<td>30</td>
<td>11</td>
<td>9</td>
<td>2.42</td>
<td>S</td>
</tr>
</tbody>
</table>

Grand Mean | 2.21 Assessment Moderate

M= mean, Ass.= assessment, level of assessment: (1-1.66) = low = L, (1.67-2.33) = moderate = M, (2.34-3.00) = severe = S
This table shows that when the care givers response to the burden questionnaire, they had moderate psychological burden the grand mean was (2.21) at moderate level of assessment

### Table (3): Caregivers level of psychological burden

<table>
<thead>
<tr>
<th>Level of Burden</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low level (1-1.66)</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Moderate level (1.67-2.33)</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>Severe level (2.34-3)</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

This table shows that 50% of caregivers had moderate level of psychological burden and 44% had severe level of psychological burden

![](image1)

**Figure (1): Psychological burden of caregivers for child with cancer**

### Table (4): Multiple regression of the caregiver burden with their general information

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>2.477</td>
<td>.422</td>
<td>-</td>
<td>5.872</td>
</tr>
<tr>
<td>Age</td>
<td>.026</td>
<td>.052</td>
<td>.076</td>
<td>.503</td>
</tr>
<tr>
<td>Gender</td>
<td>-.171</td>
<td>.152</td>
<td>-.251</td>
<td>-1.127</td>
</tr>
<tr>
<td>Education</td>
<td>-.116</td>
<td>.080</td>
<td>-.321</td>
<td>-1.456</td>
</tr>
<tr>
<td>Relative person</td>
<td>-.116</td>
<td>.080</td>
<td>-.321</td>
<td>-1.456</td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td>-.030</td>
<td>.070</td>
<td>-.065</td>
<td>-.425</td>
</tr>
</tbody>
</table>

Significant level at P ≤ 0.05, (b=beta) Regression Coefficient, (t) test the significant of regression equation, S=significant, HS = high significant, NS= non-significant

There is no significant relationship between the caregivers psychological burden and their general information at P-value 0.05.
Conclusion

Parenting a child with advanced cancer is strongly associated with moderate to severe levels of psychological burden. Interventions aimed at aligning prognostic understanding with concrete care goals, and easing child suffering and financial hardship may mitigate parental psychological burden. Suggestions for further research are presented to support efficient psychosocial interventions and minimize the psychosocial problem experienced by pediatric caregivers over the course of onco-hematological treatments.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the ALZahrawi College University and all experiments were carried out in accordance with approved guidelines.

References

Dietary Supplements as an Object of Civil Legal Relations in Russia

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Abstract

This paper reviews the legal regulation of the dietary supplement turnover in Russia. Since dietary supplements are an independent object of civil commerce, they must have certain qualities that distinguish them, most importantly, from medicines. According to the authors, the dichotomy in the definition of dietary supplements in the Russian legislation does not allow fully preventing dietary supplements from being confused with other food products, medicines, international non-proprietary names of medicines. The authors also examine the relationship of dietary supplements with such concepts as comestibles and food products.

Method: The authors used the method of comparative and systemic analysis, synthesis, and scientific research of the object as an element of civil legal relations.

The purpose of the study was to look at dietary supplements as a subject of civil legal relations, to identify problems of protecting dietary supplements as objects of intellectual property law.

Results: Although since the mid-1990s, active distribution of dietary supplements has begun in Russia, to date, the legal doctrine has not developed the scientific concept of dietary supplements, and the definitions contained in regulatory acts are contradictory. The analysis of the regulatory framework and judicial practice gives reason to conclude that dietary supplements are recognized as objects of civil legal relations in Russia. They are sold in free circulation, they are movable property, and legislators have established mandatory registration for putting these objects into commodity circulation.

Keywords: Object of civil legal relations; dietary supplements; medicines; food products; product life cycle.

Introduction

The history of the development of the legal regulation of dietary supplements (further referred to as DS) in Russia has developed in line with the legal regulation of the entire pharmaceutical market. In the mid-1990s, the country began an active distribution of nutritional supplements, with Herbalife as the largest supplier. In 1991, the Russian legislators adopted law No. 1034-1 “On the sanitary and epidemiological well-being of the population,” of the Russian Soviet Federative Socialist Republic (RSFSR) which was the foundation for the legal regulation of DS production and circulation. However, this was the first step, not entirely successful, to create a legal framework for the DS production and civil commerce.

Currently, Russia is completing the implementation of the Strategy for the Development of the Pharmaceutical
Market of the Russian Federation until 2020. The goal of the strategy was the transition to an innovative model for the development of the pharmaceutical industry of the Russian Federation. This is expected to be achieved through consistent technical and technological re-equipment of enterprises and the release of innovative products, including DS, demanded by the population. As a result, by 2020, the export potential of Russian pharmaceutical products should exceed the figure of 2008 by 8 times. However, not all goals have been achieved, which forces us to carefully study the ongoing processes and draw the right conclusions.

Today, the Federal DS Register of the Federal Service for Surveillance on Consumer Rights Protection and Human Wellbeing (Rospotrebnadzor) lists about 9,500 DS. For example, in 2018 alone, Rospotrebnadzor issued 2,302 certificates of state registration for DS. For many years now, the Evalar company has remained the market leader. The second place is occupied by Pharma-Med. According to data for 9 months of 2018, there were more than 52 thousand facilities in the Russian Federation engaged in the production and commerce of DS, including 180 enterprises engaged in DS production and 52,029 enterprises engaged in DS circulation (including 735 warehouses, 5,569 retail network enterprises, 45,725 pharmacy chain facilities). At the same time, according to the results for 9 months of 2018, the territorial agencies of the Rospotrebnadzor of the Russian Federation had revealed 1997 violations. These figures convincingly demonstrate that the market for the production and distribution of DS in Russia is vast, but there are no clear legal mechanisms for regulating this market.

Violations of the mandatory requirements of the law were identified in 77% of facilities producing DS. During inspections of organizations involved in the implementation of DS (trading enterprises, storage depots, pharmacy chains), violations of the established requirements were found in 47% of the facilities. 2,412 decisions were issued on imposing an administrative penalty in the form of an administrative fine for 17,114.61 thousand rubles. 1,404 DS batches were withdrawn from commerce. The volume of rejected products amounted to 1,133.16 kg.

These figures convincingly demonstrate the need to study DS as the object of legal regulation, and to search for a mechanism for the effective regulation of the DS civil circulation in the Russian Federation.

**Method**

In the research process, we used the following method: comparative and system analysis; scientific research of an object as an element of civil legal relations; synthesis; structural-functional and statistical analysis, as well as the empirical cognition method.

**Results**

Russia is a member of the Codex Alimentarius Commission. Codex Alimentarius is a code of accepted international standards and related texts concerning food products presented in a unified format. First of all, these are accepted international standards, guidelines, norms, and rules. The Codex standards are based on reliable scientific data provided by independent international risk assessment bodies or through special consultations organized by the World Health Organization (WHO).

Although the concept of DS is an integral part of the regulatory framework in the field of sanitary and hygienic regulation, the legal doctrine does not contain a scientifically based concept of DS. Legislators define DS as follows: DS are compositions of natural or identical to natural biologically active substances intended for direct intake with food or incorporation into food products to enrich the diet with individual nutritional supplements from plant-based, animal or mineral raw materials, as well as chemical or biologically active substances and their complexes. It seems to us that this definition lacks the most important thing, namely, the purpose of their application. Should there always be a positive effect on the body when taking DS? The history of Russian pharmaceuticals is full of cases where certain medicines did not have any medical effect, and the health of patients improved only due to the placebo effect.

DS registration takes place at the federal level and the state controls all stages of the DS circulation. A study of the dynamics of the development of legislation shows that it follows a chaotic gradual tightening of the order of the DS circulation, and there are no uniform rules for the civil circulation of DS in Russia. As a result, selling DS makes one balance between legal and illegal activities. The similarity of DS to medicines in many respects has predetermined the complex nature of legal relations regulation in the circulation of DS.

The subjects of civil legal relations enter into relations to satisfy their needs. The objects of civil legal relations are various tangible (including material)
benefits and intangible (ideal) benefits or the process of their creation, which are part of the activities performed by subjects of civil law. DS can have a great impact on human health, not always with positive results. Therefore, the problem of DS turnover is relevant in Russia, as the population’s health leaves much to be desired.

Legislators define DS as an object of the material world. This follows from Article 1 of Federal law No. 29-FZ “On food quality and safety” dated 02.01.2000 which defines DS as natural (or identical to natural) biologically active substances.

According to Paragraph 2.1 of Sanitary Rules and norms (SanPiN) 2.3.2.1290 — 03, DS are used as an additional source of food and biologically active substances, to optimize carbohydrate, fat, protein, vitamin and other types of metabolism in various functional states, to normalize and/or improve the functional state of organs and human body systems, including products that provide a restorative, soft diuretic, tonic, sedative and other types of effect under various functional conditions, to reduce the risk of diseases, as well as to normalize the microflora of the gastrointestinal tract as enterosorbents.

The technical regulation of the Customs Union “On food safety” (TR TS 021/2011) defines DS as natural and (or) identical to natural biologically active substances, as well as probiotic microorganisms intended for consumption with food or incorporation into food products. This inclusion of probiotic microorganisms highlights the inconsistency of the concepts defined by various regulatory enactments.

If we turn to the Guidelines of the Chief Sanitary Doctor of Russia on determining the safety and effectiveness of biologically active nutritional supplements, then we will see another definition of DS as compositions of natural or identical to natural biologically active substances intended for direct intake with food or introduction into food products to enrich the diet with individual DS from plant-based, animal or mineral raw materials, as well as chemical or biologically active substances and their combinations.

Moreover, it is worth noting that legislators introduced DS in two different concepts: as “comestibles” in the law “On the basic norms of state regulation of trade activities in the Russian Federation” and “food products” in the law “On the quality of products”.

According to the law “On trading activities”, comestibles are products in natural or processed form, which are commercially available and used by humans for food (including baby food, diet food), bottled drinking water, alcoholic beverages, beer and beverages made based on it, soft drinks, chewing gum, nutritional supplements and DS. Based on this normative act, one can conclude that DS is a kind of comestible.

According to the law “On food quality”, food products are products in a natural or processed form used by humans for food (including baby food, diet food), bottled drinking water, alcoholic beverages (including beer), soft drinks, chewing gum, as well as food raw materials, nutritional supplements and DS.

Based on the foregoing, we can conclude that the concept of food products includes everything that includes the concept of comestibles, except food raw materials. The term “food raw materials” itself does not have legal significance since it is not used in regulatory acts and judicial practice. Therefore, we can say that in general food products and comestibles constitute almost identical concepts. At the same time, a comparison of DS with food products, in our opinion, violates the balance of interests between the consumer and the manufacturer in favor of the latter. This has been repeatedly indicated in the literature more than once. It seems to us that a DS release on the market should be preceded by an investigation of the positive effect of this particular DS.

The dichotomy in the definition of DS in the Russian legislation does not allow fully protecting DS from being confused with other food products or medicines, including international nonproprietary names of medicines (INPNs).

Let us review the question of the correct legal qualifications and the legal regime of DS as an object of civil rights.

In scientific literature, the ability to serve as an object of property turnover (various transactions) and change its owners (holders) is called turnover ratio. From this point of view, all things are divided into three groups (permitted in circulation, restricted in circulation, and prohibited in circulation or withdrawn from circulation). Most of the things belong to the first group, i.e. permitted in circulation. They can freely move from one person to another as a result of civil transactions, without special permission.
Objects restricted in circulation belong only to certain participants in the turnover. These include ammunition, radioactive substances, etc., or things that are in circulation by special permission of the public authority (for example, currency values, mineral resources, etc.).

The third group of objects withdrawn from circulation consists of things that cannot serve as the subject of transactions and change the owner (Russian Federation or its subjects). These objects, for example, include some land plots that are in federal ownership.

DS are usually classified as objects in free circulation. Legislators do not require a license from legal entities, individual entrepreneurs, and citizens whose activities are associated with the design, construction, reconstruction, operation of organizations for the production of DS, or import and circulation of DS. However, SanPiN2.3.2.1290-03 establishes requirements for the location, arrangement, layout, sanitary condition of organizations involved in the production, import, and circulation of DS, as well as working conditions in their production.

There are requirements for the registration of the new DS. Based on Paragraph 2.8 of SanPiN 2.3.2.1290-03, the launch of new DS, production, and circulation of DS is allowed only after confirmation of their compliance with applicable regulatory documents and technical regulations (registration) in the manner prescribed by applicable law. Paragraph 5, Part 1, Article 24 of TR TS 021/2011 classifies DS as specialized food products subject to state registration. According to Part 6, Article 24 of TR TS 021/2011, the fact of state registration of DS is confirmed by the inclusion of information about it in the Unified Register of Specialized Food Products. Thus, on the one hand, legislators classify DS as things that are free to trade, on the other hand, this trade is placed in a tight framework that restricted it. Nevertheless, DS do not appear in Decree No. 179 “On types of products (works, services) and production waste, the free sale of which is prohibited” of the President of the Russian Federation dated February 22, 1992, therefore they can be distributed in free circulation.

Legislators have also established requirements for the sale of DS. For example, DS can be sold in retail by pharmacy organizations (pharmacies, medicine stores, pharmacy kiosks, and others), specialized stores selling dietary products, food stores (special departments, sections, kiosks) (Paragraph 7.4.1 of SanPiN 2.3.2.1290-03). At the same time, the remote retail sale of DS is not allowed (Letter No. AK/17858/16 “On advertising the remote sale of DS” of the Federal Antimonopoly Service (FAS) of Russia dated 22.03.2016).

Another basis for the classification of objects is their separation into movable and immovable ones. Moreover, the Civil Code of the Russian Federation (CC RF) includes all things not classified by law as real estate in the concept of movable property. Movable property, as a general rule, is not subject to state registration. However, as an exception, legislators may establish the registration of transactions with certain types of movable property (Paragraph 2, Article 164 of the CC RF). Therefore, the fact of registration is not the basis for dividing objects into movable and immovable.

Real estate in Russia includes land, buildings, structures, and all things that are firmly connected with the land, i.e. inseparable from it without disproportionate damage to their economic purpose (immovable by nature). Besides, the CC RF lists aircraft and sea vessels, inland navigation vessels, and space objects as immovable property subject to state registration. As one can see, real estate is a legal category, and state registration of real estate rights is an integral part of the legal regime of real estate, while movable property registration is an exception to the rule.

DS are registered in the prescribed manner. Rospotrebnadzor reveals the compliance of information about the new DS with regulatory documents and the requirements for the quality of DS (Paragraph 2.2 of SanPiN 2.3.2.1290-03). The fact of state registration of DS is confirmed by the inclusion of information about it in the Unified Register of Specialized Food Products. Information from the Unified Register of Specialized Food Products is publicly available.

The procedure for registering a DS consists of several stages: Formation and submission of a registration dossier for the examination of DS at the Scientific Research Institute of Nutrition of the Russian Academy of Medical Sciences (RAMN);

Product testing and examination;

Drawing up an expert opinion;

Submission of documents and their approval in the agencies of Rospotrebnadzor.
Since DS are not medicines, they do not undergo large multi-year international independent clinical trials.

Examination of DS includes the assessment of the accompanying documentation of DS, conducting microbiological, sanitary and chemical studies, studying the toxicological and metabolic effects that may be caused by the use of DS, clinical analysis of the effectiveness of DS and a comprehensive assessment of the results based on the data obtained. Thus, DS, being movable property, undergo serious testing and registration as immovable property, but this does not make them real estate.

The CC RF allows for the registration of rights with movable property. Thus, Article 130 of the CC RF provides for registration on the movable property in cases specified in the law. Paragraph 2, Article 164 of the CC RF establishes state registration of transactions providing for a change in the terms of a registered transaction.

However, in this case, the state registration of DS does not contradict the current legislation of the Russian Federation and it can be assumed that DS, like money and securities, can be attributed to movable property. At the same time, physical properties of objects as a legal regime are not so important for a commodity circulation, namely the ability (impossibility) to make various transactions with these objects, as well as protecting such a regime from possible violations.

The CC RF protects the results of intellectual activities and equivalent means of individualization of legal entities, goods, works, services. The protection of the results of intellectual activity and means of individualization is carried out under the current legislation of the Russian Federation (Paragraph 2, Article 1225 of the CC RF). For the violation of intellectual property protected by law, various types of liability can arise, such as civil liability (Articles 1253, 1301, 1311, 1472, 1515, 1537 of the CC RF); administrative liability (Article 7.12 of the Administrative Code of the Russian Federation (AC RF) “Violation of copyright and related rights, inventive and patent rights”, Article 14.10 of the AC RF “Illegal use of a trademark”) and criminal liability (Article 146 of the Criminal Code of the Russian Federation (CrC RF) “Violation of copyright and related rights”, Article 147 of the CrC RF “Violation of inventive and patent rights”, Article 180 of the CrC RF “Illegal use of a trademark”).

Since DS are allowed to be produced and circulated only after confirmation of their registration (Paragraph 2.8 of SanPiN dated 04.17.2003), the right to name the DS, and the right to labeling or designation of goods start to function from the moment of registration of the corresponding biologically active supplement in the Federal Register of Permissible DS. Such a register will allow all consumers to obtain information about the manufacturer, the scope, and expert opinion based on which the certificate was issued. Until the registration, the means of individualization of the right to the name of the supplement is not of an exclusive legal nature. However, it seems to us that in this case, the right to a name can be protected concerning the rules governing unfair competition.

The legal significance of the DS registration is supported by judicial practice. Thus, the court upheld the conclusion that a trademark in the form of a verbal designation cannot be registered to a similar verbal designation of the name of a DS since in this case the trademark was capable of misleading the consumer regarding the location of the manufacturer of the product, and therefore it violated the provisions of Paragraph 3, Article 1483 of the CC RF. In this case, the applicant had applied with priority on December 28, 2009, for registration of the word “TRIBUSTERON” as a trademark. Rospatent refused to register. The applicant appealed against this refusal to a court. All courts supported the decision of Rospatent on the following grounds: a similar designation is used by a limited liability company based on a certificate of the Rospotrebnadzor dated April 17, 2009, and May 26, 2010, before the priority date of the disputed trademark that the manufacturer wanted to register as a DS name.

Courts, guided by the provisions of Articles 6 and 7 of law No. 3520-1 “On trademarks, service marks and appellations of origin” of the Russian Federation dated September 23, 1992, and Articles 13, 1248, 1483, 1484, 1486 of the CC RF, Paragraph 6 of the Decision of the Plenum of the Supreme Court of the Russian Federation concluded that the designation claimed did not comply with Paragraph 3, Article 1483 of the CC RF.

It is worth noting that the registration of DS in the register protects the right to the name, but DS with a self-registered trademark acquire greater security. Legislators understand a trademark as a designation used to individualize goods, the right to which is certified by a certificate for a trademark (Paragraph 1, Article 1477 of the CC RF). Most manufacturers register verbal, graphic, three-dimensional, and other designations or their combinations as a DS trademark.
It is also worth noting the practice in the Russian Federation of interpreting norms by the Patent Rights Chamber in addition to court interpretations.

In Russian legislation, as well as in the legislation of most foreign countries, the main sign of trademark eligibility is the presence of distinctive character. At the same time, in judicial practice, it is normal to take into account not only the data of the registers allowing to introduce DS into circulation but also the open data contained in these registers. In this case, the basis for refusal of state registration, the relevant authorities indicate Paragraph 3, Article 1483 of the CC RF, where state registration of designations that are an element or contain an element that is false or is capable of misleading the consumer regarding the product or its manufacturer is not allowed. To such designations, legislators refer to designations that generate in the consumer’s mind a false idea of a certain quality of the product, its manufacturer, or place of origin.

The protection capacity of a trademark is limited, as for all means of individualization (for a commercial designation, this is a territorial sphere (Article 1539 of the CC RF), for company names, it is a field of activity (Article 1474 of the CC RF), for trademarks, it is the production of certain groups of goods). In Russia, when registering a trademark, it is necessary to indicate the list of goods according to the International Classification of Goods and Services for the Registration of Marks (hereinafter ICGS). DS belong to Class 5 of ICGS.

Legislators prohibit registration as trademarks of signs that are identical or similar to the point of confusion with the trademarks of others concerning similar goods and having an earlier priority.

It is widely known that legal protection of a trademark as a means of individualization is provided to classes of goods for which state registration of a designation is requested. If a competitor uses a controversial designation for homogeneous goods, the exclusive right to a trademark is subject to protection under the procedure established in the fourth part of the CC. According to the ICGS, DS belong to Class 5. Class 5 of this classification includes pharmaceutical and veterinary medicines; hygiene products for medical purposes; diet food and substances for medical or veterinary purposes, baby food; nutritional supplements for humans and animals; plasters, dressings; materials for dental fillings and manufacturing of dental casts; disinfectants; preparations for the destruction of harmful animals; fungicides, herbicides.

However, even with the inclusion of DS in Class 5 of the ICGS, the law enforcement difficulties are not over. In particular, the question arises about the possibility of applying the registered designation to all types of goods included in one class of ICGS, or about the possibility of equating goods from different classes to DS. On the one hand, the Intellectual property court (IPC) emphasized that in a specific trademark dispute regarding DS, it was necessary to analyze the homogeneity of goods entered into civil commerce by the plaintiff (in a specific case: DS, fruit filler, jelly, ice cream raw materials), products for which trademarks of the defendant had been registered and in respect of which a requirement had been made for the early termination of legal trademark protection (baby food, teas, dietary substances for medical purposes). When establishing the homogeneity of goods, one needs to determine the fundamental possibility of a consumer having the idea that these goods belong to one manufacturer. To establish the homogeneity of the goods, one takes into account the kind (type) of goods, their purpose, the type of material from which they are made, the conditions for the sale of goods, the circle of consumers, and other characteristics. When establishing the homogeneity of goods (services), courts should take into account the following circumstances: the kind (type) of goods (services), their consumer properties and functional purpose (volume and purpose of use), the type of material from which they are made, complementarity or interchangeability of goods (services), conditions for their sale (including the general point of sale, sale through a retail or wholesale network), the circle of consumers, the traditional or predominant way of using goods (services). However, in another case, in its decision, the Chamber of Patent Disputes Board noted that baby food, or wound dressings, or herbicides and fungicides were not pharmaceuticals, and when deciding on the registration of a trademark, it was not necessary to take into account the uniformity of those products.

Another problem of DS safety is the question if DS are homogeneous to medicines or ordinary food products. How closely is homogeneity related to a particular class of ICGS?

The initial jurisprudence focused on the fact that the homogeneity of goods was determined primarily within the framework of one class of ICGS. Therefore, identical trademarks could be registered for various goods
included in various classes of ICGS. Thus, the scope of legal protection depends both on the list of specific goods indicated in the trademark certificate and on the general indication of the class of ICGS. At this stage of the development of the institution of trademarks, the concept of "homogeneity" may cover goods related not to the same, but different classes of ICGS.

In addition to the similarity to the degree of mixing, homogeneity of the goods, the name of the DS should not be similar to the well-known active substance (Paragraph 16, Article 4 of the Federal law “On the circulation of medicines” introduces the concept of the INPN of the medicinal product, i.e. the name of the active substance of the pharmaceutical substances recommended by the WHO). It should be noted that judicial practice supports this legal position. Thus, the Decree of the Presidium of the Supreme Arbitration Court of the Russian Federation indicated that the KARNITON trademark was registered for a wide range of goods, including pharmaceuticals, and we can conclude that the registration of this trademark, which is similar to the degree of confusion with the INPN Carnitine used for medicinal products, leads to misleading the consumer who may think that a non-medicinal product marked with this trademark is a medicine.

DS are often presented in a package quite similar to medicines, with similar release forms and similar instructions for use. They are sold through the pharmacy network, sometimes they have a similar composition of active substances. There are frequent cases where the names of DS are indistinguishable or have significant similarities with the names of medicines (usually substances for medical use). The vast majority of dispute cases are related to the means of individualization of DS introduced into commodity circulation.

Thus, DS are recognized in the Russian Federation as objects of civil legal relations, free in civil commerce. Besides, DS are movable property, but legislators have established mandatory registration for entering these objects into commodity circulation. However, DS names can be mixed with other food products, medicines, INPNs of medicines. In this connection, it is necessary to study the life cycle of DS, to develop additional requirements and rules for the rational choice of DS. The practice of assigning names of medicines followed this practice.

What is the DS life cycle? Without a definition of a life cycle, it is difficult to ensure the safe circulation of DS.

Recently, the phrase “life cycle” is increasingly found both in normative acts and in the scientific literature.

The board and council of the Eurasian Economic Commission define the “product life cycle” as all stages of the product’s life from the initial development, its circulation until the product ceases to exist and also defines the concepts of “equipment and (or) coating life cycle” and other life cycles. The legal concept of “product life cycle” is also contained in other normative acts and is defined as a set of interrelated processes of successive changes in the state of the product from the formation of the initial requirements for the product to the decommissioning of the product, its disposal and (or) dumping.

In the scientific literature, there is currently no single approach to the concept of “life cycle”. The number of stages that a product goes through during its life on the market is also not defined in the doctrine.

Often in normative acts, one can find such terms as “turnover” or “circulation of goods”. Under Article 1 of law No. 29-FZ “On food quality and safety” dated January 2, 2000, the turnover of food products means the sale and purchase (including export and import) and other method of food transfer (sale), its storage, and transportation.

Legislators include the following stages in the process of “medicine circulation”: development, preclinical studies, clinical trials, examination, state registration, standardization, and quality control, production, manufacturing, storage, transportation, import into the Russian Federation, export from the Russian Federation, advertising, delivery, sale, transfer, use, destruction of medicines. As we see, in this context we are talking only about medicines, which do not include DS.

If we analyze the terms used in the Customs Union, then the circulation of food products means buying and selling and other method of transferring food products in the Customs Union (TR TS 021/2011).

Thus, the analysis of the current legislation of Russia shows that there is no unity in the regulatory acts of various levels in the use of the terms “turnover” and “circulation”.

However, for the legal regulation of the circulation of DS, it is important to trace all stages of the life of
DS, not only from the moment of sale. If we turn to common vocabulary, the “cycle” is a process consisting of a succession of various stages over a certain period. For any object, it is important to have a period, starting from birth, functioning, and ending with the cessation of existence. Therefore, under the “life cycle” we mean all the processes from the moment of the development of new DS to their introduction into circulation, the turnover itself, and its termination.

In the absence of a normative act on the life cycle of DS from production to disposal, the provisions of various norms of national standards apply, especially the ones concerning food products.

The norms of SanPiN 2.3.2.1290-03 2.3.2. establish requirements for the composition of DS, the development, registration, production, storage, transportation, labeling, sale, disposal, and supervision. The methodological guideline (MG) norms 2.3.2.721-98 are applied at the stages of examination and registration of DS as well as in the development and putting them into production, industrial production, storage, transportation, procurement, import into the country and sale, in the development of regulatory and technical documentation governing the issues of handling DS.

The quality, safety of DS in food, and their ability to exert the effect declared by the manufacturer are determined by their compliance with hygiene standards established by SanPiN 2.3.2.1078-01. Food raw materials must meet the hygiene requirements of the safety and nutritional value of food products. Here one can give two dozen different regulatory acts regulating the life cycle of DS in Russia as an example.

Based on such an extensive regulatory framework that governs the various stages of the life cycle of DS, we have identified the following: development of new DS, examination, state registration, manufacturing (production), storage, transportation, sale, supervision (control) and disposal. The definition of such stages in the life cycle of DS will allow us to study the legal regulation of DS in general and at a specific life stage of DS.

On January 1, 2019, a new national standard of the Russian Federation was introduced, namely “Specialized food products, biologically active nutritional supplements. Method for the determination of quartzetin” GOST R 57990-201723.

Under GOST R 56202-2014, at the earliest stages of development of DS, a risk assessment must be performed to eliminate or minimize potential risks and implement effective control. According to Article 16 of Federal law No. 29-FZ “On food quality and safety” dated 02.01.2000, developers of new food products are obliged to justify the requirements for the quality and safety of the product, develop programs for production control over the quality and safety of products, establish test method, and shelf life. By GOST R 56202-2014, at the earliest stages of development of DS, a risk assessment must be performed to eliminate or minimize potential risks and implement effective control. Thus, when developing DS, the company conducts scientific and technical activities to obtain scientific and technical products for subsequent implementation.

To develop an original medicine, first one needs to decide what the effect of the DS will be (whether it will improve the functioning of the gastrointestinal tract, promote the functioning of the nervous system, etc.) or find a substance that somehow effectively affects the human body. During the initial screening, options are screened in the laboratory, and the non-effective ones are screened out. It is determined whether the selected substance works. If there are few side effects and the tested substance has a positive effect, then the documentation for the registration of a new DS can be prepared.

It is not allowed to buy or sell DS that:

- do not meet the requirements of regulatory documents;
- have obvious signs of poor quality that do not raise doubts among representatives of agencies exercising state supervision in the field of ensuring the quality and safety of food products (hereinafter referred to as state supervision agencies) when checking such products, materials, and goods;
- do not correspond to the information provided and in respect of which there are reasonable suspicions about their falsification;
- do not have established expiration dates (for food products, materials, and goods, for which the establishment of expiration dates is mandatory) or are past their expiration dates;
do not have labeling containing the information prescribed by law or regulatory documents, or for which there is no such information.

Such DS are recognized as low-quality and dangerous and therefore cannot be sold. They are disposed of or destroyed, withdrawn from circulation by their owner or by order of organizations engaged in state sanitary and epidemiological surveillance, and are also not subject to sale for their intended purpose.

Discussion

1. In international law, in particular, in Decision No. 880 “On the adoption of technical regulations of the Customs Union “On safe food products” of the Commission of the Customs Union dated December 9, 2011, DS are defined as natural and/or identical to natural biologically active substances, as well as probiotic microorganisms intended for consumption at the same time as food or incorporation into food products. This document also contains implicit criteria for classifying substances as DS. In this regard, the doctrinal and (or) legislative consolidation and refinement require a single concept of DS, which includes the mandatory features (criteria) and allows distinguishing between this object (product) and other (medicines, other food products, etc.).

2. Since currently such concepts used in regulatory legal acts as “releasing DS to the market” and “circulation of DS” have different lexical meanings, it is necessary to use a single terminology in regulatory legal acts that would cover both of these concepts. It seems to us that the wording “releasing DS to the market” which is enshrined in Article 6 of the Directive of the European Parliament and the Council of the EU 2001/83/EC of November 6, 2001, deserves attention. The concept “On the Code of the medicines for human use community” covers not only circulation as trade in the market but also other life cycles of DS.

Conclusion

As a result of the study and analysis of the regulatory framework and judicial practice, we can draw the following conclusions:

1. DS are recognized as objects of civil legal relations in Russia. They have free turnover, are movable property, and legislators have established mandatory registration for entering these objects into commodity circulation. Requirements for use in the development and production of DS, their import, storage, transportation, and sale in the Russian Federation are established by SanPin.

2. At present, in Russia, there are no clear criteria to clearly distinguish between DS and medicines. DS are often presented in civilian circulation in packaging quite similar to medicines, with similar release forms, and similar instructions for use. They are sold through the pharmacy network, and sometimes they have a similar composition of active substances. This is the reason for the overwhelming majority of cases of disputes concerning means of individualization of DS introduced into civil commerce.

3. In determining the life cycle of DS, the following stages should be distinguished: the development of new DS, examination, state registration, manufacture (production), storage, transportation, sale, supervision (control), and disposal. The definition of such stages in the life cycle of DS will allow us to study the legal regulation of DS in general and at a specific life stage of DS.

4. To develop a new kind of DS, one first needs to decide what this DS will influence (whether it will improve the functioning of the gastrointestinal tract, promote the functioning of the nervous system, etc.) or find a substance that somehow effectively affects the human body. During the initial screening in the laboratory, it is necessary to look at the non-effective options and find out if the selected substance works. If there are few side effects and a positive effect is present, then such a DS can be registered.

5. Since DS are allowed to production and circulation only after their registration, the right to name DS or the right to labeling or designation of goods arises from the moment of such registration in the Federal Register of Permissible DS. Until the registration, the means of individualization of the right to the name of the supplement is not of an exclusive legal nature. However, in this case, the right to the name may be protected based on the law on the Protection of Competition

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Ethical Clearance: The experimental plan and procedure of the research were approved by the local commission of All-Russian State University of Justice (RLA of the Ministry of Justice of Russia) № 4-II on November 6, 2020.

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Major Adverse Cardiovascular Events in Patients Starting Peritoneal Dialysis Based on the CKD-EPI Versus Thai eGFR Equation: A Retrospective Cohort Study

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Abstract

Background: Major adverse cardiovascular events (MACE) are the leading cause of death in chronic kidney disease (CKD) patients. The relationship between the initiation of peritoneal dialysis (PD) and MACE is unclear.

Objective: This study compared the incidence of MACE in PD patients when the estimated glomerular filtration rate (eGFR) is calculated using the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equation with the Thai eGFR equation.

Method: The study was conducted among 684 end-stage CKD patients in a referral hospital in Thailand between 2011-2018. The first occurrence of cardiovascular events related MACE was defined as dependent variable. Logistic regression was used to identify the relationship.

Results: The incidence of MACE was different between CKD-EPI group (10.9%) and Thai eGFR group (12.4%). After adjusting for other factors, the PD initiation using eGFR calculated by CKD-EPI equation did not affect the incidence of MACE when compared to those from Thai eGFR equation (Ajd.OR: 1.11; 95%CI: 0.68-1.82, P-value = 0.685).

Conclusion: There was no effect on incidence of MACE when PD was initiated based on eGFR calculated using the CKD-EPI equation compared with the Thai eGFR equation.

Keywords: Late stage, end stage kidney disease, PD, CVD, advanced stage, CKD.

Introduction

End-stage renal disease patients are at high risk for major adverse cardiovascular events (MACE). It is the most common cause of death in this group of patients whose illnesses frequently worsen over time as kidney function declines[¹-⁴]. Early accurate detection CKD and monitoring of renal function can reduce MACE...
complications by implementing treatment and lifestyle interventions to help slow the progression of disease, and delay need for renal replacement therapies (RRT). Glomerular filtration rate is the best reflection of kidney function however it is difficult to measure with routine clinical laboratory method. As a result, GFR is estimated based on serum creatinine, and is the measurement nephrologists use to decide when to initiate renal replacement therapy (RRT) for their ESRD patients⁵,⁶. GFR estimates also play an important role in CVD risk screening⁷. The Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI equation, 2009) is the most widely used method to estimate GFR globally⁸. The CKD-EPI equation includes variables related to race and ethnicity. For this reason, many countries have developed new eGFR equations that are based on data from their population⁹-¹³.

Peritoneal dialysis (PD) is one of the RRT options to reduce mortality in ESRD patients. Use of life-extending treatments like RRT should consider both physical and spiritual benefits for patients to maximize the benefit for individual patients and their families. In 2008, the Thai government developed the “PD First” policy for ESRD patients as a strategy to balance the use of clinical resources, treatment outcomes and medical expenditures¹⁴. There are several issues to consider before initiating PD; one of the most important ones is timing. Starting PD can provide significant improvement in symptoms. However, it increases the risk of dialysis related complications. PD requires significant effort on behalf of patients and families and impact quality of life¹⁵. Starting PD before it is necessary can also result in increased costs for the patient and the health care system. The global issue of kidney disease reported the need for more research into the management of CVD risk factors in CKD patients¹⁶,¹⁷. In 2011, the Thai eGFR equation was developed. This was followed in 2015 by the recommendation by the Nephrology Society of Thailand that it be used for the evaluation and management of the adult-CKD patients in Thailand¹⁸, even though it uses an unconventional method compared to the CKD-EPI equation¹⁸,¹⁹. The GFR estimated by Thai eGFR is generally higher than the CKD-EPI-eGFR, there have not been any studies to compare the clinical outcomes of using eGFR calculated by either method to decide when to initiate PD. This study compared the incidence of MACE in patients starting PD based on the eGFR calculated using the Thai eGFR equation with the CKD-EPI equation. MACE is a major complication affecting on high mortality in CKD¹,⁷,²⁰. By using MACE as the clinical outcome of interest, rather than mortality, this study aims to understand the cause of the comorbidity resulting in mortality in ESRD patients.

Materials and Method
Study design and variables: A total of 684 out of 828 ESRD patients from a referral hospital in Thailand between 2011-2018 were included in the study, 144 patients excluded due to MACE that occurred before initiating PD. Participants were divided into two groups based on the results of eGFR recalculated by the CKD-EPI equation and the Thai eGFR equation. The data of each patient were retrieved from the hospital information system which included: gender, age at time PD was started and diabetes mellitus status. Physical examination results of body mass index and blood pressure were obtained. Laboratory results collected were serum creatinine (SCr) during the 3-month period before starting PD, albumin, hemoglobin, bicarbonate and the presence or absence of hypokalemia, defined as a serum potassium level of less than 3.5 mEq/L (3.5 mmol/L. The first CVD-related disease (coronary artery disease, peripheral vascular disease or stroke) that occurred after PD initiation was a dependent variable.

The nephrologists of that hospital used the CKD-EPI eGFR equation to make decisions regarding when to initiate PD. In order to select the equations, a data set for the SCr of a 60-year-old male was generated for eGFR calculation. In the generation process, SCr was varied while gender and age were fixed. The results showed that the eGFR calculated by the Thai eGFR equation was higher than that by CKD-EPI equation (Figure 1). Two groups were then defined: the CKD-EPI equation group which included those with eGFR ranging from 5 to 14 ml/min/1.73m² and the Thai eGFR equation group which included eGFR ≥ 4 ml/min/1.73m² and eGFR < 4 ml/min/1.73m² obtained from CKD-EPI equation.
The formulas used to recalculate the eGFR are displayed in Figure 2. The required parameters (age, gender, and SCr) in the CKD-EPI equation and the Thai eGFR equation were selected. Each participant was allocated to the defined group based on their recalculated eGFR results.

**CKD-EPI equation:**

- $\text{Scr} \leq 0.7$ eGFR = $144 \times \left(\frac{\text{Scr}}{0.7}\right)^{-0.329} \times 0.993^{\text{Age}}$ (Female)
- $\text{Scr} > 0.7$ eGFR = $144 \times \left(\frac{\text{Scr}}{0.7}\right)^{-1.209} \times 0.993^{\text{Age}}$ (Female)
- $\text{Scr} \leq 0.9$ eGFR = $141 \times \left(\frac{\text{Scr}}{0.9}\right)^{-0.411} \times 0.993^{\text{Age}}$ (Male)
- $\text{Scr} > 0.9$ eGFR = $141 \times \left(\frac{\text{Scr}}{0.9}\right)^{-1.209} \times 0.993^{\text{Age}}$ (Male)

**Thai eGFR equation:**

$375.5 \times \text{Scr}^{(-0.848)} \times \text{Age}^{(-0.360)} \times 0.712$ (If female)

**Data Analysis:** Data analysis was performed using StataCorp Stata MP 16.0. We displayed the baseline characteristics of both CKD-EPI eGFR and Thai eGFR equations groups to demonstrate the balance of attributes between the groups using frequency and percent for gender, and presence or absence of diabetes mellitus and hypokalemia. For other continuous variables, mean and standard deviation, median and range (Minimum: Maximum) were used.
Outcome variable was the first occurrence of MACE - coronary arterial disease (CAD), peripheral arterial disease (PAD) or stroke - after starting PD. Univariate analysis was employed to understand the magnitude of the overall MACE alongside each event of CAD, PAD and stroke. Simple logistic regression was performed in bivariate analysis to produce results of association between MACE and each candidate variable. All candidate factors were included in the initial model of multivariable analysis using multiple logistic regression. Each variable was then eliminated from the model. No difference between the models with and without that variable (a result from likelihood ratio test produced a probability of greater than 0.05). The final model presented all factors as crude ORs and adjusted ORs corresponding to their 95% confidence intervals (CI). All hypothesis testing was considered as statistically significant at p-value less than 0.05.

Results

Baseline information of participants: In the 684 end-stage renal disease patients who had not experienced MACE prior to initiating peritoneal dialysis, there was no significant difference between both equation groups except the presence of DM and hypokalemia, which was higher in CKD-EPI group (Table 1).

Table 1: Baseline information of participants with end-stage renal disease presented as number, percent or mean (standard deviation), median (min: max)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>CKD-EPI Group (N=385)</th>
<th>Thai eGFR Group (N=299)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (no (%))</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>209 (54.3)</td>
<td>127 (42.5)</td>
</tr>
<tr>
<td>Female</td>
<td>176 (45.7)</td>
<td>172 (57.5)</td>
</tr>
<tr>
<td>Age at initiated PD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>55.6 (13.6)</td>
<td>55.5 (11.8)</td>
</tr>
<tr>
<td>Median (min: max)</td>
<td>57.0 (18.0:87.0)</td>
<td>56.0 (21.0:79.0)</td>
</tr>
<tr>
<td>Diabetes Mellitus (DM) (no (%))</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>189 (49.1)</td>
<td>165 (55.2)</td>
</tr>
<tr>
<td>Yes</td>
<td>196 (50.9)</td>
<td>134 (44.8)</td>
</tr>
<tr>
<td>BMI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>22.5 (3.6)</td>
<td>23.4 (3.8)</td>
</tr>
<tr>
<td>Median (min: max)</td>
<td>22.1 (14.2:33.6)</td>
<td>23.1 (14.2:35.6)</td>
</tr>
<tr>
<td>Systolic Blood Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>143.1 (22.8)</td>
<td>143.6 (22.3)</td>
</tr>
<tr>
<td>Median (min: max)</td>
<td>141.0 (85.0:199.0)</td>
<td>145.0 (84.0:198.0)</td>
</tr>
<tr>
<td>Diastolic Blood Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>77.8 (12.5)</td>
<td>78.6 (11.8)</td>
</tr>
<tr>
<td>Median (min: max)</td>
<td>78.0 (50.0:100.0)</td>
<td>80.0 (50.0:100.0)</td>
</tr>
<tr>
<td>Albumin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>3.4 (0.6)</td>
<td>3.4 (0.6)</td>
</tr>
<tr>
<td>Median (min: max)</td>
<td>3.4 (1.7:5.0)</td>
<td>3.4 (1.6:4.9)</td>
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<tr>
<td>Hemoglobin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>8.2 (1.4)</td>
<td>8.9 (1.4)</td>
</tr>
<tr>
<td>Median (min: max)</td>
<td>8.1 (3.9:13.1)</td>
<td>7.8 (3.9:14.5)</td>
</tr>
</tbody>
</table>
Characteristics | CKD-EPI Group (N=385) | Thai eGFR Group (N=299)
---|---|---
Bicarbonate (HCO3) | | |
Mean (SD) | 24.9 (4.5) | 23.8 (5.4) |
Median (min: max) | 25.0 (10.0:40.5) | 24.0 (4.0:42.5) |
Hypokalemia (no (%)) | | |
No | 324 (84.2) | 264 (88.3) |
Yes | 61 (15.8) | 35 (11.7) |

**Incidence of major adverse cardiovascular events:** Incidence of MACE in the CKD-EPI group was 10.9% compared with 12.4% in the Thai eGFR group (Table 2). Coronary artery disease was most common MACE diagnosis followed by stroke.

**Table 2 Incidence of the first major adverse cardiovascular events presented as number and percent**

<table>
<thead>
<tr>
<th>Main factor</th>
<th>CKD-EPI Group</th>
<th>Thai eGFR Group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
</tr>
<tr>
<td>MACE (Yes/No)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>343</td>
<td>89.1</td>
<td>262</td>
</tr>
<tr>
<td>Yes</td>
<td>42</td>
<td>10.9</td>
<td>37</td>
</tr>
<tr>
<td>MACE (Subgroup)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No MACE</td>
<td>343</td>
<td>89.1</td>
<td>262</td>
</tr>
<tr>
<td>CAD</td>
<td>29</td>
<td>7.5</td>
<td>23</td>
</tr>
<tr>
<td>PAD</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
</tr>
<tr>
<td>Stroke</td>
<td>13</td>
<td>3.4</td>
<td>13</td>
</tr>
</tbody>
</table>

MACE major adverse cardiovascular event; CAD coronary arterial disease; PAD peripheral arterial disease

**Relationship between different eGFR levels and major adverse cardiovascular events:** Using the 684 observations in the fitting model, the different equations did not have a statistically significant effect on MACE occurrence. A MACE event (CAD, PAD or stroke) was 1.11 times more likely to occur after PD initiation in the Thai eGFR group than EPI-CKD group.

**Table 3: Association between CKD-EPI equation compared with Thai eGFR with cardiovascular disease among patients with end-stage renal disease**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number</th>
<th>% CVD</th>
<th>Crude OR</th>
<th>Adj. OR</th>
<th>95% CI</th>
<th>P-Value</th>
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</tr>
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</tbody>
</table>

Age refers to age at initiated PD; DM refers to diabetes mellitus; BMI refers to body mass index

**Discussion**

This study aims to compare the incidence of MACE among 684 PD patients from a large provincial hospital based on eGFR recalculated by the CKD-EPI equation and Thai eGFR equation using serum creatinine and other data obtained 3 months prior to initiation PD. No significantly difference in the incidence of MACE was found when comparing the CKD-EPI equation group and the Thai equation in calculating eGFR (adj.OR: 1.11; 95%CI: 0.68-1.82; P-value = 0.685).

Patients in the Thai eGFR group (recalculated eGFR $\geq 4$ ml/min/1.73m² using the Thai eGFR and eGFR<4 ml/min/1.73m² using the CKD-EPI) appear to be at greater risk of MACE than those in the CKD-EPI group (recalculated eGFR 5 to 14 ml/min/1.73m² using CKD-EPI equation). The percentage of patients with diabetes and hypokalemia was higher in the Thai eGFR group. Diabetes is a known risk factor for MACE as well as hypokalemia. Coronary artery disease and stroke were also found to be higher in Thai eGFR group. However, these differences are minor and not statistically significant (P-value = 0.685) in a multivariable analysis that adjusted for age at PD initiation, DM, hypokalemia, and other variables.

A study from Japan compared two equations between the coefficient-modified CKD-EPI equation and their own developed GFR-estimating equation (JPN-eGFR) on CVD events, suggested that CKDEPI-eGFR was more likely to detect some CVD event (cardiac disease or stroke, or both) other than kidney dysfunction when compared with JPN-eGFR. Stroke is one of consequence of malfunctional kidney supported by Kimoto et al., demonstrated that kidney dysfunction related to elevated arterial, particularly aorta, stiffness in type-2 DM patients. In this study, the CKD-EPI and Thai eGFR estimating equation are both based on serum creatinine (Scr) which varies based on the ability of the kidney to excrete waste products, muscle mass, age, and gender. The Thai eGFR equation does not account for all parameters related to the fluctuation of Scr compared with the CKD-EPI equation. People are more likely to lose muscle mass with the increasing age or ill health, especially if they have ESRD. Therefore, they are more likely to have a lower GFR estimation. It is noteworthy thatCKD-EPI estimates GFR was based on specific Scr according to male or female, this brings eGFR lower than Thai eGFR. Hence, gaining high eGFR in the Thai eGFR seems not have significant different effect on MACE in Thai ESRD patients compared with CKD-EPI calculation.

The strengths of this study include the large number of ESRD patients on PD who have not experienced any MACE prior to PD initiation and completeness of the variables strongly associated with MACE. Another strength is that the data come from a large provincial hospital with one of the largest populations of chronic kidney disease in Thailand, and therefore is a large sample representative of the diversity of patients in a lower level of health care facilities. This article also focuses on a
major complication (MACE) which is a more practical outcome in the evaluation and management of the adult-CKD patients than overall mortality and can avoid “lead time bias” in clinical care. In developing the algorithm concerning the classification of both equations, we allocated recalculated eGFR by covering both early and late PD start according to the IDEAL Study definition (Figure 1), however, decision to start PD is recommended based on a careful discussion with the patient of the risks and benefits of the treatment, considering patient’s symptoms and signs of renal failure in addition to the eGFR[23].

**Conclusion**

There was no effect on major adverse cardiovascular events (MACE) either using CKD-EPI eGFR estimating equation or the Thai eGFR equation to initiate peritoneal dialysis. Nephrologists can consider using the Thai eGFR as comparable as the CKD-EPI, while considering the patient’s clinical symptoms and patient opinion as part of the decision making.

**Ethical Considerations:** Ethical approval was obtained from the Ethics Committee of KhonKaen University (reference number HE622214) and use of the data was approved by the administrative board of the study hospital (EC number: 22/62).

**Acknowledgement:** The authors acknowledge the support from the administrative committees of Chaiyaphum Hospital for providing data for the analysis.

**Conflict of Interest:** No conflicts of interest were disclosed.

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**References**


Comparison of All-cause Mortality and Technique Failure Between Early-late and Very Late Start Peritoneal Dialysis: A Retrospective Cohort Study

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Abstract

Background: Glomerular filtration rate (GFR) is the gold standard for the detection and monitoring of chronic kidney disease (CKD). Controversy is remaining in the timing of peritoneal dialysis (PD).

Objective: This study compared all-cause mortality and technique failure between early-late and very late start PD in stage-5 CKD patients.

Method: A cohort of 828 stage-5 CKD patients from a tertiary hospital was reviewed and analyzed. Patients were categorized into groups of early-late or very late start PD according to their estimated-GFRs. The outcomes were all-cause mortality and technique failure. Survival analysis was performed.

Results: Median time to all-cause mortality was 35 months in early-late group, 40 months in very late group, while technique failure was found identical in both groups (25 months). There were no statistically significant association in cox regression models.

Conclusion: No clinical benefits were found by starting dialysis based on eGFR at the timing of PD (early or very late start PD plan). Asymptomatic patients with stage-5 CKD may be safely managed by very late start PD plan and patients may benefit from the delayed PD initiation.

Keywords: End-stage renal disease, end-stage kidney disease, delayed PD, formula, equation.

Introduction

Chronic kidney disease (CKD) patients often remain asymptomatic until the late stages of disease when the loss of renal function has already reached 90%[1]. Glomerular filtration rate (GFR) is considered the best clinical parameter to determine renal function but is not useful in clinical practices because it cannot be measured directly in an individual[2-4]. As a result, clinicians often use serum creatinine to diagnose and monitor renal disease. However, serum creatinine varies with age and muscle mass making it imperfect for determining renal function[5-9]. Current clinical practice guidelines recommend using eGFR to detect early kidney damage[3], diagnose chronic kidney disease...
(CKD), monitor renal function\cite{43} and guide decision making about initiation of dialysis \cite{3}. The decision to initiate dialysis requires consideration of multiple factors, including clinical symptoms, eGFR, rate of decline of eGFR, and patient preferences. The IDEAL study conducted in 2009 found early vs. delayed dialysis initiation made no difference in mortality \cite{10}. Several guidelines recommend considering renal replacement therapy (RRT) when patients reach CKD stage-5 or eGFR <15 ml/min/1.73m\(^2\)\cite{11,12}, and vary from country to country. Patients in Taiwan (5 ml/min/1.73m\(^2\)) and New Zealand (6.4 ml/min/1.73m\(^2\)) have a mean pre-dialysis eGFR level in the lower end of the spectrum, when compared with Australia (7.3 ml/min/1.73m\(^2\)), the United Kingdom (8.5 ml/min/1.73m\(^2\)) and the United States (11 ml/min/1.73m\(^2\))\cite{13}. A systematic review reported the average GFR when starting dialysis in several East Asian countries including Hong Kong (9.1 ml/min/1.73m\(^2\)), Korea (7.8 – 8.2 ml/min/1.73m\(^2\)) and Japan (5.0 ml/min/1.73m\(^2\))\cite{14}. While eGFR is very helpful in monitoring rate of decline in renal function and can provide parameters for decision making, clinical symptoms play a significant role in the initiation of RRT. Initiation of dialysis also occurs urgently when patients develop life threatening congestive heart failure which cannot be corrected with other therapeutic interventions. Monitoring the eGFR plays a key role in guiding nephrologists so they can plan and avoid emergent dialysis, or worse yet, a fatal event.

Despite yielding different results from eGFR calculation along with several formulae, treatment decisions based on CKD stage and eGFR such as the initiation of dialysis and other treatments are impacted. In the absence of clinical situations requiring dialysis, asymptomatic patients may experience a decrease in quality of life, and risk of complications due to the premature initiation of dialysis. It can also result in unnecessary health care expenditures. Therefore, this study intended to compare all-cause mortality and technique failure between early-late and very late start PD in stage-5 CKD patients.

Materials and Method

Study Design: This was a retrospective cohort study utilizing data from the hospital information system of a tertiary hospital in the Northeast Thailand. There were 996 CKD patients who underwent PD at the hospital from 2011 to 2018. All patients at least 15 years old with stage-5 CKD, were included regardless of gender. Patients with incomplete data required for analysis were excluded, resulting in a total of 828 study participants (Figure 1).

**Dependent Variables:** The primary outcome variable was all-cause mortality, including patients who died after switching from peritoneal to hemodialysis. The secondary dependent variable was the composite outcome of technique failure which comprised of discontinuation of dialysis, change from PD to hemodialysis, kidney transplantation and death. Patient survival rates were calculated from the date of initiation of continuous PD until the date of death or up to 31 December 2018. Time from initiation of PD until technique failure was calculated from the date of commencing PD until the first date change to hemodialysis, kidney transplantation or death, or up to 31 December 2018.

**Independent Variables:** The following information was collected for each patient at the time PD was initiated: age, gender, body mass index, blood pressure, diagnosis of diabetes or cardiovascular disease (CVD). Laboratory results including albumin (g/dL); hemoglobin (g/dL); bicarbonate (mmol/L) and hypokalemia (yes/no), were also collected.

**Definition of Comparing Groups:** The early-late group and the very late group were defined by a well-known randomized, controlled trial of early versus late initiation of dialysis \cite{10}, the range of eGFR for PD initiation plan was explained as eGFR = 10.0 to 14.0 ml/min/1.73m\(^2\) (early start), eGFR = 5.0 to 7.0 ml/min/1.73m\(^2\) (late start). Therefore, we set the eGFR 5.0 ml/min/1.73m\(^2\) as a cut-of-point to divide group, patients who had eGFR 3-month before starting PD > 5 ml/min/1.73m\(^2\) were included in the early-late group, while those who had eGFR < 5 ml/min/1.73m\(^2\) were assigned in the very late group. All eGFR were calculated by CKD-EPI formula in the hospital.

**Statistical Analysis:** Categorical variables were reported as number and percentage. Mean and standard deviation, median and range (Minimum: Maximum) were used to describe continuous variables.

To answer the research question, all-cause mortality and technique failure were considered individually. Time to events were reported as incidence density rate of events in 100 per patient-month. Survival probability was presented using Kaplan Meier method comparing both groups. Test of equality was employed using log-rank test.
A Cox proportional hazard model was performed to estimate the effect of the start PD on each outcome variable adjusting for gender, age, DM, hypertension, CVD, BMI, blood pressure, albumin, bicarbonate and hypokalemia. Hazard ratios (HR) with their 95% confidence interval (CI) were reported. Data analysis was performed using StataCorp Stata MP 16. All statistical tests considered a probability of 0.05 as statistically significant level.

**Results**

**Baseline Characteristics of the stage-5 CKD patients**: The demographic information, health and disease conditions of the stage-5 CKD patients were presented in Table 1.

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<thead>
<tr>
<th>Characteristics</th>
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<tr>
<td></td>
<td>Early-late (n = 484)</td>
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<td>231 (47.7)</td>
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<tr>
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Initiated PD Group

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<tr>
<td>Median (min: max)</td>
<td>7.0 (5.0:14.0)</td>
<td>3.0 (1.0:4.0)</td>
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Incidence rates of all-cause mortality and technique failure

**All-cause mortality rate:** Of the 828 patients revealed the overall mortality rate as 1.9/100 patients per month (95% CI: 1.7-2.1) (Figure 1). Patients with DM had highest mortality rate. Patients at early-late start PD was slightly higher mortality rate (2/100 patient-month (95%CI: 1.8-2.3)) than those beginning PD at very late (1.7/100 patient-month (95%CI: 1.4-2)).

**Technique survival rate:** Patients in early-late group had similar rate of technique failure 2.8/100 patient-month (95%CI: 2.5-3.2) compared to those in very late group, 2.7/100 patient-month (95%CI: 2.4-3.1) (Figure 2). Technique failure rates were higher in diabetic patients and in patients with CVD. While the overall technique failure rate demonstrated somewhat difference from other attributes (2.8/100 patients per month; 95%CI: 2.6-3.0).
Survival probability of all-cause mortality and technique failure: Kaplan-Meier survival curves of all-cause mortality demonstrated a slightly lower median survival time (35 months) in early-late group than that in very late group (40 months) (Figure 3). The median time to technique failure in both groups were similar (25 months). The log rank test of the two curves were not statistically significant different.
Association between two equations on all-cause mortality and technique failure: There were no statistically significant association between two groups for outcome variables (Table 2). Adjusted HRs of both all-cause mortality and technique failure were 0.92 (95%CI: 0.74-1.14, P-value = 0.45) and 1.01 (95%CI:0.84-1.23, P-value = 0.88), respectively. The analysis also demonstrated that low albumin level, diabetes were risk factors for death and technique failure.

### Table 2 Association between two equations on all-cause mortality and technique failure

| Characteristics | All-cause mortality | | | Technique failure | | |
|-----------------|---------------------|----------------|----------------|----------------|----------------|
|                 | Crude HR            | Adj.HR** (95%CI) | P             | Crude HR       | Adj.HR** (95%CI) | P             |
| **Group**       |                     |                 |               |                 |                 |               |
| Early-late      | 1                    | 1               |               | 1               | 1               |               |
| Very late       | 0.86                 | 0.92(0.74-1.14) | 0.45          | 0.96            | 1.01(0.84-1.23) | 0.88          |
| **Gender**      |                     |                 |               |                 |                 |               |
| Male            | 1                    | 1               |               | 1               | 1               |               |
| Female          | 0.90                 | 0.87(0.70-1.07) | 0.17          | 0.90            | 0.83(0.69-1.00) | 0.05          |
| **Age (years)** |                     |                 |               |                 |                 |               |
| 1.0             | 1.02(1.01-1.03)      | <0.01           | 1.01          | 1.00(0.99-1.01) | 0.87          |
| **DM**          |                     |                 |               |                 |                 |               |
| No              | 1                    | 1               |               | 1               | 1               |               |
| Yes             | 1.64                 | 1.41(1.12-1.76) | <0.01         | 1.37            | 1.22(0.99-1.49) | 0.06          |
| **CVD**         |                     |                 |               |                 |                 |               |
| No              | 1                    | 1               |               | 1               | 1               |               |
| Yes             | 1.10                 | 0.85(0.65-1.10) | 0.22          | 1.17            | 1.04(0.82-1.31) | 0.76          |
| **BMI (kg/m²)** |                     |                 |               |                 |                 |               |
| 1.00            | 0.98(0.95-1.10)      | 0.18            | 1.01          | 1.00(0.97-1.02) | 0.84          |
| **SBP (mmHg)**  |                     |                 |               |                 |                 |               |
| 1.00            | 1.00(0.99-1.01)      | 0.48            | 1.00          | 1.00(0.99-1.01) | 0.71          |
| **DBP (mmHg)**  |                     |                 |               |                 |                 |               |
| 0.99            | 0.99(0.98-1.00)      | 0.12            | 0.99          | 0.99(0.98-1.00) | 0.11          |
| **Albumin (g/dL)** | 0.42              | 0.43(0.36-0.51) | <0.01         | 0.45            | 0.45(0.38-0.52) | <0.01         |
| **Hemoglobin (g/dL)** | 1.11            | 1.17(1.09-1.26) | <0.01         | 1.00            | 1.05(0.98-1.12) | 0.16          |
| **Bicarbonate** |                     |                 |               |                 |                 |               |
| 0.97            | 0.96(0.94-0.98)      | <0.01           | 0.98          | 0.98(0.96-1.00) | 0.02          |
| **Hypokalemia** |                     |                 |               |                 |                 |               |
| No              | 1                    | 1               |               | 1               | 1               |               |
| Yes             | 1.13                 | 1.05(0.80-1.38) | 0.71          | 1.15            | 1.16(0.90-1.49) | 0.25          |

**Adjusted for gender, age, DM = diabetes mellitus, CVD = cardiovascular disease, BMI = body mass index, SBP = systolic blood pressure, DBP = diastolic blood pressure, albumin, hemoglobin, bicarbonate in mmol/L, hypokalemia. Early-late = eGFR of >5 ml/min/1.73m², Very late = eGFR < 5 ml/min/1.73m², P = P-value. 95%CI = 95% confidence interval.

**Discussion**

This is the first observational study utilizing real world nephrology data from a tertiary referral hospital in Thailand. It compares all-cause mortality and technique failure based on the time of peritoneal dialysis initiation in a large cohort of stage-5 CKD patients. Our results found no statistically significant difference in median time from initiation of PD to mortality or technique failure comparing between patients who early-late started PD (eGFR>5 ml/min/1.73m²) and those whose eGFR less than 5 ml/min/1.73m². The mean pre-dialysis eGFR in the early-late group was 7.5 (range: 5.0 to 14.0) ml/min/1.73m² and was 3.2 (range: 1.0: 4.0) ml/min/1.73m² in the very late group.

Mean pre-dialysis eGFR in patients who start PD at >5 ml/min/1.73m² is higher than some countries
including Taiwan (5.0), New Zealand (6.4), Australia (7.3), and lower than the United Kingdom (8.5), the United States (11.0), Hong Kong (9.1) and Korean (7.8 – 8.2)\[13\]. While mean pre-dialysis eGFR before starting PD of less than 5 ml/min/1.73m² seems very low, however, it is closely in comparison with some Asian countries that it covers the ranges of 3.29 to 8.9 ml/ min/1.73m²\[14\]. These differences may be due to various estimated-GFR formula used and racial differences across country.

Several studies suggested that when the GFR falls less than 6 ml/min/1.73m² recommend initiation of dialysis with no consideration of uremia or malnutrition, or should be initiated before the GFR has fallen to 6 mL/ min/1.73 m², even if optimal pre-dialysis care has been provided and patient is asymptomatic\[15\].

While the guidelines recommend that PD consideration be taken as soon as 6 mL/min/1.73 m² or less, the absence of difference in the effect on mortality or technique failure comparing from very late PD start to early-late PD start planning was observed. Since the higher eGFR, nephrologists and patients may feel more comfortable deferring the start of RRT knowing there with no significant difference in rates of all-cause mortality and rates of technique failure. Both peritoneal and hemodialysis have a significant impact on the quality of life of patients and their caregivers. Both forms of RT also have potential complications such as infection, blood pressure instability, and metabolic abnormalities. Previous studies have shown that starting dialysis with high eGFR could be a cause of death \[14\], however, considering patients’ clinical conditions should be taken into this critical decision\[10, 11, 13-18\]. Although the current study found no benefit on clinical outcomes compared between initiating PD at very late or at early-late, clinical symptoms were not included in the analysis. Another potential benefit is reduction in resource utilization, which could reduce the financial burden to the health system. This is an especially important consideration in Thailand where the government health system covers the cost of renal replacement therapy for many patients, and the prevalence of chronic kidney disease patients is growing.

Our study has several strengths. We have a large sample size, with data was obtained from the largest database of stage-5 CKD patients in Thailand, which also contained information about important confounders such as diabetes and cardiovascular diseases that included in the analysis. There were no patients lost to follow-up. Our mortality rates and cause of death are reliable as they were confirmed with data from the Ministry of Interior, Thailand.

A limitation of our findings is that they are based on an observational study using eGFR values. However, it provides a compelling evidence for further studies of using the GFR-estimating formula between the popular use in healthcare setting in Thailand to compare with the Thai eGFR formula to inform decisions regarding the initiation of dialysis.

**Conclusion**

We found that there are no differences in the time from initiation of dialysis to death or technique. The high eGFR calculated by CKD-EPI formula is more likely to provide the same treatment results comparing to the very low eGFR. Therefore, nephrologists should plan to start PD for patients based on eGFR and patients’ symptoms or without symptom. Asymptomatic patients with stage-5 CKD may be safely managed with eGFR <5 ml/min/1.73m², by doing this, patients may benefit from the delayed PD initiation.

**Ethical Considerations:** The Ethical Committee of KhonKaen University approved the exemption for obtaining informed consent in this study with the reference number of HE622214. The administrative board of a participant hospital allowed the research to use the data (EC number: 22/62).

**Acknowledgement:** The authors appreciate the support from the administrative committees of the participating Hospital for allowing us to utilize the precious data from the hospital information system.

**Conflict of Interest:** No conflicts of interest to declare.

**Source of Funding:** No grants were involved in supporting this work.

**References**

2. Lopez-Vargas PA, Tong A, Sureshkumar P, Johnson DW, Craig JC. Prevention, detection and management of early chronic kidney disease: a


The Effect of Hypokalemia on Early-onset Peritoneal Dialysis-related Peritonitis

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Bandit Thinkhamrop⁴, Jadsada Thinkhamrop⁴, Chitranon Chan-on⁵

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Abstract

Background: Early-onset peritoneal dialysis-related peritonitis (EOP) increased technique failure and mortality among peritoneal dialysis (PD) patients. However, whether hypokalemia is the risk of EOP remains unclear.

Objective: This retrospective cohort study aimed to identify the association between hypokalemia within the first 3 months after PD initiation and EOP.

Method: A total of 947 PD patients registered at the Kidney Unit in Chaiyaphum regional hospital from January 2011 to December 2018 were recruited and followed up. The first EOP episode within 6 months after the initiation of PD was a primary outcome. Logistic regression was used to identify the association.

Results: Of the total, 485 experienced hypokalemia. 90 patients, developed EOP, 61 were from the hypokalemic group (12.6%). Hypokalemia was a significant risk factor of EOP (OR, 2.36; 95% CI, 1.42 to 3.94; P=0.01), as well as decreased serum bicarbonate level (OR, 0.90; 95%CI, 0.82 to 0.99; P=0.026) and decreased hemoglobin level (OR, 0.72; 95% CI, 0.57 to 0.90; P=0.004) and elevated sodium (OR, 1.07;95% CI, 1.00 to 1.15; P=0.046) while controlling other covariates.

Conclusions: Hypokalemia within the first three months after PD initiation was a significant risk factor of EOP.

Keyword: First episode of peritonitis, hypokalemia, EOP.

Introduction

PD-related peritonitis and malnutrition are serious complications among peritoneal dialysis (PD) patients¹. PD-related peritonitis has impact on both patient survival and technique failure²⁻⁴. In addition, early-onset PD-related peritonitis (EOP) was identified as an important risk factor for mortality and technique failure in peritoneal dialysis patients²⁻⁵.

A recent observational multicenter study reported that EOP was more likely predictor of technique failure⁶. Risk factors of PD-related peritonitis are the main focus of the PD community because reducing the risks indicates improvement of quality of care. Many modifiable medical factors were identified as risks for PD-related peritonitis such as hypoaalbuminemia, hypokalemia, obesity, depression, absence of vitamin D supplementation, and invasive intervention⁷. The known
risk factors of EOP are early use of PD catheter, male, hypoalbuminemia, and higher Charlson Comorbidity Index score\(^7\text{-}^9\). The influence of hypokalemia on EOP has not been observed in these studies\(^6\text{-}^8\text{,}^9\).

PD situations in Thailand, nutritional indicators which are serum albumin and hypokalemia were found the poorest in the Peritoneal Dialysis Outcomes and Practice Patterns Study (PDOPPS)\(^10\). Eventhough the facility peritonitis rate was comparable with those in the UK and AUS/NZ\(^11\), we wonder whether these nutritional factors might contribute to peritonitis rate in our population. In PD patients, hypokalemia is a common electrolytes disorder. Hypokalemia caused by a variety of factors, including poor nutritional status, low potassium intake, intracellular shift and loss into the dialysate\(^12\text{-}^13\). The association between peritonitis rate and hypokalemia was not clear and inconclusive\(^14\text{-}^17\).

Thus, we retrieved the data from the retrospective observational study to evaluate whether hypokalemic episode within the first three months of PD initiation increased the odds of EOP.

**Materials and Method**

**Inclusion and exclusion criteria:** Adult PD patients who survived after 90 days of PD initiation in the Universal Health Coverage scheme of Chaiyaphum Hospital were enrolled from January 2011–December 2018. The Exclusion criteria were aged younger than 15 and had incomplete laboratory data. The patients who experienced hypokalemic episode within three months after PD commencing was grouped to compare the odds of having EOP with another group by using multiple logistic regressions to adjust the effect of potential confounders.

The prescription PD dose was three bags of 2 liters 1.5% dextrose solution per day. We titrated dosing to 4 bags per day in some patients depending on clinical conditions. Blood chemistry was tested before PD catheter placement, 1-2 weeks after PD initiation (titrated to achieve maximum dose), at four weeks later and then every eight weeks until reaching six months. Blood chemistry was performed by colorimetric method.

**Hypokalemia and EOP definitions:** The serum potassium level within three months of PD commencing was used to define hypokalemic status if the level was less than 3.5 mEq/L. The patients who had a hypokalemic episode at least once were classified into a hypokalemic group. Therefore, misclassification that might occur if using mean serum potassium can be avoided. In order to explore the nature of serum potassium in our patients, we calculated the mean value of potassium of every visit within the first three months of PD commencing, as well as the median value of potassium.

Peritonitis episodes were recorded in local data registry system by fulfilling at least 2 out of 3 criteria: 1) clinical features consistent with peritonitis, i.e. abdominal pain, and/or cloudy dialysate effluent; 2) dialysis effluent white cell count > 100/uL or > 109/L (after dwell at least 2 hours), with > 50% polymorphonuclear; and 3) positive dialysis effluent culture. Relapsing peritonitis case (an episode that occurs within four weeks of completion of therapy of a prior episode with the same organism or one sterile episode) was excluded. According to the previous literature, the early-onset PD-related peritonitis is PD-related peritonitis occurring within the first six months of PD commencing.

**Data Collection:** Demographic, clinical characteristics, laboratory data, peritonitis, diabetic status, body mass index (BMI), date of start and stop PD, and peritonitis date were retrieved from the Peritoneal Dialysis Registry of the hospital. All laboratory data were electronically transferred from the Hospital Information System in order to lessen human error. Baseline data were collected at the first date of PD commencing included age, gender, body weight and height for BMI and diabetic status. Pre-dialysis baseline serum creatinine was collected for eGFR calculation using CKD-EPI formula\(^18\). Laboratory data collected within 1-6 months of PD commencing included bicarbonate, serum sodium, BUN, uric acid, serum phosphate, calcium, albumin, haemoglobin, and total lymphocyte count. Due to its multiple measurement conditions, we used the mean value of these biochemical parameters from the PD at the start date until the day before EOP episode for the patients who had experienced EOP, and the mean of all 6-months measurements of the patients who had never experienced EOP.

In the study period, 947 from 1,215 PD patients had been enrolled for analysis. Of these patients, 268 patients were excluded due to being younger than 15 years (12 patients), had no laboratory data (140 patients), and withdraw from PD before 90 days (116 patients). 485 experienced hypokalemia, while 462 were not. Total EOP were 90 patients, 61 were in the hypokalemic group (12.6%).
Results

Sample Characteristics: Patient characteristics are shown in Table 1. Per the study design, the hypokalemic group was similar to the normokalemic group regarding age, BMI, pre-dialysis eGFR, TLC, bicarbonate, hemoglobin, calcium, phosphate, BUN, uric acid, and sodium but was more predominate of female, more diabetes, and lower serum albumin. The median (min: max) of mean serum potassium level of the hypokalemic group and the normokalemic group was 3.45 (2:5.44) and 4.3 (3.5:6) meq/L, respectively. Noticed that some patients in the hypokalemic group had mean serum potassium higher than 3.5 meq/L. However, they had experienced a hypokalemic episode at least once within the first three months. That is why they were classified.

Table 1: Clinical characteristics of total population separated by serum potassium level < 3.5 meq/L

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Hypokalemia</th>
<th>No hypokalemia</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>485(51.2)</td>
<td>462(48.8)</td>
<td>947</td>
</tr>
<tr>
<td>Gender—no(%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>288(57.3)</td>
<td>215(42.7)</td>
<td>503(53.1)</td>
</tr>
<tr>
<td>Male</td>
<td>197(40.6)</td>
<td>247(53.5)</td>
<td>444(46.9)</td>
</tr>
<tr>
<td>Diabetes Mellitus—no(%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>203(41.9)</td>
<td>251(54.3)</td>
<td>454(47.9)</td>
</tr>
<tr>
<td>Yes</td>
<td>282(57.2)</td>
<td>211(42.8)</td>
<td>493(52.0)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean(SD)</td>
<td>57.8(12.2)</td>
<td>54.4(13.2)</td>
<td>56.1(12.8)</td>
</tr>
<tr>
<td>Median (min: max)</td>
<td>59.2(17.5:87.4)</td>
<td>55.5(15.9: 87.2)</td>
<td>57.3(15.9: 87.4)</td>
</tr>
<tr>
<td>BMI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean(SD)</td>
<td>22.7(3.6)</td>
<td>22.87(3.9)</td>
<td>22.8(3.7)</td>
</tr>
<tr>
<td>Median(min: max)</td>
<td>22.6(14.2:33.8)</td>
<td>22.3(14.5: 35.6)</td>
<td>22.5(14.2: 35.6)</td>
</tr>
<tr>
<td>Potassium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>3.5(0.5)</td>
<td>4.4(0.5)</td>
<td>3.8(0.6)</td>
</tr>
<tr>
<td>Median (min: max)</td>
<td>3.5(2:5.4)</td>
<td>4.3(3.5:6)</td>
<td>3.7(2:6)</td>
</tr>
<tr>
<td>Albumin before EOP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean(SD)</td>
<td>3.1(0.5)</td>
<td>3.4(0.5)</td>
<td>3.2(0.5)</td>
</tr>
<tr>
<td>Median(min: max)</td>
<td>3.1(0.9:4.7)</td>
<td>3.4(1.8:4.7)</td>
<td>3.3(0.9:4.7)</td>
</tr>
<tr>
<td>eGFR at baseline</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>3.9(2.3)</td>
<td>3.7(2.1)</td>
<td>3.8(2.1)</td>
</tr>
<tr>
<td>Median(min: max)</td>
<td>3.00(1:19)</td>
<td>3.00(1:16)</td>
<td>3.00(1:19)</td>
</tr>
<tr>
<td>TLC before EOP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean(SD)</td>
<td>1,600(557)</td>
<td>1,619(549)</td>
<td>1,610(553)</td>
</tr>
<tr>
<td>Median (min: max)</td>
<td>1,520(478:3,719)</td>
<td>1,537(537: 4,810)</td>
<td>1,530(478: 4,810)</td>
</tr>
<tr>
<td>Bicarbonate before EOP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean(SD)</td>
<td>24.5(3.00)</td>
<td>24.0(3.2)</td>
<td>24.3(3.1)</td>
</tr>
<tr>
<td>Median(min: max)</td>
<td>24.3(15.5:34.2)</td>
<td>23.9(13.5: 34.4)</td>
<td>24.1(13.5: 34.4)</td>
</tr>
<tr>
<td>Hemoglobin before EOP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean(SD)</td>
<td>8.6(1.2)</td>
<td>8.7(1.2)</td>
<td>8.7(1.2)</td>
</tr>
<tr>
<td>Median(min: max)</td>
<td>8.6(5.4:13.2)</td>
<td>8.7(4.5:12.1)</td>
<td>8.7(4.5:13.2)</td>
</tr>
</tbody>
</table>
### Demographic Hypokalemia No hypokalemia Total

#### Calcium before EOP
- Mean (SD): 8.4(0.9) 8.4(0.8) 8.4(0.8)
- Median (min: max): 8.4(5.0: 13.2) 8.4(5.4: 11.7) 8.4(5.0: 13.2)

#### Phosphate before EOP
- Mean SD: 4.7(1.2) 5.0(1.4) 4.8(1.3)
- Median (min: max): 4.5(2.0: 10.5) 4.8(1.7: 11.7) 4.6(1.7: 11.7)

#### BUN before EOP
- Mean (SD): 62.9(18.7) 68.3(20.8) 65.6(19.9)
- Median (min: max): 60.3(19.9: 157.0) 65.2(22.4: 164.6) 62.5(19.9: 164.6)

#### Uric acid before EOP
- Mean (SD): 8.1(1.7) 8.4(1.5) 8.2(1.6)
- Median (min: max): 7.9(4.1: 14) 8.3(5.0: 14.7) 8.1(4.1: 14.7)

#### Sodium before EOP
- Mean (SD): 134.2(4.0) 135.6(3.4) 134.9(3.8)
- Median (min: max): 134.8(120.4: 142.8) 136.0(124.1: 144) 135.5(120.4:144.0)

**Remark:** BMI=body mass index; EOP=early-onset peritoneal-related peritonitis; eGFR= estimated glomerular filtration rate; TLC=total lymphocyte count; BUN=blood urea nitrogen

In the bivariate analysis (Table 2), hypokalemia, low serum albumin, serum bicarbonate, hemoglobin, and BUN were associated with EOP.

**Table 2: Explanatory variables for early-onset peritoneal dialysis-related peritonitis**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Crude OR</th>
<th>95% CI</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypokalemia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Yes</td>
<td>2.15</td>
<td>1.35 to 3.41</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>DM</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Yes</td>
<td>0.87</td>
<td>0.56 to 1.34</td>
<td>0.527</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Male</td>
<td>1.54</td>
<td>0.10 to 2.39</td>
<td>0.052</td>
</tr>
<tr>
<td>Age</td>
<td>1.01</td>
<td>1.00 to 1.03</td>
<td>0.128</td>
</tr>
<tr>
<td>Albumin</td>
<td>0.53</td>
<td>0.36 to 0.79</td>
<td>0.002</td>
</tr>
<tr>
<td>eGFR</td>
<td>0.97</td>
<td>0.87 to 1.08</td>
<td>0.543</td>
</tr>
<tr>
<td>TLC</td>
<td>1.00</td>
<td>1.00 to 1.00</td>
<td>0.034</td>
</tr>
<tr>
<td>CO₂</td>
<td>0.87</td>
<td>0.81 to 0.94</td>
<td>0.000</td>
</tr>
<tr>
<td>BMI</td>
<td>0.99</td>
<td>0.93 to 1.05</td>
<td>0.631</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>0.65</td>
<td>0.54 to 0.79</td>
<td>0.000</td>
</tr>
<tr>
<td>Calcium</td>
<td>0.88</td>
<td>0.68 to 1.14</td>
<td>0.324</td>
</tr>
<tr>
<td>Phosphate</td>
<td>1.14</td>
<td>0.98 to 1.33</td>
<td>0.093</td>
</tr>
<tr>
<td>BUN</td>
<td>1.02</td>
<td>1.01 to 1.03</td>
<td>0.001</td>
</tr>
<tr>
<td>Uric acid</td>
<td>0.90</td>
<td>0.78 to 1.04</td>
<td>0.154</td>
</tr>
<tr>
<td>Sodium</td>
<td>1.02</td>
<td>0.97 to 1.09</td>
<td>0.421</td>
</tr>
</tbody>
</table>
The multivariable analysis (Table 3) confirmed that hypokalemia was a statistically significant risk factor of EOP (OR, 2.36; 95% CI, 1.42 to 3.94; P=0.01) after adjustment for age, gender, diabetes status, albumin, eGFR, TLC, BMI, calcium, phosphate, BUN, and sodium. EOP was also significantly associated with decreased serum bicarbonate level (OR, 0.90; 95% CI, 0.82 to 0.99; P=0.026), decreased hemoglobin level (OR, 0.72; 95% CI, 0.57 to 0.90; P=0.004) and elevated sodium (OR, 1.07; 95% CI, 1.00 to 1.15; P=0.046) while controlling other covariates.

Table 3: Associations of early-onset peritoneal dialysis-related peritonitis and hypokalemic episode in the first three months

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Number</th>
<th>EOP(%)</th>
<th>Crude OR</th>
<th>Adjusted OR</th>
<th>95%CI</th>
<th>P-Value</th>
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<tbody>
<tr>
<td>Hypokalemia</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>No</td>
<td>462</td>
<td>29(6.3)</td>
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<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Yes</td>
<td>485</td>
<td>61(12.6)</td>
<td>2.15</td>
<td>2.36</td>
<td>1.42 to 3.94</td>
<td>0.001</td>
</tr>
<tr>
<td>DM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>454</td>
<td>46(10.1)</td>
<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
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<tr>
<td>Yes</td>
<td>493</td>
<td>44(8.9)</td>
<td>0.87</td>
<td>1.03</td>
<td>0.62 to 1.71</td>
<td>0.913</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>503</td>
<td>39(7.8)</td>
<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Male</td>
<td>444</td>
<td>51(11.5)</td>
<td>1.54</td>
<td>1.31</td>
<td>0.79 to 2.17</td>
<td>0.297</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td>1.01</td>
<td>1.02</td>
<td>1.00 to 1.04</td>
<td>0.128</td>
</tr>
<tr>
<td>Albumin</td>
<td></td>
<td></td>
<td>0.53</td>
<td>0.74</td>
<td>0.45 to 1.22</td>
<td>0.242</td>
</tr>
<tr>
<td>eGFR</td>
<td></td>
<td></td>
<td>0.97</td>
<td>1.11</td>
<td>0.99 to 1.25</td>
<td>0.143</td>
</tr>
<tr>
<td>TLC</td>
<td></td>
<td></td>
<td>1.00</td>
<td>1.00</td>
<td>1.00 to 1.00</td>
<td>0.229</td>
</tr>
<tr>
<td>CO₂</td>
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<td></td>
<td>0.87</td>
<td>0.90</td>
<td>0.82 to 0.99</td>
<td>0.026</td>
</tr>
<tr>
<td>BMI</td>
<td></td>
<td></td>
<td>0.99</td>
<td>1.03</td>
<td>0.96 to 1.10</td>
<td>0.467</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td></td>
<td></td>
<td>0.65</td>
<td>0.72</td>
<td>0.57 to 0.90</td>
<td>0.004</td>
</tr>
<tr>
<td>Calcium</td>
<td></td>
<td></td>
<td>0.88</td>
<td>1.22</td>
<td>0.91 to 1.65</td>
<td>0.183</td>
</tr>
<tr>
<td>Phosphate</td>
<td></td>
<td></td>
<td>1.14</td>
<td>1.05</td>
<td>0.84 to 1.31</td>
<td>0.676</td>
</tr>
<tr>
<td>BUN</td>
<td></td>
<td></td>
<td>1.02</td>
<td>1.01</td>
<td>1.00 to 1.03</td>
<td>0.057</td>
</tr>
<tr>
<td>Uric acid</td>
<td></td>
<td></td>
<td>0.90</td>
<td>0.87</td>
<td>0.73 to 1.03</td>
<td>0.114</td>
</tr>
<tr>
<td>Sodium</td>
<td></td>
<td></td>
<td>1.02</td>
<td>1.07</td>
<td>1.00 to 1.15</td>
<td>0.046</td>
</tr>
</tbody>
</table>

Discussion

The result showed that hypokalemic episode within the first three months after PD commencing is a significant risk factor of EOP. Our finding was both similar and different from previous studies. The possible explanation might be the difference in defining hypokalemic status. In addition, the association in some studies were not adjusted for important confounders.

Firstly, the majority of studies identified hypokalemia based on time-average potassium levels, measured repeatedly throughout the observational period, while some did not clearly define how it was classified hypokalemia\textsuperscript{(14,17)}. Our study is the first analysis using the clearly defined process of hypokalemic episode identification. In the study, the patients who had a hypokalemic episode (less than 3.5 mEq/L.) at least once were classified into a hypokalemic group. We considered that the averaged serum potassium level might not reflect the actual status of hypokalemia because the hypokalemic status in some patients might be concealed by post-correction normokalemia, and
hypokalemia can recurrent even after being cured. As we can see in the table 1, some patients in the hypokalemic group might not be classified as hypokalemia if we used time-averaged serum potassium because their mean serum potassium level was higher or equal to 3.5 mEq/L.

Secondly, some literatures indicated the association between hypokalemia and PD-related peritonitis. However, some were more likely to insufficiently adjusted for confounding factors. Hypokalemia may relate with malnutrition and poor general conditions. Besides serum albumin level, total lymphocyte count is one of the nutritional indexes that should be enrolled in the multivariable adjustment to lessen the influence of malnutrition and hypokalemia on PD-related peritonitis. We adjusted for the nutritional index such as total lymphocyte count which rarely considered in the same research question. These findings support the proposed mechanism of hypokalemia affecting intestinal dysmotility and increasing the risk of peritonitis.

The averaged serum albumin level before EOP has not shown is a significant risk factor in our analysis. It might be that serum albumin at baseline might not be affected much at the early period but can be progressively declined after PD commencing because of peritoneal protein loss and long-term associated nutritional factors. On the other hand, low serum bicarbonate and decreased hemoglobin level were significantly associated with EOP. Therefore, the time-average serum bicarbonate before the day of EOP event is more likely to be the sign of systemic inflammation in individual patients or an early sign of EOP. The mechanism is still unclear and needed to be further determined. Besides, the time-averaged hemoglobin might not be a real risk factor of EOP but rather a coincidentally correlated factor with malnutrition or inadequacy, which strongly associated with peritonitis.

To confirm that hypokalemia has an influence on PD-related peritonitis via intestinal dysmotility, Enterobacteriaceae should be the significant pathogens in our population. Unfortunately, we did not include the pathogen profile into the analysis. Moreover, the study cannot explore technique contamination which is one of the factors involving the PD-related peritonitis. Furthermore, it is the single center analysis which lacks information of dialysis adequacy, residual renal function, diuretic usage, angiotensin-converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARBs) usage in the analysis.

For advantages, the study applied electronically transferred data from HIS to analysis which help reducing human error. Additionally, the study included objective nutritional indexes in a routine lab for adjustment. Either applying 6-months averaged biochemical values, or at baseline values, hypokalemia still observed as a significant risk factor of EOP.

**Conclusion**

Hypokalemia within the three months of PD commencing was a significant risk factor of EOP. It is a warning sign that should be seriously concerned. More frequent follow-up, exploring the causes, and continuous supplement administration in complicated cases.

**Ethical Considerations:** The Ethics Committee of KhonKaen University approved this study (reference number: HE632093). Chaipayah Hospital approved the authors to use the data (EC number: 4/63).

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**References**


Psychological Forensic of Political Party Court Judges: Analysis of the Political Party Court Judges’ Independence Based on the Law No. 2 of 2011 on the Change of the Law No. 2 of 2008 on Political Parties

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Abstract

The Political Party Court has been given a mandate by the Law No. 2 of 2011 on Political Parties to resolve the party’s disputes. The research results show that there is an unclarity in the constitutional law on the requirements of the Political Party Court Judges and the mechanism to appoint them, which gives room for the parties to create their own mechanisms. Practically, this has caused problems, as the party’s administration contributed in determining and appointing the Political Party Court Judge, even though those administrators have the potential to be one of the parties in the dispute trial due to the party’s policies. This condition causes psychological and psychic pressures to the Party Judges. Thus, they cannot be independent in making verdicts in a trial. This fragility makes the Political Party Court Judge powerless in making verdicts in the internal level of the political parties.

Keyword: Psychology, Party, Court, Judge, independence, Law.

Introduction

The presence of political parties is a must in democratic and modern politics.¹ This is because a democratic state is built upon a system of parties.² A democratic mechanism which is carried out through direct election has changed the democratic paradigm in Indonesia, where there are the great desire and determination to choose the president and the vice in the parliament with the basis of every citizen’s civil and political rights, as guaranteed in the constitution.³ This change of paradigm cannot be separated from the roles of the parties.

Political parties on one hand have the position as one of the democratic buffers for the governmental stability.⁴ On the other hand, they also become a facility for the citizens to channel their political aspirations and interests, both by being directly involved as the committee or as sympathizers.⁵ In the momentum of the democratic event, there are four general elections in every five years, which are the general election to choose legislative judges and the president, the election of governors, the election of regents/mayor, which are inseparable from the roles of the political parties.

In consequence, there are structural disputes, dismissals as party managers, laying off of judges without clear reasons. The party’s structural disputes have happened since the pre-independence era, post-independence in the Old Order Era⁶, in the New Order Era⁷, and even in the Reformation Era. Yet, the political parties have not produced a strong construction of democratic politics in terms of its organization and in terms of a democratic public spirit⁸, especially in resolving internal political party disputes.

Since the issuing of the Law No. 2 of 2011 on the Change of the Law No. 2 of 2008 on Political Parties, and also as stated in the Republic of Indonesia Fascicles of 2011 No. 8, the resolution of political party disputes is carried out at the Political Party Court or that of other names which have such authority. This Court is formed internally, with the foundation of the party’s basic budget and budget of the party’s affairs.
There are many problems caused by the placement of the Political Party Court as an internal part of the party and also the filling of the Political Party Court by the party’s committee. On one hand, the Political Party Court gives the power to make a verdict on cases. But, on the other hand, it is an internal part of the party, thus there may be a conflict of interest, where there is the desire to protect their colleagues. Apart from that, the appointment of the Political Party Court judges involves the party’s administrators. Ironically, the political party’s administrators will be one of the parties which will have disputes and will process cases in the Political Party Court. Thus, this will produce a relation of patron-client, which has the potential to create an unequal attitude in the process of the political party dispute resolution.

The Political Party Court judges may experience psychological pressure in giving a verdict on the cases which involve the party’s administration and also the party’s leaders. The position of the Political Party Court as a member of the party under the administration of the Chairperson creates an unhealthy psychological condition. The problem of this research is, “Can the Political Party Court judges be independent in giving a verdict on the party’s disputes in unhealthy psychic and psychological conditions?”

**Research Method**

This is a socio-legal type of research. This type of research is based on the normative-legal knowledge (the constitutional regulations) which then adjusts and compares with the reality, as the law in action. This means that apart from analyzing and observing the research objects from the positive law point of view, it also analyzes the legal phenomenon in the society or the social facts.

Experts of psychology in the past defined their field of study as the “study of mental activities.” With the development of the behaviorism paradigm at the start of this century, where the emphasis of study is only things which may be measured objectively, psychology is then defined as “a behavioral study.” The definition of psychology from the Great Indonesian Language Dictionary as quoted by Atkinson is the study which is related to mental processes, both normal and abnormal ones, and their influence towards the behavior.

The psychological approach towards the judges have the aim to analyze the judges’ behaviors as legal subjects in seeing the occurring legal phenomena. This approach towards the judges emphasize the humans’ ability in law, including from the laws and the judges’ verdicts. The psychology of law assumes that the characteristics, the participants, and the condition may influence how a judge issues a verdict. In those characteristics, it includes the capability of those people as judges, their perspectives, their values, their experiences and also all factors which influence their behaviors. For example, will a judge personnel give a “guilty” verdict to a thief due to hunger? Will a judge from the A tribe have more sympathy towards a perpetrator whose tribe is also A?

In the psychological perspective of the judges, the behaviors of the participants in the legal system are not only results from their internal quality, but also from the environment where they worked at. The Political Party Court judges have the same dilemma, where they are psychically and psychologically influenced by the environment. Political parties have the obligation to form a Political Party Court or that of other names to resolve disputes which happen internally in the parties. Such disputes are resolved at the Political Party Court, by the Political Party Court judges, with all of their problems.

**Table 1: Internal Dispute Resolution Institutions in Political Parties**

<table>
<thead>
<tr>
<th>No.</th>
<th>Political Party</th>
<th>Name of the Dispute Resolution Institution</th>
<th>Number of Assemblies</th>
<th>Registration Letter as noted by the Ministry of Law and Human Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PDIP</td>
<td>Party Court</td>
<td>7 People</td>
<td>Number: M.HH.06.AH.11.01, on September 27, 2019.</td>
</tr>
<tr>
<td>4</td>
<td>PKB</td>
<td>Arbitration Assembly</td>
<td>5 People</td>
<td>Number: AHU.4.AH.11.01.11, on August 22, 2019.</td>
</tr>
<tr>
<td>No.</td>
<td>Political Party</td>
<td>Name of the Dispute Resolution Institution</td>
<td>Number of Assemblies</td>
<td>Registration Letter as noted by the Ministry of Law and Human Rights</td>
</tr>
<tr>
<td>-----</td>
<td>----------------</td>
<td>-------------------------------------------</td>
<td>----------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>6</td>
<td>PKS</td>
<td>Arbitration Assembly</td>
<td>5 People</td>
<td>Number: B-36/K/DPP-PKS/1437, on March 2, 2016.</td>
</tr>
<tr>
<td>7</td>
<td>Demokrat</td>
<td>Honorary Assembly/Demokrat Party Court</td>
<td>5 People</td>
<td>Number: AHU.4.AH.11.02-22, on October 16, 2017.</td>
</tr>
<tr>
<td>8</td>
<td>PAN</td>
<td>PAN Party Court</td>
<td>4 People</td>
<td>Number: M.HH-10.AH.11.01, on December 20, 2019.</td>
</tr>
<tr>
<td>9</td>
<td>PPP</td>
<td>DPP PPP Party Court</td>
<td>9 People</td>
<td>Number: M.HH-10.AH.11.01 on November 5, 2018.</td>
</tr>
</tbody>
</table>

**Data processed from the Indonesian Ministry of Law and Human Rights:** Based on the table above, there are different names of the dispute resolution institutions formed by Indonesia’s various parties. There are also different numbers of the Political Party Court judges, or that of different names. The 2011 Law on Political Parties obliges all parties to submit the structure of the Political Party Court, or that of other names, to the Ministry of Law and Human Rights.

The Political Party Court judges who were appointed through the internal mechanism of the parties must be reported by the party to the Ministry of Law and Human Rights. According to A. A. Teohari (Head of the Political Party Sub-Directory of the Republic of Indonesia’s Ministry of Law and Human Rights) in a conversation (February 17th, 2020), in practice, there are two types of such reports: “First, the political party only reports it as according to the stipulations of Article 32, where the Chairperson and the General Secretary sign a letter which delivers the Political Party Court structure. The second variety is, sometimes the Party will insert the Political Party Court structure to be included in the management structure.”

The Political Party Court judges’ scope of authority, as stipulated in Article 32 clause (5)No. 2011 of the Political Party Law are as follows: resolving management disputes, laying off cadres without clear reasons, misuse of power, financial accountability, objections on the party’s decrees. It even states that in management disputes, the Political Party Court judges’ verdicts are final and binding.

Then, in the practical level, the political party cadres have the perception that it is difficult for the Political Party Court judges to carry out their roles and functions by applying the principles of impartiality, justice, and objectivity. Such pessimistic attitude was uncovered from the statement of a Party Judge, Y. B. Badeode, a member of the Demokrat Party Court in a conversation (February 28th, 2020):

... so that the Political Party Court may exist, it must be acknowledged by the party, and must be independent. It cannot be controlled by the Central Board nor the Chairperson. Yet, there is the concern that if the Political Party Court is too strong, it will be regarded as a second power, even though the Political Party Court is an internal part, thus it should be independent.

Then, M. Wahid, a Legislative member of Ternate City, a cadre of PPP, in a conversation (December 23rd, 2019) stated that:

... there is the potential of a conflict of interest when the Political Party Court issues a verdict. The term is “jeruk makan jeruk”, which means that the Political Party Court is filled by people of that party, and the objects put on trial at that court are verdicts of the Political Party leaders, which means that they are the verdicts of that party itself. Then, there is a room for cadres to seek justice at the Political Party managers through the Political Party Court. This is where the objectivity is tested.

The political party members’ perceptions influence their choice in determining the institution to resolve political party disputes who are believed as able to bring justice. The Political Party Court judges’ psychological condition which are suspected as not independent makes the problematic cadres or administrators choose to resolve their issues through mechanisms other than through the Political Party Court, which is through a lawsuit to the District Court.
Table 2: Choice Comparison of Party Dispute Resolution through the Party Court and through the District Court from 2011 to 2018

<table>
<thead>
<tr>
<th>No.</th>
<th>Political Party</th>
<th>Dismissal of Party Judge</th>
<th>Management Disputes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Political Party Court</td>
<td>District Court</td>
</tr>
<tr>
<td>1</td>
<td>Golkar</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>PPP</td>
<td>-</td>
<td>14</td>
</tr>
<tr>
<td>3</td>
<td>PAN</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>Demokrat</td>
<td>29</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Gerindra</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>39</td>
<td>47</td>
</tr>
</tbody>
</table>

Source: Data processed from the Republic of Indonesia Supreme Court

Based on the data of the five political parties which were participants of the general election above, the problems are dominated by the case of dismissal of the parties’ members, where there were 86 cases. Then, there were 13 cases which were related to the management. The data above show that in resolving the parties’ cases, the cadres do not choose to resolve them through the Political Party Court. But they choose to send a lawsuit directly to the District Court. Then, according to Sulistiyono and Isharyanto the most basic form of courtly independence is the independence in issuing a verdict, which has reference to the judges’ capabilities to decide upon a case independently according to the law, without the influence of other parties or other institutions.

The personal independence of the Political Party Court judges is influenced by the relations between the party who appoint and the party who is appointed (patron-client). In this case, Political Party Court judges were chosen and appointed by the party’s management. Thus, there is a high chance for a tolerant attitude to return the favor. This will influence the personal independence. This creates an unhealthy psychological condition for the Political Party Court judges as they cannot be objective.

According to Sulistiyono and Isharyanto, the impartial behavior in a courtly process may only be established if the judge may release him/herself from the conflict of interest or the collegial spirit with the parties in the trial. If a judge sees the potential for a conflict of interest in handling a case, thus that judge must step down.

That is why, one of the requirements which must be fulfilled by a judge in handling a case is that there cannot be a conflict of interest. If there is a potential for it, that judge has the obligation to step down. The resignation of a judge in a District Court in handling a case where there is a conflict of interest is facultative. If the judge does not step down, it will imply to the invalidity of the verdict.

Principally, the main job of a court is to accept, investigate, judge, and resolve all cases which are proposed. According to Mertokusumo, “It is not an easy job to explore, follow, and understand the legal values which live in the society.” Thus, the profession as a judge is a job which needs adequate expertise, time, and knowledge to explore, understand, and judge a case based on the values of justice. That is why the law on Judicial Power gives very tight requirements to the judges.

Even so, the tight requirement to be appointed as judges, the noble task and the great responsibility in upholding the law and justice are not applied in filling the profession of judges in the Political Party Court. This is because the procedures in filling the Political Party Court judges are fully up to the party’s mechanism. Thus, there is the tendency for a dominant subjective consideration in appointing the Political Party Court judges. Those who are appointed are the people who can work together with the party’s managers. At least, those who are chosen have the tendency to make verdicts which side the interests of the party’s managers.
This patron-client relation in filling the Political Party Court judge position is against the _nemo judex in rexsua_ principle, which believes that there is no good judge for him/herself. As an _ius constituedum_ there needs to be a law on filling the Political Party Court judge position in the constitutional level by limiting the double position for the Political Party Court judges and accommodating Political Party Court judges from elements outside of the party who are independent, and who are appointed through the highest forum in making the party’s decisions.

**Conclusion**

The Political Party Court judges experience psychological and psychic pressures which make them unable to act or give a verdict on the case in a party independently. The Political Party Court judges may be pressured by the party’s managers or administrators due to their status as a party member, which may be laid off anytime.

Such unhealthy psychological and psychic condition of the Political Party Court judges is very clear. Thus, the party members prefer resolve disputes in the District Court rather than bringing it to the Political Party Court. They realize the Political Party Court judges’ tendency to not be independent, and that as members of the party, they must comply with the party’s leadership. But on the other hand, they must resolve disputes or conflicts which involve the party’s administrators or managers.

**Conflict of Interest:** No

**Source of Funding:** Author

**Ethical Clearance:** Yes

**References**


Protection for Trafficking Victims: The Perspectives of Law and Psychological Health

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Abstract

Human trafficking is a crime carried out by a dark society of some people, and its network is between countries and in international borders. Most victims come from developing countries. The main aim of this crime is to force young boys and girls to work in sexual sectors. There is economic oppression as they are exploited for the interests of the agents, distributors, and crime syndicates as what is similar to other illegal activities which regard trafficking, such as trafficking of domestic workers, fake marriage, illegal jobs, and illegal adoption. This research analyzes the legal protection for human trafficking victims and the health impacts. This is a doctrinal legal research, strengthened by the qualitative field research. It uses the constitutional and case approaches. Based on the results of the study and the discussion, it can be concluded that there are some impacts of the child trafficking in the aspects health and other aspects for the children. The government needs to formulate and to refine the constitutional regulations regarding the health protection for victims of child trafficking.

Keywords: Health impacts, legal impacts, child trafficking, protection, psychology.

Introduction

The phenomenon of child trafficking has long developed in countries such as Saudi Arabia, Japan, Malaysia, Hongkong, Taiwan, Singapore, and even Indonesia. No country is immune from trafficking. Each year, it is estimated that 600,000 until 800,000 men, women, and children are internationally trafficked for sexual exploitation¹.

They use the threat of violence and even the violence itself. They kidnap, undergo fraud, forgery, and misuse of power and position. They give payments or benefits so that they receive the agreement of the people who have control of the victims².

One of the urgencies of this child protection is encouraged by the understanding that children are still inherently and relatively weak in their growth and development processes². Even, if viewed from the victimological perspective, Finkelhor⁴ in his book entitled “Childhood Victimology” stated that children are human beings which are most prone to become victims of criminal activities in the society, not only the conventional crimes which target adults, but also specific crimes which happen only to children. Child trafficking is one of the worst actions of power experienced by women and children.

It is also a criminal action which is a violation of the human rights². Human rights ignorance becomes very clear when relating to children and their rights. The violence against children is so massive that a lot of them become victims of child trafficking. There are tens of thousands of women under the age of 18 in Indonesia who wander day and night as sex commodities. On top of that, millions of Indonesian children are also forced to work improperly, such as becoming beggars, peddling newspapers on the streets or scavenging⁵.

Arif gives the definition that victims are those who suffer physically and mentally as a result of other

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people’s actions who seek the fulfillment of their own interests or other people’s, which is against the interests and the rights of the people who experience the loss. The human trafficking issue often become the discussion topic in the field of legal studies and social studies. There has been quite enough interventions, policies and formulations of the constitutional regulations regarding this problem to minimize the case prevalence of the human trafficking in the future.

This is actually a very good thing, apart from the fact that there are legal aspects which handle this issue, it also proves to the society that human trafficking is a crucial issue which must be faced together. The cases of human trafficking often start from document fraud.

The cases of sexual exploitation which happen in Indonesia increase by 30% each year. Victims of the commercial sexual exploitation to children are underage children who have high risks in being infected with diseases due to free sexual activities. From time to time, some opinions which relate the human trafficking with the issue of the human rights violation emerge. Starting from that time, new policies were issued, which start to pay attention to the aspect of the victims in human trafficking.

Some efforts have been carried out by the government, non-governmental organizations, and various social movements. These efforts include the preventive and controlling efforts in various situations where human trafficking is prone to happen. According to the statement the problem is how do the child sexual workers who are victims of human trafficking in a prostitution site assess the reproductive health and the psychological health?

**Research Method**

The method of this research is qualitative, using the case study design with the method of profound interview to some informants, which consist of children and guardians of children. This research aims to dig into the physical and health impacts of the trafficking victims. This research obtains information on the knowledge of the child informants regarding the physiology and the reproductive health. The victim suffered syphilis, or what they usually call kapatil. Meanwhile, about HIV/AIDS, they believe that it is a disease which may be infected through the nose and mouth, and that to prevent oneself from being infected. They also suffers stress and trauma after the incident even after several years.

**Discussion**

There needs to be an adequate legal protection for crime victims, as it is not only a national issue, but also an international one. Generally, prostitution is defined as someone’s involvement in a sexual behavior or activity, in this case intercourse, with the aim to trade that activity with something else, usually in the form of some amount of money. Even, the majority of the trafficking victims who were exploited sexually became pregnant, which leads them to undergo abortion. This condition often threatens their lives. Based on the Governmental Decree No. 16 of 2014 regarding Reproductive Health, abortion is a prohibited activity, and is only allowed in certain conditions, such as the indication of medical urgency, like a pregnancy which threatens the health of the mother and the fetus; pregnancy due to rape (it may only be carried out if the pregnancy age is at most 40 days from the first day of the last menstruation period).

This Governmental Decree regulates on how abortion may be done only in certain conditions, and how abortion is carried out safely with the help of doctors. With this Governmental Decree, it is hoped that abortion is no longer carried out carelessly. It is also to minimize the number of extramarital pregnancies or unwanted pregnancies.

This is where the familial strength becomes an important thing, because it can give mental support to the victims. Quoting from an article, it is said that generally, a family has these functions: 1) Replacement of the population, the function to continue its offspring; 2) Care of the young, the function of caring for children; 3) Socialization of new members, the function to socialize cultural values, norms, and language to family members; 4) Regulation of social behavior, the function of regulating sexual behavior; 5) Source of affection, the function to give affection. Child trafficking is a phenomenon indicating that the family does not function well. A similar thing was stated by Kramer as cited in Lehmiller, where sexual workers suffer some diseases which regard the physical and the psychological condition.

From the numerous diseases they suffered, sexually-transmitted diseases and HIV/AIDS are the categories which receive the highest attention, as they have the highest correlation towards the health of the sexual workers, in this case the reproductive and the sexual health. Apart from that, the sexual workers are regarded as one of the mediators in the infection of that disease.
The basic principles of the public health are promotive, preventive, curative, and rehabilitative, where this is certainly in line with the initiating movement which carry the background of the human rights approach. Human trafficking may be regarded as a public issue, as it influences the social and the mental aspects of an individual, a family, and even the whole community of various generations. The many cases of human trafficking and the complexity of this issue makes the policy-makers face difficulties in finding the right method to prevent it.

Human trafficking is very worrying, but the crime increases with diverse modus operandi year by year. This is because the public still lacks of understanding of human trafficking. Moreover, the law enforcers often consider human trafficking as a common crime. On top of that, legal policy products are still unable to give attention to victims of trafficking.

In Indonesia, prostitution is regarded as a morality/decency crime, and it is an illegal activity which violates the law. In the ratification of the Republic of Indonesia’s Constitution No. 7 of 1984, women trafficking and prostitution is regarded as violence towards women. Prostitutes are workers who turn themselves in, who sell the service of carrying out sexual activities to the public, and receiving payment according to the initial agreement. Prostitution is the sale of sexual services, such as oral sex or sexual intercourse. Someone who sells the sexual services are called prostitutes or what is usually called commercial sexual workers. The activity of prostitution is an activity which must be regarded as taboo, as it is morally contradictory to the values, religion, and norms. Prostitution is one of the social problems which raises concerns.

There are many factors which cause prostitution to be part of a child’s life. One of them is the low knowledge of the child on prostitution. Apart from that, important factors include the lack of attention from parents, lesbianism which is visible in a woman, the influence of alcohol, the reading materials of children on prostitution, and even the current sophisticated communication technology. The most influencing result of this social problem is the increase of unwanted pregnancies.

According to the World Health Organization, there are some health and other impacts of human trafficking to the human beings. These are the impacts which results from the human trafficking cases: The victim’s terrible mental health condition is the dominant health effect and it clearly brings loss. The psychological consequences include: depression, post-traumatic stress disorder, and other anxiety disorders; thoughts of suicide; and somatic conditions including physical disfunction.

The victims are socially isolated. For example, they are prohibited from contacting their families, and their space for mobility is also restricted. This is used to maintain the power over the children in a trafficking condition, such as emotional manipulation using threats and empty promises.

The victims are also exploited economically. The children who are sold do not have the power to make decisions of what they can do. They are not paid for their services. Even, the traffickers may impose fees to the victims for housing, clothes, food, or transportation.

There is a legal insecurity for the people who undergo interborder travel, especially when the trafficker or the illegal business owner confiscate the identification documents, or if they give fake information regarding their rights, including regarding the access to health services. This condition does not only limit the society’s use of the health facilities. Yet, it may also cause unjust deportation or imprisonment. It is impossible for the trafficked victim to be regarded as crime victims. Unfortunately, they are regarded as violators of migration regulations, workers or prostitutes who are against the law. They may be imprisoned in the correctional centers or imprisoned as illegal immigrants. When they come back home, the trafficking victims may have the same trouble as when they were trafficked overseas. Plus, they must deal with new health problems and other challenges, including stigma and psychological problems. Meanwhile, for the children who try to stay in that location, they often face discomfort or pressures.

In the first three months of 2019, the Indonesian Commission for Women and Children has supervised and watched over eight cases. The ones which stand out are handled by the police force. The cases are spread out almost evenly in all parts of Indonesia, with the average number of three victims in each case. On January, five children were involved in a storefront sex prostitution in Bali, as stated by Solihah, Commissioner of Child Trafficking and Exploitation, the Indonesian Commission for Women and Children), in Menteng, Central Jakarta, March 29th, 2019.

Based on the results of study, 30%-87, 8% of
victims accessed health services during the period of exploitation. Most of them are illegal workers or blue-collar workers, children, and women. We know that there are risk factors, signs, and symptoms\textsuperscript{16} of a trafficking case. In the efforts to make the medical aspect as one of the keys in developing the identification tool of human trafficking, the health workers must be equipped with the knowledge that the risk factors which exist in a population do not always indicate that human trafficking is happening\textsuperscript{17}. But, the increasing risk factors of a population may cause that population to become prone to human trafficking.

The symptoms which are found during the anamnesis period or the physical examination may become an indicator that human trafficking has happened or is happening. These signs and symptoms may be in the form of sexually transmitted diseases which are not treated, the patients do not know where they are, there are abnormal physical wounds, and when the patients come, they are accompanied by someone who has the tendency to be dominating during the anamnesis process between the patients and the doctors. The existence of these signs and symptoms must lead to interventions from some parties. Yet, it is unfortunate that there are not enough trainings on this case from the various sectors (the medical, legal, and social sectors). This causes the loss of the signs and symptoms which may identify trafficking, which may then lead to an intervention from the health workers.

Other studies also found that the trafficking victims tend to open up more to health workers as opposed to police officers. This strengthens the fact that the medical sector has a unique position to identify these signs and symptoms and treat them. Even though the trafficking victims are regarded as a hidden population due to the complexity of this issue, as it is connected to criminality and violation of rights by the regulation policies which are currently developed, yet at some point of time, these victims will interact with the outside world through the medical sector. Because of that, the existence of the trafficking signs and symptoms may become the ideal intervention point to initiate an identification and further services.

**Conclusion**

The victim’s terrible mental health condition is the dominant health effect and it clearly brings loss. The psychological consequences include: depression, post-traumatic stress disorder, and other anxiety disorders; thoughts of suicide; and somatic conditions including physical disfunction. Victim need a social, health and psychological care to recover their physical and psychological health. The collaboration between the public health discipline and the medical aspect carried out by the doctors and nurses in hospitals, private clinics, and other medical service offices may become the new holistic solution in handling the human trafficking problem.

**Conflict of Interest:** No

**Source of Funding:** Author

**Ethical Clearance:** Yes

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A Comparative Study of Some Physiological Variables between People with Obesity and Non-obesity

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Abstract

The tremendous technological progress that led to the dependence of individuals on the machine in the modern age and in all different fields led to the lack of human movement and thus the lack of its physical and physiological efficacy, which made it vulnerable to infection with many diseases, which are called diseases of lack of movement The ideal body weight is a vital subject for the human being during the stages of his life and the development of his maturity. As well as, it is one of the necessary indicators to follow the health, functional and psychological state in which researchers and specialists work in the medical, sports and psychological fields. The importance of study is to have knowledge regarding the physiological variables of obese and non-obese people and making comparisons between them to understand the positive effects of the ideal weight of individuals, which is reached through the practice of physical activity and constantly on the physiological variables and work to develop and improve these variables in a way that serves the health aspect. The researchers used the descriptive method in the survey. It is the best approach in achieving the study goals. The study sample was chosen in an intentional way. It was represented by the students of the third stage of the College of Physical Education at the University of Basra, where the sample size reached (30) students from the College of Physical Education and Sports Science. It was divided into two groups, and the size of each group was (15) participants, after excluding the female students who were (5). Dividing the sample into two groups, one that suffers from an increase in weight and another of normal weight according to the body mass index, measuring blood pressure, the number of heartbeat and measuring some physiological variables. The researchers concluded that people without obesity are healthier and more active than infected people who suffer from many disorders and problems in their physiological variables.

Key words: Body weight, physiological variables, blood variables.

Introduction

The tremendous technological progress that led to the dependence of the individual on the machine in the modern era and in all different fields led to the lack of human movement. Thus, it causes the lack of its physical and physiological efficacy, which made him vulnerable to many diseases, as the muscles move by converting chemical energy into mechanical energy. This cooperation determines the efficiency of the physical movement and thus advances the level of performance whenever these changes are positive in order to achieve the process of physiological change and the response of the body’s systems to the performance of pregnancy(1).

The ideal body weight is a vital subject for the human being during the stages of his life and the development of his maturity. The physiology is concerned with studying the effect of the change in body weight in every part of it and its relationship to changes in the body’s internal organs and organs. The degree of these changes is related to many factors including the level of physical activity of individual. “Even if we worked to improve and develop a person’s fitness level, whether athletic or non-athletic, so that each element of fitness was developed without working to measure and define the components of his body, and more specifically determining what a person carries from his fat mass, it must be a program...
that lacks accuracy scientific and that leads us to the optimal elements.”

The Problem: The physical measurements of the weight and proportion of the fatty component are considered a basic for building the individual. That is, physical and motor activity lead to maintaining weight. Thus, it constitutes a critical importance in reducing or reducing physical and health deterioration. All studies indicate that non-athletic people have increased their weight and increased their blood pressure and have increased fat percentage in the blood. While those who exercised have maintained their cholesterol level, pressure of blood and their average of weight too, especially in adulthood, as this stage is considered one of the important stages in which the rate of obesity increases. Hence, it affects some physiological variables in the body.

The significant of the Study: The importance of the study lies on knowing the physiological variables of obese and non-obese people and making comparisons between them to understand the positive effects of the ideal weight of individuals, which is reached through the practice of physical activity and constantly on the physiological variables and work to develop and improve these variables in a way that serves the health aspect.

The aims of the Study: Identify the values of some physiological variables and compare these variables between obese and non-obese people.

The Procedure: The researchers used the descriptive method in the survey method. It is the best method to facilitate the achievement of the study aims. The descriptive approach is “an accurate visualization of the interrelationships between society, attitudes, tendencies, desires and development. The research gives an image of real life, setting indicators, and building future predictions.” The aim of selecting the sample is to obtain information about a given society. As for the study population, it is the group through which researchers wish to generalize the results of its study. The sample of study was chosen in the intentional way. It was represented by the third stage students of the Faculty of Physical Education at the University of Basra, where the sample size reached (30) participants from the students of the College of Physical Education and Sports Science. The sample was divided into two groups and the size of each group was (15) participants after excluding the students sample of exploratory experience whose number was (5). The researchers used multiple tools as means by which they can reach the required data.

The devices used to make the measurements are:
1. An electronic medical scale for measuring the German made weight to the nearest (50 g).
2. A tape to measure the length.
3. Medical syringes to draw blood (40) syringes and sterile materials.
4. Plan tube
5. Cool box

This procedure is consistent with most studies and research conducted in the same field which was “under the conditions of the sample abstaining from food at least 12 hours before drawing blood”. The blood drawing process was performed in the laboratory of Al-Jumhori General Hospital in Basra city, where the amount of blood withdrawal from each individual of the sample (five cc). The measurements that the researchers measured are (hemoglobin, blood sugar, and York acid, and blood viscosity, number of heart beats, number of breaths, systolic blood pressure, diastolic blood pressure). Before conducting the above measurements, the researchers conducted a survey experiment on Monday 12/03/2018 on a group of five female students and they were excluded from the main measurements of the study.” The exploratory experiment is a scientific training for the researcher to determine the positives and negatives that occur during the test procedure to avoid them.”

In order to achieve homogeneity among the individuals of the sample for each of the two research groups (obese and non-infected), the Law of Coefficient of Twist was used as their grades were limited to (+3), which indicates the good distribution of the sample and its homogeneity in the study. This indicates the good distribution and homogeneity of the sample in the research. The statistical program (spss) version 22 was used by researchers to treat the results statistically.
Displaying and analyzing the results of some physiological variables for students with obesity and non-obesity:

Table (1): Shows arithmetic mean, the standard deviation, the calculated, tabulated values (T) and the statistical result of blood variables tests for students with obesity and non-obesity.

<table>
<thead>
<tr>
<th>Tests</th>
<th>Not obese</th>
<th></th>
<th>Obese</th>
<th></th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AM (SD)</td>
<td>AM (SD)</td>
<td>Calculated V</td>
<td>Tabled V</td>
<td></td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>11.23(0.55)</td>
<td>10.11(0.26)</td>
<td>4.126</td>
<td>2.88</td>
<td>Moral</td>
</tr>
<tr>
<td>SU</td>
<td>85.6(6.21)</td>
<td>98.5(5.8)</td>
<td>5.612</td>
<td>2.88</td>
<td>Moral</td>
</tr>
<tr>
<td>S.Uric acid</td>
<td>6.19(1.42)</td>
<td>9.98(2.99)</td>
<td>4.826</td>
<td>2.88</td>
<td>Moral</td>
</tr>
<tr>
<td>Blood viscosity</td>
<td>31.8(1.32)</td>
<td>35.1(2.14)</td>
<td>5.81</td>
<td>2.88</td>
<td>Moral</td>
</tr>
</tbody>
</table>

Table (1) includes the presentation of some of the results obtained by the researchers through measurements of the indicators of blood variables under study. It analyzes these results and discusses them after conducting statistical treatments for them. Through the results that the researchers reached, they found the significance of the differences for the hemoglobin variable, the significant difference between female students without obesity and obesity in the variable (hemoglobin). Thus, it affects the daily activity of persons. Low levels of hemoctylene that transport oxygen to working muscles affect performance, which leads to a build-up of lactic acid and an inability to continue functioning (muscle fatigue).<sup>7</sup>

The amount of hemoglobin in blood is more for boys and adults than for girls.<sup>8</sup> From the foregoing, we conclude that there is an inverse correlation relationship between the increase in the percentage of fats (obesity) and the percentage of hemoglobin, since most times the increase in obesity is offset by a decrease in blood hemoglobin levels, and this is the reason for the significant difference between female students without obesity and those with obesity in the variable. For the benefit of other students, the women attribute the reason for this increase in the percentage of (S. Uric acid) in the blood of female students with obesity and the normal rate due to the unhealthy diet followed by obese women, which was a major reason for increasing their weight. It contains a lot of meat and fat.<sup>11</sup> As one of the reasons for the high level (S. Uric acid) is eating meat in large quantities. As well as, the exercise of sports activities has a role in reducing levels (S. Uric acid) by stimulating blood circulation work to regulate the percentage of salts in the body and work to get rid of excess salts by putting them out by way of recognition. This is confirmed by Bahaa El Din Salama that increased activity of hormones, enzymes, and energy materials that participate in the metabolism process.<sup>12</sup>

we find the indicates that there is a significant difference between female students without obesity and those with obesity in the variable and for the benefit of students who are not infected and researchers attribute the reason that the level of blood viscosity is related to the number of red blood cells in one cubic milliliter of blood. “The viscosity and density of the blood are related to the amount of red blood cells, hemoglobin and protein plasma components.”<sup>13</sup> In the case of immobility and activity, the degree of blood viscosity increases, which hinders the ease of its flow into the blood vessels.<sup>14</sup>
Table (2): Shows arithmetic mean, standard deviation, calculated (tab) value, tabulation, and statistical result for examinations of some physiological variables for female students with obesity and non-infected

<table>
<thead>
<tr>
<th>Tests</th>
<th>Not obese</th>
<th>Obese</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AM SD</td>
<td>AM SD</td>
<td>Calculated V</td>
</tr>
<tr>
<td>Heart rate count</td>
<td>75.6 2.67</td>
<td>83.7 3.94</td>
<td>4.386 2.88</td>
</tr>
<tr>
<td>The range of breath</td>
<td>24.7 5.86</td>
<td>26.5 6.85</td>
<td>6.85 3.154</td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td>121.4 2.792</td>
<td>129.6 8.395</td>
<td>8.395 4.628</td>
</tr>
<tr>
<td>Diastolic blood pressure</td>
<td>80.7 2.195</td>
<td>85.5 2.22</td>
<td>10.382 2.88</td>
</tr>
</tbody>
</table>

As for Table No. (2), it presents some of the results that the researchers reached through measurements of some physiological variables under study. Through it, we find that the number of heartbeats significant difference between students without obesity and those with obesity in the variable for the benefit of other students injured. The researchers attribute the reason to the lack of physical activity and the inactivity of female students with obesity. Moreover the lack of activity works to increase the heart rate because the heart muscle needs greater effort, constriction and extroversion, and then it increases Fatigue of the arteries(15).

We find significant difference between female students without obesity and obese women in the variable and for the benefit of female students Non-infected. There searchers attribute the reason to the lack of fat for students without obesity, which leads to maintaining the average number of breathing times within normal limits, unlike female students with obesity. (Al-Hamoud et al., 2002) notes that “the breathing rate represents the number of breathing times and for athletes.”

The rate is lower because training works to enhance the efficiency of the breathing process, as the athlete needs a smaller number of breaths to transport the same volume of air.”Having a look on the variable systolic blood pressure rate, we find significant difference between female students without obesity and those with obesity in the variable and in favor of female students who are not infected. To overcome this pregnancy, the heart muscle compensates for this by increasing the volume. “Nayef Magdy and Sobhi Ahmed” stress that “exercising regularly and eating low-cholesterol and fat food makes blood pressure natural in some cases, so there is no need to take medicines or their amounts can be reduced.”

Goldberg (1988) indicates that using the appropriate aerobic training method, following the conditions for feeding and controlling other healthy habits leads to a systolic blood pressure drop of 10 mm Hg from the mean(16).

As for blood pressure, we find a significant difference between female students without obesity and those with obesity in the variable and for the benefit of other students women suffer from. the researchers attribute the reason to the fact that female students without obesity are more active and active than the affected female students. “That sports activity affects in two ways the first is improving the level of physical fitness and the second is helping to strengthen the heart muscle itself. Therefore, we notice in individuals who exercise sports regularly low heart rate. There is a decrease in the blood pressure rate by comparing them with idle individuals with little movement because the people who are more mobile have flexibility in the arteries. This helps in maintaining its elasticity at the same time, maintaining the economical work of the heart(17). The injured and those who suffer from many disorders and problems in their physiological variables in general and blood variables in particular, which may be the beginning of many diseases related to obesity.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

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References


Factors Affecting Infertility and Role of Growth Hormone in Management of Female Infertility: A Review

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Abstract

At our review we will discuss the definition of infertility according to the World Health Organization (WHO), types of infertility, factors determine fertility, factors affecting infertility in both men & female as Body mass index (BMI), hormones and life style changes that are increasing in the current years and factors as (stress and smoking). Also discuss the role of Growth Hormone (GH) in management of women infertility.

Keywords: Infertility; Body mass index; Growth Hormone.

Introduction

Infertility is a major health problem that couple faces during their life. Reproduction helps the community to produce new generation for continuity of human beings in life also some communities have social concerns about reproduction as they considerate as a fortune and the couples may undergo social pressure from their families and society to have their own offspring’s. Sterility is an illness concerns the propagative device determine via fiascos to accomplish gestation afterward 12 months or additional (¹). Men infertility may be due to impaired sperm count, motility and morphology (²). Infertility may be primary or secondary infertility. Primary infertility, when pregnancy is not achieved more than 1 yr. Secondary infertility where 1 or more pregnancies in the past, but are having difficulty conceiving again (³).

Factors Determining Fertility: Factors that determine man fertility ejaculation of motile sperm (40-250 million per ml). Every sperm takes ten weeks to be created by spermatogenesis, when sperm count fall beneath 14-40 million for each ml will impairs fertility (Fig.1) (⁴), at every low sperm counts (under 5 million for each ml) in these men, may have abnormal morphology (⁵), the number of sperm of sperm created every day is controlled by number of Sertoli cells (⁶, ⁷). Sertoli cells number is the main factor that affects sperm counts (⁷, ⁸) (Fig1). The male reproductive organs inside (testes, prostate gland, vas deferens and epididymis) and externally (scrotum). The descent of testis in scrotum occurs by birth, in complete descent of testis (cryptorchidism) because low sperm count and increase risk of testicular cancer (⁶, ⁹ and ¹⁰).
Fig (1): Sperm counts affect male fertility depend mainly on amount of Sertoli cells in the testes, propagation from Sertoli cells is influenced through regulatory substance, environmental factors as sperm count below 40 million per ml decreases fertility.

In woman, fertility depend on monthly ovulation of oocyte Fig (2) within female reproductive organs (Ovary, fallopian tubes & uterus), production of mature oocyte able to be fertilized by menstrual cycle\(^ {11, 12}\), five hundred oocytes might be ovulated in puberty. The elementary oocyte in fetal ovary captured in first meiotic prophase and stay dominant till maturation resume activity in puberty triggered by follicle stimulating hormone (FSH) that stimulate follicle maturation producing estrogen to start growth of endometrium of uterus then section luteinizing hormone (LH) in mid cycle stimulate ovulation Fig (2).

Fig (2): Female hormonal regulation with changes endometrium and corresponding changes in the ovary during regular menstrual cycle without fertilization.
Factors affecting infertility

Body mass index (BMI): Body-mass-index (BMI) has minimum impaction on male semen enumeration, however ability own major possessions at feminine fecundity(13). within a womanly of regular weighing & nutrition (Fig.3a), control of follicle maturation and ovulation by LH and FSH liberate from the pituitary gland. The emission of LH and FSH is directed by gonadotropin emission hormone. FSH in addition LH adjust maturation about cavities within the ovary, whose

stimulate production of (testosterone, estradiol and progesterone) these hormones act on the uterus. Women with anorexia nervosa (Fig.3b) scarcely have normal and regular menstrual cycle(14). The action of ovaries starts to diminish due to fall in GnRH production, causing gonadotrophin concentrations very few to sustain ovarian function. Leptinconcentricity are least within below a weight lady such might be the agent such diminishes emission about GnRH (Fig.3b). Obesity on the other hand leads to sexual problems (Fig.3c)(15).

Fig (3): Regulation the secretion of GnRH causes secretion of LH& FSH from pituitary gland. Nutrition play role in female fertility by effect of Leptin hormone from fat cell& insulin from pancreas that alter presence of estradiol & testosterone (T).

Deficiency about these gender sex hormone results in an nonappearance about follicular development, on the other hand, in overweight ladies or potentially with polycystic ovary syndrome (PCOS), raise leptin and insulin scale and an expansion within LH, rather than FSH scale result infraction al expansion of cavities such excrete supernormal scale from testosterone, nevertheless scarcely ovulate (consequently least progesterone ovaries testosterone manufacture/activity to PCOS[4]. The link between overweight and polycystic ovary syndrome as ovary contains immature follicles is one of the prevalent reasons for infertility cause an ovulation (16). Its etiology is mysterious, but genetic factors are important, polycystic ovaries are linked with hormone abnormalities (overabundance emission of testosterone by the ovary). Be that as it may, there is additionally an interaction with nutrition. Polycystic ovaries are described by metabolic disturbances, including an intestinal obesity, in addition to resistance to and over-excretion of insulin(17). The outcomes of abdominal obesity in ladies with polycystic ovaries incorporate an expanded possibility of anovulation and infertility,
increased testosterone (bringing about undesirable male pattern hair) and, danger of creating type-2 diabetes in later life\cite{17}.

**Hormones:** GnRH is released from neurons in hypothalamus and stimulates the secretion of LH and FSH from the anterior pituitary gland. LH activates the interstitial cells of testes for testosterone release. FSH activates sustentacular cells of the seminiferous tubules to increase spermatogenesis and to secrete inhibin. In research done in Iraq by\cite{18}, about the effect of hormones on infertility among men & women.

Table 1 shows no significant difference between BMI in healthy men (26.11±2.31) or infertile ones (25.45 ±1.34) kg/m$^2$. But there were absolute variations between serum LH and serum FSH. The mean serum LH level of these infertile men (7.895±0.85) mLU/ml in comparison with (2.12±0.31) mLU/ml of the normal men. This outcome is high of thanormal LH value and also it significant. The serum FSH was (9.89±1.12) mLU/ml in the infertile men in contrast with the values in the control group which were lower (3.39± 1.45) mLU/ml. This result is supported by\cite{19} which showed that the plasma FSH scalewas 26.40±1.43 mLU/ml within the check collection in contrast with the scale within the monitoring group was 3.71± 1.25 mLU/ml, yonder was a remarkable link ($r= 0.67$) amongplasma FSH besides the semenamount. Serum prolactin increases in the infertile men and reach to (13.33±2.15) ng/ml compared to the monitoring assembly (5.65±3.34) ng/ml. This result agrees with\cite{19} who showed that the mean serum prolactin in test group was (18.01±1.28) ng/ml, compared to (5.43± 2.02) ng/ml of the monitoring assembly, these results is extra than double the control prolactin worth and is highly considerable ($p< 0.01$). Also,\cite{20} showed that the prolactin may suppress the production of GnRH and leading to testicular dysfunction in associated with spermatogenic arrest and decreased serum testosterone concentration. On the other hand,\cite{21} showed that any insult in the hypothalamus or pituitary (hypogonadotropic-hypogonadism) whose results in lower serum FSH & LH through increase within plasma prolactin scale may possibly causes sterility. Hyper-prolactinemia occur when excess secretion from lactotrophs in anterior pituitary.\cite{20} Prolactin induce apoptosis in spermatogonal stage of the testes but FSH to these tissue societies switches these progressions, increases secretion for a long time of FSH can induce sperm production, inazoospermia is reversible\cite{22}.

### Table (1): Compare of BMI, plasma LH, FSH, prolactin, testosterone and Leptin in the infertile and normal men \cite{18}.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Infertile men n= 21</th>
<th>fertile men n= 12</th>
<th>Normal average</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI (kg/m$^2$)</td>
<td>25.45 ± 1.34</td>
<td>26.11 ± 2.31</td>
<td>1.1-7</td>
</tr>
<tr>
<td>LH (mLU/ml)</td>
<td>7.895±0.85</td>
<td>2.12±0.31**</td>
<td>1.7-12</td>
</tr>
<tr>
<td>FSH (mLU/ml)</td>
<td>9.89±1.12</td>
<td>3.39±1.45**</td>
<td>1.5-19</td>
</tr>
<tr>
<td>Prolactin (ng/ml)</td>
<td>13.33±2.15</td>
<td>5.65±3.34**</td>
<td>3-10</td>
</tr>
<tr>
<td>Testosterone (ng/dl)</td>
<td>3.91±0.51</td>
<td>21.76±1.45**</td>
<td></td>
</tr>
<tr>
<td>Leptin (μg/L)</td>
<td>9.40±0.44</td>
<td>2.95±0.35**</td>
<td>3.84±1.79</td>
</tr>
</tbody>
</table>

Data expressed as mean±SD ** $P< 0.01$: Highly significant difference.

The level of testosterone hormone (ng/ml) has low significant difference (3.91±0.51) ng/dl in test group in comparison with control group (21.76±1.45) ng/dl\cite{23}. This result agrees with\cite{19} who found that testosterone levels markedly less(4.10±2.23) ng/dl within exam assemblage in comparison with the monitoring collection (14.02±2.48) ng/dl. Low levels of testosterone hormone may be resulted from the conversion of testosterone to estradiol by the aromatase enzyme effectfrom adipose tissue. Obese males who are rich with aromatase activity have more androgens converted into estrogen causing rise in estrogen level and a drop of androgen in the serum\cite{23}. Serum leptin has highly significant ($p<0.01$) increase in the infertile (9.40±0.44) μg/L compared with normal men values (2.95±0.35) μg/L. Leptin is an important adipose tissue derived hormone, takes a
role in regulating body weight, immune function and reproduction (24). As a result, leptin levels increases with obesity (23). Male obesity not only impact negatively on male reproductive potency by lessens sperm quality, but also adjusting the physical and cellular structure of germ cell and eventually full-grown sperm (25).

Development hormone in the arrangement of womanly sterility: Growth hormone is secreted not only from the pituitary as well as locally by the ovaries. It attaches to growth hormone receptors on surface of granulosa, the thecal and luteal cells, inducing steroidogenesis and gametogenesis (26). Growth hormone play role in ovulation process in variable steps and can growing ovarian sensitivity to receive gonadotropin and promotes follicular formation (27).

When GH receptor-deficient the development of the follicle is delayed, growth hormone besides IGF-I together a function within the secretion from the follicle from his association, and this causes eventually monofollicular development in female (26). In case of lower growth hormone, this leads to decreased plasma scale of IGF-I inhibit the follicle after rising IGF-I scale. Such averts of somewhat variance within the susceptibility to FSH of the various association follicle, and permiss similar multifollicular evolution. Through GH remediation, a variantsusceptibility to FSH amongst that follicle in addition her association are gained backvia advanced IGF-I scale, promptingmonofollicular development. In place of the follicle develops, atomic and cytoplasmic happen take place inside the oocyte to permit oocyte fertilization.

Dosage of GH co thereby: Doses utilized have run from 0.9 to 1.8 Milligrams per week, and growth hormone is ceased once conception is accomplished (28). Past investigations have utilized a lot higher doses. GH has been given every day or on interchange dates in doses running from (12 to 24 international unit) (26). One researcher has recommended an everyday weight-based dose (0.1 international unit per kilogram) (29) whereas else has compared 4 international unit every day and 12 international unit day by day (30). GH co-therapy has an unmistakable task to carry out isovarian incitement, and is viable in suitably selected cases; more studies should be done to recognize effective and efficient GH treatment regimen too improve quiet determination. Attempts should also be made to examine the impact of growth hormone treatment on oocyte fertilization and endometrial susceptibility.

Infertility is a multifactorial health problem may be affected by nutrition’s: Nutrition plays an important role infertility and undernutrition may be associated with stress or obesity that may affect female by causing (PCOs) and in male affecting semen parameters (31), we recommend having health balanced diet with doing activates. Hormones as FSH, LH, prolactin & testosterone may cause hormone disturbance for both male and female. Life style changes as smoking and alcohol will have negative impact on aspects of fertility in both sexes.

Some causes of infertility in both sexes preventable by many ways as

- Stop smoking.
- Limitation of alcohol consumption.
- Practice daily activities.
- Avoid thing lead to prolonged heat for testicles.
- Avoid exposure to pesticides, heavy metals and other toxins.

**Conclusion**

Reproduction helps the community to produce a new generation for continuity of human beings in life also some communities exert social pressure on inertial couples although it’s a saved simply by seeking medical care to exclude the multifactorial causes and care the causing problems.

**Acknowledgments:** We acknowledge the support and scientific advice of the entire staff of Biology Department and Mustansiriyah University Baghdad-Iraq.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

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**References**


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Detection of Copy Number of Mitochondrial DNA in Iraq Population

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Abstract

Mitochondrial DNA copy number (mtDNA-CN), a measure of the number of mitochondrial genomes per cell. A cell contains two copies of genomic DNA compared to a single copy of DNA per chromosome. The quantitative real-time PCR (qPCR) is the gold standard method for measuring mtDNA-CN, the quantification after DNA extraction it is an important step, the quantitation of DNA plays a central role in medical and forensic DNA analysis, which provides the information about the amount of DNA present in unknown samples. In this study the quantitative results showed that the higher value 74941 and the lower value 190. A multiplex quantitative PCR assay developed to amplify target sequences of different length, which allows for the assessment of DNA degradation in samples of forensic interest. The quantification of DNA by qPCR relies on the detection of amplified product (amplicon) at each cycle of the PCR.

Keywords: Mitochondrial DNA, copy number, qPCR, Iraq population

Introduction

Mitochondrial DNA copy number (mtDNA-CN) is increasingly used to assess the role of mitochondria in forensic field and is applicable when samples that fail to yield successful nuclear DNA profiles, in cases where nuclear DNA is significantly degraded, cannot be isolated or is present in extremely limited amounts, [1, 2].

Quantitative real-time PCR (qPCR) has been the most widely used method for measuring mtDNA-CN, partly due to its low cost and quick turnaround time. However, these advances, it is important for the field to evaluate these method in the context of the current gold standard.

In addition to the method for determining mtDNA-CN, it is important to consider the impact of DNA extraction method on mtDNA-CN, particularly due to the small size and circular nature of the mitochondrial genome. Previous research has shown organic solvent extraction is more accurate than silica-based method at measuring mtDNA-CN, which is unsurprising as column kit parameters are typically optimized for DNA fragments ≥ 50 Kb[3]. However, as all DNA extraction method have bias in the DNA which they target, measuring mtDNA-CN from direct cell lysate may prove to be a more accurate method.

Method and Materials

The study recruited 100 individuals from different south regions of Iraq between 18 and 65 years. In workflow of experiment, DNA isolated from whole blood, the copy number of mitochondrial DNA (mtDNA) was estimated by QPCR analysis using the mitochondrial gene NADH dehydrogenase subunit 1 ND1 and ND5. ND1 and ND5 copy number were normalized to half the level of GAPDH since each cell contains two copies of genomic DNA compared to a single copy of DNA per chromosome. Each sample was run in triplicate, and QPCR analysis was performed.

The qPCR reactions were performed by using the SYBR- Green qPCR, Real-time PCR analysis of two mtDNA targets and one nuDNA targets relative quantification of the copy number of mtDNA using

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calculate the copy number of mtDNA from the Ct values obtained for each of the three target genes.

**Calculation:**

a. Determination of the difference in the Ct values for the ND1/GAPDH pair
   \[ \Delta C_{t1} = C_{t} \text{ for GAPDH} - C_{t} \text{ for ND1} \]

b. Determination of the difference in the Ct values for the ND5/GAPDH pair in the same manner.
   \[ \Delta C_{t2} = C_{t} \text{ GAPDH} - C_{t} \text{ ND5} \]

c. To Find \(2^{\Delta C_{t}}\) for the values for \(\Delta C_{t1}\) and \(\Delta C_{t2}\).
   Relative mitochondrial DNA content = \(2 \times 2^{\Delta C_{t}}\)

d. Use the average of the 2 values found in step c. as mtDNA copy number\(^4\).

**Results and Discussion**

The DNA yield of extraction was subject to estimated copy number of mitochondrial DNA (mtDNA) to nuclear DNA (nuDNA) ratio for each sample. The qPCR analysis was by using the mitochondrial gene NADH dehydrogenase subunit 1 (ND1) and ND5, the nuclear gene Glyceraldehyde 3-phosphate dehydrogenase (GAPDH). In this study the differences of Ct values both mtDNA and nuDNA Ct values was measured from real-time PCR, and average the CT values from triplicate reactions mtDNA copy number to relative nuDNA amounts were calculated the copy number by using the following equations:

\[ \Delta C_{T} = (\text{nuDNA CT} - \text{mtDNA CT}) \]

Relative mitochondrial DNA content = \(2 \times 2^{\Delta C_{T}}\)

The design of the mitochondrial qPCR assay selected a region of the ND1 (NADH dehydrogenase subunit 1) gene corresponding to bases 3485-3553 of the Cambridge Reference Sequence (CRS) in order to improve the accuracy and precision of DNA quantifications \(^5\). The reason for chosen this target was previous cross-species sequence homology studies to indicated this sub region of the ND1 gene to be significantly non conserved a promising feature for developing a species specific assay and because this region of ND1 has few known SNPs especially when compared to the HV1, HV2 in control regions using a number of web based searching tools and avoiding any well-known disease associated SNPs such as the LHON associated SNP at CRS3460 designed and evaluated several assays at the ND1 target\(^6\).
In order to process a successful duplex qPCR assay it is necessary to identify reaction conditions that effectively allow two amplifications to occur independently in the same tube the goal is to avoid the predicament in which one of the amplifications reduces the PCR efficiency of the second amplification such as situation can lead to a delayed amplification for the second assay an artificially large CT value and a corresponding underestimation of the quantity of target DNA measured by that assay one strategy for avoiding this situation is to develop duplexed qPCR assay to run under conditions that limit PCR amplification of the more abundant target sequence for example by limiting the primer concentrations for this amplification [7].

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

**Reference**

Genotyping Diversity of *Pseudomonas aeruginosa* Isolates, Isolated from Baquba City

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**Abstract**

This research aims to assess the similarities and variances between MDR *Pseudomonas aeruginosa* clinical isolates from different infections using MLST molecular typing technique in Baquba city. One hundred-eighty clinical samples were collected from urinary tract, wounds and burns infections, included (110) urine, (50) wounds and (20) burns. Twenty isolates (11.11%) of *Pseudomonas aeruginosa* were diagnosed based on microscopic, morphological, biochemical tests and confirmed by VITEK-2 system. Antibiotic susceptibility test for the twenty isolates was performed against six antibiotics using disk diffusion method, the results showed (100%) resistance for Cephalothin, Ceftazdim (60%), Colistin (35%), Amikacin (25%), Ciprofloxacin (20%), while (0%) resistance for Imipenem. The results also showed that 16 (80%) of isolates were produced extended spectrum beta-lactamase (ESβL) and did not show their production for Metallo-beta-lactamase (MβLs). Biofilm was detected by Micro-Titer Plate method and the result showed that all the isolates (100%) were biofilm producers. Multi-locus sequence typing (MLST) was used because broadness and ease of access of MLST database. Seven housekeeping genes (*acsA*, *aroE*, *guaA*, *mutL*, *nuoD*, *ppsA*, and*trpE*) were sequenced and the results were compared with MLST database and allele profile for each isolate was used to determine sequence types (STs). New Iraqi bacterial strain has been identified and recorded in database of MLST (PubMLST) under the name (AS-85U).

**Keywords:** *Pseudomonas aeruginosa*, Biofilm, MLST.

**Introduction**

*Pseudomonas aeruginosa* is known as an opportunistic pathogen with a range of virulence factors in humans including biofilms formation, toxins that causing broadtissue damage hence, access to bloodstream and spreading to body tissue, as a role of colonization, invasion and persistence in human host\(^(1)\). *P. aerugenosa* represents a phenomenon of resistance to many antibiotics creating hard to treat infections. This bacteria has natural resistance such as chromosomal expression, changing outer membrane permeability \(^(2)\), and have many groups of efflux pumps\(^(3)\). In addition to production of many enzymes able to antibiotics lysis especially \(\beta\)-lactams such as Metallo \(\beta\)-Lactamases (MβLs), Extended spectrum \(\beta\) -Lactamases (ESβLs) and Ampier molecular class (AMPC)\(^(4)\).

Due to its ability to develop multidrug resistance (MDR), extensively drug resistant (XDR), and pandrug-resistant (PDR) *P. aeruginosa* has gradually become a prevalent in nosocomial infections\(^(5)\). The plasticity and complexity of the large *P. aeruginosa* genome (6.3Mbp) reveals the evolutionary adaptations conversed to this species\(^(6)\). It comprises conserved core genome with strain definiteregions that permit strains to gain or shed genomic fragments for improvement of survival traits in a wide range of environment\(^(7)\).

In order to distinguish between the isolates and clonal groups of *P. aeruginosa*, some molecular typing schemes have been described\(^(8)\). Multilocus sequence typing
typing (MLST) is an alternative method for molecular typing which is a global and accurate strain-typing system that concentrates entirely on conserved housekeeping genes and the combination of each allele\(^9\). This is aimed to define the sequence type (ST) for each isolate and provide information in the relatedness of bacterial isolates at the core genome level. MLST scheme has been first advanced for \(P.\ aeruginosa\) by Curran et al\(^{10}\) and had the most analytical value (100\%) in labeling strains as unique\(^{11}\). The standardization of MLST has given increase to databases which allow comparative analysis of allele sequences and documentation of distinctive sequence types\(^{12}\).

**Materials and Method**

**Isolates activation:** All the twenty \(P.\ aeruginosa\)'s isolates from different infection sources have been activated, and diagnosed depending on morphological, biochemical tests, and confirmed by VITEK-2 system.

**Antimicrobial susceptibility testing:** Antimicrobial susceptibility test was performed using (Kirby-Bauer standard disk diffusion method) on Mueller-Hinton agar plates against six antibiotics according to Franklin et al.\(^{13}\) based on CLSI\(^{14}\).

**Biofilm detection**

The Micro Titer Plate method (MTP) was used as following:

\(P.\ aeruginosa\) isolates were cultured on nutrient broth for 18-24 hr at 37°C aerobically. After incubation 2-4 colonies were picked up and cultured in nutrient broth until the turbidity equivalent to 0.5 McFarland (1.5×10\(^8\) CFU/ml). 200 μL of the bacterial suspensions were transferred into polystyrene micro-titer plates containing 96 flat-bottom wells and a broth without bacterial inoculum was used as the negative control. The plate was sealed and incubated for 24 hr. The bacterial suspensions then removed, and each well was washed three times with sterile saline solution (0.9% NaCl). Next, the cells stuck on the walls were fixed with 200 μL of methanol for 10-15 minutes. The methanol was removed, the plates were left at room temperature to dry and they were stained with 200 μL of crystal violet 0.5% for 10-15 minutes. The plates then washed with distilled water 2-3 times and dried at room temperature\(^{15}\). The absorbency were taken in an ELISA reader at wavelength of 630 nm, according to Tang et al\(^{16}\). The value of the optical densities for each isolate (ODi) was obtained by averaging the three wells, and this value was compared to the optical density of the negative control (ODc). The isolates were classified into four categories, according to the mean optical densities (ODi) in relation to the ODc results.

- If ODi ≤ ODc; considered non-adherent,
- ODc≤ODi≤2*ODc; considered moderately adherent and
- if 2*ODc≤ODi which considered strongly adherent.

The formation degree of biofilm production = 

\[\text{Optical density of tested isolates - Optical density of control.}\]

**Production of ESβLs detection:** ESBL production in \(P.\ aeruginosa\) was identified by the double disk synergy test (DDST) as described by Jarlier et al\(^{17}\). Mueller–Hinton agar plates were streaked with inoculum (equivalent to 0.5 McFarland) using a sterile cotton swab. An Augmentin (20 μg amoxicillin and 10 μg of clavulanic acid) disk placed in the center of the plate and, ceftazidime (30 μg), aztreonam (30 μg) ciprofloxacin (30 μg) were placed 15 mm separately center to center on the plates with a sterile forceps\(^{18}\). The plates were then incubated for 18-24 hr at 35-37°C. An enhanced inhibition zones from 5 mm or more in the presence of Augmentin is suggested as positive result for the production of ESBL enzyme\(^{19}\).

**Molecular typing**

**Selection of loci for MLST:** The seven housekeeping genes for \(P.\ aeruginosa\) were chosen according to MLST scheme firstly designed by Curran et al\(^{10}\) based on their biological function (mismatch repair, DNA replication and amino acid biosynthesis), size, location (a minimum of 6 kbp upstream or downstream from known virulence factors, lysogenic phage, or insertion sequence elements), and suitability for nested primer design and sequence diversity\(^{12}\).

**DNA extraction:** Genomic DNA was extracted according to the protocol of ABIOPureTM Total DNAExtraction kit/USA.

**PCR primer for MLST:** MLST was performed on four selected isolates out of twenty in order to investigate which sequence types of \(P.\ aeruginosa\) were present in Baquba city. The PCR primers described by Curran et al\(^{10}\) were used and prepared according to the manufacturer’s instructions installed in the working method of equipped company (Macrogen, Korea) to
become a primer in the final concentration 100 pmol/μl. Primers for the housekeeping genes used in the MLST scheme were mentioned in (table 1).

**Amplification of loci:** All extracted DNA from the four isolates went through PCR procedure in order to target the seven genes under study. Each reaction components contained 2 ng/μl chromosomal DNA, 1μl forward primer (10 μM), 1μl reverse primer (10 μM), 12.5μl master mix (2x) and 8.5μl nuclease free H2O. The reaction conditions were: initial denaturation at 95ºC for 5 min, denaturation at 95ºC for 30 sec, primer annealing at 55ºC for 30 sec, extension at 72ºC for 1 min and the final extension at 72ºC for 7 min. The amplification product was purified before sequencing process.

### Table (1): Sequences and primers sizes for the seven housekeeping genes

<table>
<thead>
<tr>
<th>Gene</th>
<th>Sequences</th>
<th>Ref.</th>
<th>Size bp</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>acsA</em></td>
<td>F</td>
<td>5’-ACCTGGTGTACGCGCTCGTAC-3’</td>
<td>Pseudomonas aeruginosa MLST database</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>5’-GACATAGATGCCCGCTCGTAC-3’</td>
<td></td>
</tr>
<tr>
<td><em>aroE</em></td>
<td>F</td>
<td>5’-TGGGGCTATGACTGGAACC-3’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>5’-TAACCCGGTTTGGATTCCTACA-3’</td>
<td></td>
</tr>
<tr>
<td><em>guaA</em></td>
<td>F</td>
<td>5’-CGGCCCTGACGTGTGAGTGA-3’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>5’-GAACGCCTGGCTGTCGTCGTA-3’</td>
<td></td>
</tr>
<tr>
<td><em>mutL</em></td>
<td>F</td>
<td>5’-CCAGATCGCGCCGGTGAAGTGA-3’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>5’-CAGGGTGCCATAGAGGACCA-3’</td>
<td></td>
</tr>
<tr>
<td><em>nuoD</em></td>
<td>F</td>
<td>5’-ACCCGGCCCTACCTGAACCA-3’</td>
<td>≈1050</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>5’-TCTGCCCCATCTGGACCA-3’</td>
<td></td>
</tr>
<tr>
<td><em>ppsA</em></td>
<td>F</td>
<td>5’-GGTGCGCTGCGGTAAGGTGTA-3’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>5’-GGTTTTCTCTTTGTCGCG-3’</td>
<td></td>
</tr>
<tr>
<td><em>trpE</em></td>
<td>F</td>
<td>5’-CCCGCCGCTTGTGATGGTT-3’</td>
<td></td>
</tr>
</tbody>
</table>

**Sequencing and blasting:** Sequencing was performed for all 7 genes of the 4 isolates. PCR product were sent for Sanger sequencing using ABI3730XL, automated DNA sequencers, by Macrogen Corporation – Korea. The results were received by email then analyzed using genus software. To get an allelic profile, the results were blasted in the *Pseudomonas aeruginosa* MLST Database (http://pubmlst.org/paeruginosa), and then the database was used to search for the STs defined by those specific allelic profiles. The sequences were confirmed through individual BLAST searches to determine their correspondence with previously sequenced *P. aeruginosa* genomes. Then the full aligned sequences were saved in FASTA format.

**Allele and sequence type assignment:** Based upon the allele numbering system in the *P. aeruginosa* MLST database, an allele number was appointed for every gene in each isolate. Alleles that differed by even a one base pair from those present in the database were denominated as “new.” Each distinct combination of seven numbers (denoting the seven alleles) was assigned a number denoting its sequence type (ST) according to the MLST database. Combinations not present in the database were considered “new” STs.

**Results**

**Antibiotics sensitivity test:** Isolates under study showed 100% resistance for Cephalothin (KF), this result agree with Hameed (20) which was 100% resistance. Ceftazidime (CAZ) showed 60% resistance which is similar to Kaur and Singh (21) finding. The resistance to Amikacin (AK) and Ciprofloxacin (CP) was 25% and 20% respectively, this result agree with Fattma et al (22) 25% and 35% respectively while Colistin showed 35% resistance. Finally, the resistance to Impinem was 0% (100% sensitive) and this result is consistence with Hameed (20) finding which was 0%, table (3).
Table (2): Number and percentages for sensitivity and resistance isolates

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>Isolates number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sensitive</td>
</tr>
<tr>
<td>IMP</td>
<td>20 (100)</td>
</tr>
<tr>
<td>Co</td>
<td>13 (65)</td>
</tr>
<tr>
<td>CAZ</td>
<td>8 (40)</td>
</tr>
<tr>
<td>AK</td>
<td>15 (75)</td>
</tr>
<tr>
<td>KF</td>
<td>0 (0)</td>
</tr>
<tr>
<td>CP</td>
<td>14 (70)</td>
</tr>
</tbody>
</table>

Biofilm production: The results showed that all the isolates included in the study had the properties of biofilms formation and the absorbency value was ranged from (0.186 – 0.21) and 25% of isolates were strongly biofilm forming this agree with Hameed\(^{(20)}\) finding which was 25%, 75% for moderately biofilm forming.

Extended Spectrum β- Lactamase Enzyme (ESβLs): The results showed that 16 (80%) of isolates under study were ESβLs producer and 4 (20%) non-producing. This result is nearly to Hyford\(^{(23)}\) result which was 88% of clinical isolates were producing these enzymes.

Multi locus Sequence Typing (MLST) and allelic profile: Allele profiles and STs can be found at (http://pubmlst.org/paeruginosa). By comparing the sequence and combination of genes the clonal relationship between isolates can be assessed\(^{(10)}\). It has been reported that isolates with the same sequence types (ST) can be considered as members of the same clone, and P. aeruginosa isolates that share at least five of the seven numbers within their allelic profile were regarded as members of the same clonal complex\(^{(24)}\) table (3).

Table (3): MLST allelic profile and strain type for P.aeruginosa isolates

<table>
<thead>
<tr>
<th>Isolates number</th>
<th>Allelic type</th>
<th>STs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>aca</td>
<td>aroE</td>
</tr>
<tr>
<td>5</td>
<td>38</td>
<td>11</td>
</tr>
<tr>
<td>7</td>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td>9</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>38</td>
<td>11</td>
</tr>
</tbody>
</table>

*In MLST database any allele not contained within database was designated as “new”

Nucleotides Sequencing of MLST: In an effort to compare MLST genes heterogenicity, polymerase chain reaction products of seven genes for P. aeruginosa isolates were sent for determining the nucleotide sequence. Sequencing was determined by an automatic sequencer. DNA sequences were analyzed and similarity were accomplished among genes of local P. aeruginosa and standard strains with Basic Local Alignment Search Tool (BLAST) in National Center for Biotechnology Information (NCBI). A subsequent BLAST search showed a 99-100% match to P.aeruginosa genomes present in GenBank for acaA sequences of these isolates, which confirmed their identity as P.aeruginosa.

New bacterial strain identification: One bacterial isolate (P7) was identified as global new Iraqi strain for differences in some nucleotide position. This new strain AS-85U was published in the MLST database https://pubmlst.org/paeruginosa/
Conclusions

Pseudomonas aeruginosa has several genetic elements that support their pathogenicity (virulence and antibiotics resistance) and the resistance of Pseudomonas aeruginosa to most antibiotics in the study indicating a correlation between multidrug resistance to antibiotics and the production of (ESβLS) enzymes and biofilm formation. Molecular techniques provide sensitive and rapid analytical tools for identification, sequencing and increases the excellence of epidemiological investigations. The newly-developed MLST method for multi locus typing of P.aeruginosa suggests an accurate diagnosis of the bacteria and detection of the source of infections and treatment.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

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References


Motivation for Choosing Neurology as a Career, among Students of Baghdad Medical College

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Abstract

Purpose: To test the influence of specific factors on motivation for neurology career and especially the effect of taking neurology course, and the effect of gender on them.

Materials and Method: This is an observational cross-sectional, self-administered questionnaire-based study. Structured online surveys were offered to a random sample of 170 final year students of College of Medicine/University of Baghdad from July to September 2018. Assessment included factors that might influence students’ choice of neurology as a future career, gender effect on those factors, and especially evaluating the impact of exposure to neurology course on their determination for choosing neurology.

Results: A total of 150 students responded to this survey (88% responder rate). About 35.3% of the participants anticipated that they would choose neurology as their future career. The strongest motivational factors were: passion in neurology (50%), role model (38%), and prestige (36%). Family and friend’s effect and having an illness in the family were less motivating factors. Taking the neurosciences module did motivate the students to choose neurology as their future career (p=0.001).

Conclusion: Neurology is generally well-regarded by students in our college. There was a statistically significant association between choosing neurology as a future career and the influence of studying neuroscience module. Other significant associations were: will to help neurologically ill patients, having passion in neurology, role model, prestige and family pressure.

Keywords: Neurology, career, medical students, neuro-module, Baghdad.

Introduction

It is often thought that undergraduates do not make their career preferences until after they have graduated from medical school. However, not only entrants of medical schools¹, but even applicants to medical schools, often have strong preferences for or against some medical careers.² ³ ⁴ Neurology, it appears, has a reputation among medical specialties of being particularly hard. Particularly interesting is the concept of “Neurophobia,” i.e., perception that neurology is a difficult and complicated subject to understand.⁵

Little is known about the factors that motivate medical students to seek careers in Neuro-medicine. Their choice has been associated with multiple factors, the main ones were intellectual property, helping people with neurological disorders, passion in neurology, role model. Other less chosen factors were prestige, family

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and friends influence, having a neurological illness in the family or among friends, and controllable lifestyle. Academic exposure to neurology course has a very prominent effect on promoting choosing neurology as a future career whether that course was taken before or after graduation.

Age was seen to affect motivation, older applicants having experience with neurology chose intellectual property over interesting in helping people, while younger ones chose the latter.

Factors that deterred students form choosing neurology were: difficulty of the subject, perception of non-interference, poor quality of life and excessive clinical activities.

As regards gender issue, there is an increase in the number of women in neurology in the United State ‘US’, but even in the US, woman are still facing gender issues when working in neurology, mostly related to underestimation of their skills, and adverse social expectations.

No study on students’ selection of neurology as future specialty was conducted before in Iraq.

This study was conducted with the objectives to evaluate the known factors that influence the student’s choice of neurology as a future career, the effect of gender on those factors, and to evaluate the impact of exposure to neurology course on their determination of choosing neurology.

**Material and Method**

An observational cross-sectional survey study was conducted from July to September of 2018 at the College of Medicine, University of Baghdad. Initially 10 students were chosen for a pilot study to assess the accuracy and reliability of the questionnaire, then 170 students were randomly selected from all final (6th) year medical students. Consent was taken from the participants and they were informed of the confidential nature of the survey. Participation was voluntary and unpaid.

Inclusion criteria: 6th grade [final year] medical students of Baghdad University/College of Medicine.

Exclusion criteria: Students who were unwilling to participate or those who incorrectly/incompletely filled the questionnaire were excluded.

The questionnaire gathered information about: Demographic data: including gender; if the students would choose neurology as a career in the future (yes or no); factors related to choosing neurology as a career (family/friends influence, family/friends doctor, family/friends with neurological disorder, being influenced by role model, being influenced by prestige, passion in neurology, interest in helping people with neurological disorders, other cause). Questionnaire about the effect of neurology module included: score of neurology course in second academic year, score of neuroscience module in fifth academic year, did neurology courses in second, fifth academic years affect your motivation for choosing neurology as a future career?

**Data management and statistical analysis:**

Initial survey forms for the pilot study were on paper and distributed manually to the students, while the final survey forms included in our study were prepared via Google forms, and were distributed online by using Facebook to all of the respondents. The data was encoded and submitted into SPSS (version 24). All the data were set as categorical variables and the descriptive statistics were presented in frequencies, percentages and 95% standard deviations, and confidence intervals. Chi-square test [and fisher exact test when applicable] were used to analyze the significance of association between different variables. Unless otherwise noted, statistical significance we set as p<0.05.

**Results**

A total of 150 students were included in this study. A responder rate of 0.88. Male respondents totaled 41 (27.3%) and 109 (72.7%) were females. About 53 (35.3%) of the participants said that they’ll choose neuroscience as their future career and the remaining 97 (64.7%) preferred to choose other specialties. Of 109 female participants 40 (36.7%) were going to choose neurology compared to 13 (31.7%) of 41 males, a non-statistically significant difference (χ² = 0.3247, p= 0.569)

**Factors related to choosing neurology as a career:**

The number of students motivated by each factor in the survey and its percentage from the whole sample was as follows: interest in helping people with neurological disorder 125 (83%), passion in neurology 77 (51%), role model 57 (38%), Prestige 54 (36%), family/friend with a neurological disorder 49 (33%), family influence 37 (24.7), presence of family/friend doctor 36 (24%).
Figure (1) displays the percentages of students choosing each motivational factor from the sample of students who were willing to choose neurology as a future career.

Descriptive statistics for motivational factors for choosing neurology per the two choice groups and significance of differences were calculated and are depicted in Table 1.

**Table 1: Descriptives and significance of motivational factors for choosing neurology per choice groups**

<table>
<thead>
<tr>
<th>Motivational factors</th>
<th>Did you choose neurology as future career?</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes (n=53)</td>
<td>No (n=97)</td>
</tr>
<tr>
<td></td>
<td>Fr</td>
<td>Mean</td>
</tr>
<tr>
<td>Interested in neurology due to family influence</td>
<td>24</td>
<td>%45</td>
</tr>
<tr>
<td>Have family/friend doctor that motivates you to choose</td>
<td>13</td>
<td>%24</td>
</tr>
<tr>
<td>neurology</td>
<td>22</td>
<td>%41</td>
</tr>
<tr>
<td>Have family/friend with neurological disorder</td>
<td>32</td>
<td>%60</td>
</tr>
<tr>
<td>Get influenced by role model</td>
<td>28</td>
<td>%52</td>
</tr>
<tr>
<td>Prestige</td>
<td>42</td>
<td>%79</td>
</tr>
<tr>
<td>Interested in helping people with neurological disorders</td>
<td>52</td>
<td>%98</td>
</tr>
</tbody>
</table>

The association between gender and the factors that influence the students’ choice of Neurology was calculated and presented in Table 2.

**Table 2: Significance of the effect of gender on motivational factors for choosing neurology as a future career**

<table>
<thead>
<tr>
<th>Motivational Factors</th>
<th>Male (n=41)</th>
<th>Female (n=109)</th>
<th>X² test statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fr</td>
<td>%</td>
<td>Fr</td>
<td>%</td>
</tr>
<tr>
<td>Interested in neurology due to family influence</td>
<td>9</td>
<td>22%</td>
<td>28</td>
<td>26%</td>
</tr>
<tr>
<td>Have a family/friend doctor that motivates you to choose</td>
<td>15</td>
<td>37%</td>
<td>21</td>
<td>19%</td>
</tr>
</tbody>
</table>
### Motivational Factors

<table>
<thead>
<tr>
<th></th>
<th>Male (n=41)</th>
<th>Female (n=109)</th>
<th>( \chi^2 ) test statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have a family/friend with neurological disorder</td>
<td>12 (29%)</td>
<td>37 (34%)</td>
<td>0.296</td>
<td>0.586</td>
</tr>
<tr>
<td>Get influenced by role model</td>
<td>16 (39%)</td>
<td>41 (38%)</td>
<td>0.025</td>
<td>0.874</td>
</tr>
<tr>
<td>Prestige</td>
<td>21 (51%)</td>
<td>33 (30%)</td>
<td>5.672</td>
<td>0.017</td>
</tr>
<tr>
<td>Have passion in neurology</td>
<td>18 (44%)</td>
<td>59 (54%)</td>
<td>1.247</td>
<td>0.264</td>
</tr>
<tr>
<td>Interested in helping people with neurological disorders</td>
<td>34 (83%)</td>
<td>91 (83%)</td>
<td>0.102</td>
<td>0.935</td>
</tr>
</tbody>
</table>

The effect of Neuroscience modules: The distribution of students according to their scores at the end of the second and fifth grade neuroscience modules per choice groups, and significance of their differences, was calculated and depicted in Table 3.

**Table 3: Significance of association of students’ scores of neuroscience modules and choosing neurology as a future career.**

<table>
<thead>
<tr>
<th>End module scores</th>
<th>Would you choose neurology as your future career?</th>
<th>( \chi^2 ) Test statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes (n=53)</td>
<td>No (n=97)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fr.</td>
<td>%</td>
<td>Fr.</td>
</tr>
<tr>
<td>Score category in neuroscience (second grade)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>6</td>
<td>11.3%</td>
<td>14</td>
</tr>
<tr>
<td>Very good</td>
<td>15</td>
<td>28.3%</td>
<td>24</td>
</tr>
<tr>
<td>Good</td>
<td>22</td>
<td>41.5%</td>
<td>36</td>
</tr>
<tr>
<td>Average</td>
<td>5</td>
<td>9.4%</td>
<td>17</td>
</tr>
<tr>
<td>Borderline pass</td>
<td>5</td>
<td>9.4%</td>
<td>6</td>
</tr>
<tr>
<td>Score category in neuroscience (fifth grade)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>0</td>
<td>0.0%</td>
<td>5</td>
</tr>
<tr>
<td>Very good</td>
<td>16</td>
<td>30.2%</td>
<td>23</td>
</tr>
<tr>
<td>Good</td>
<td>22</td>
<td>41.5%</td>
<td>28</td>
</tr>
<tr>
<td>Average</td>
<td>7</td>
<td>13.2%</td>
<td>25</td>
</tr>
<tr>
<td>Borderline pass</td>
<td>8</td>
<td>15.1%</td>
<td>16</td>
</tr>
</tbody>
</table>

Of males: 5,10,14,10,2 in 2nd grade and 1,6,18,6,10 in 5th grade had excellent, very good, good, average and borderline scores respectively. The respective results for females were 15,29,44,12,9 in 2nd grade and 4, 33,32,26,14 in 5th grade (p<0.05 for both grades).

The student’s perception of the motivational effect of taking the neuroscience module of the fifth year, and of both the second and fifth year, on their perceived choice of selecting Neurology as a future career was calculated and depicted in Figure 2. The difference was found be statistically significant (\( \chi^2 = 62.060, p<0.001 \)).
Discussion

Neurology was the career of choice for 35.3% of students in this study, suggesting that neurology is generally well-appreciated by our students. In comparison to Gupta N. etal study\(^6\) in which only 19% of students were willing to choose neurology.

The percentage of female students in our college is very high, constituting 54.4% in a prior study\(^13\) and around 72.7% in this study. Therefore gender related motivational issues to neurology must be addressed.

Analyzing the factors that are related to choosing neurology: 24.7% said that their families had an influence on their interest, whereas Gupta N. et al study showed that only 2% of the students reported family influence and pressure.\(^6\) This rather big difference could be due to cultural difference and differences in family involvement in students’ life between different societies. There was not gender difference regarding this factor.

For the family/friend neurologist influence, 24% agreed that having a family/friend neurologist doctor motivated them to pick neurology. After extensive research this was not tested by other studies as a relating factor, although it shows a large effect on students in this study. However this study didn’t reveal any significant association between this factor and the will to choose neurology as a future career. However this study did show that males are more prone to be affected by that factor than females (\(p=0.027\)).

Students who have a family/friend with a neurological disorder were 32.7%, this was also not tested by other studies. However this study didn’t show any significant association between this factor and choosing neurology as a future career at 0.05 level of significance, however the result was significant at 0.10 level. No gender difference was found in this study.

Having a role model influenced 38%, which is consistent with the findings of Thomas R. which had 37% influence on the students.\(^8\) This factor is consistently reported in most studies about motivation in neurology.\(^6,7,8\) This came here as the third highest factor that motivated students in our sample before prestige and family/friends impact, which largely agrees with earlier studies.\(^6,7,8\) This equally affected both genders in this study.

Considering neurology as a prestigious job inspired 54 (36%), on the other hand Gupta N.\(^6\), showed that 18% considered neurology as a prestige job. This might be because considering neurology as prestige might signal cultural grounds for this difference. In our study this significantly affected males more than females (\(p=0.017\)).

Passion in neurology was shown to affect more
than half of the students and without gender related differences, this agrees with the findings of Gupta N., in which also about more than half of the students (52%) were passionate and interested in neurology as a job. Passion in neurology was one of the commonest factors related to picking neurology among students in this study. Also this agrees with most studies.6,7,8

Students who reported having an interest to help people with neurological diseases were 83.3%. Also 82.6% were interested in helping people with neurological diseases in the study of Albert D.10 This agrees with most studies.6,7,8 In our study this included all students who would and wouldn’t choose neurology as a future career, males and females alike, but surprisingly it was much lower in the group who didn’t will to choose neurology as a future career that the difference was significant! Interest in helping people game first before passion in neurology, this agrees with older studies about younger students being motivated by interest in helping people as contrasted with older more experienced trainees in neurology which preferred intellectual content.7

Meanwhile, for the effect of neuroscience modules and the students’ choice of neurology, there was no statistically significant association between students’ score and their choice of neurology as a future career, and the same applies to gender effect on scores, this finding agrees with Goni U. et al which also stated having no gender associated difference with different scores.14

This study revealed a statistically significant association between choosing neurology as a future career and the influence of neuroscience of 2nd and 5th grade. These findings are supported by all prior studies6,7,8,10 all of which reported the effect of undergraduate or postgraduate courses in neurology on future choice of neurology as a career.

**Conclusion:**

Neurology is generally well-regarded by students of our college.

There was a statistically significant association between perception of choosing neurology as a future career and factors of: will to help neurologically ill patients, having passion in neurology, role model, prestige, and family pressure, in a descending manner.

There was a statistically significant association between the perception of choosing neurology as a future career and the influence of studying neuroscience module.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

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**References**


Outcome of Biliary Fistula After Liver Hydatid Cyst Surgery

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Abstract

Background: Biliary fistula after liver hydatid cyst surgery was occur in about 17.8 percent of patients in our center.

Objective: To study the outcome of biliary fistula regarding factors related to its causes and management.

Patients and Methodology: This is a prospective study of 241 cases submitted to liver hydatid surgery in Al-Sader teaching hospital in Al-Najaf city, from October 2015 to April 2019. A total of 43 patients who underwent surgery complicated with persistent leakage of bile from external drain. Prospectively collected database were gathered from patients medical records, sent for essential investigations, and treated either conservatively to give a chance for spontaneous closure, or by intervention with ERCP.

Results: Forty three patients who develop postoperative biliary fistula after hydatid cyst surgery from 241 patients (17.8 %), 230 patients treated with conservative surgery (95.4 %), 2 patients treated with radical surgery (0.82 %) and 9 patients treated with percutaneous aspiration injection reaspiration (3.7 %). All the 43 patients in this search treated with conservative surgery. Size more than 15 cm is a risk factors. Intraoperative risk factor is mainly presence of cystobiliary communication which occur in 16 patients (37.2 %). Treatment is conservative in about 23 patients (53.4 %). Treatment with ERCP in 19 patients (44.1 %). Time of intervention is from 9 – 15 days.

Conclusion: Most of patient with external biliary fistula after hydatid liver surgery can be treated conservatively and resolve spontaneously specially low output fistula.

Keywords: Hydatid cyst, biliary fistulae, Outcome, surgery.

Introduction

Hydatid disease is a zoonosis, caused by tapeworm Echinococcus infestation in its larval or cyst stage. The dogs transmit the disease to the Humans, and there is no human-to-human transmission. Three known forms of echinococcosis in humans; E. granulosus, E. multilocularis and E. vogeli.¹²

The typical hydatid cyst has a three layer wall containing a fluid. The outer one is the pericyst, the outer layer of the cyst itself is the laminated membrane (ectocyst) and the inner one (endocyst) is the germinal membrane, responsible for the production of clear fluid.³

Clinical Features: Mostly asymptomatic until complications occur. The commonest presentations: dyspepsia, abdominal pain and vomiting. Most common sign is hepatomegaly. The commonest complication is intrabiliary rupture of hydatid cysts, or may rupture to bronchial tree, or free rupture into cavities (peritoneal, pleural, or pericardial). Free ruptures can result in a potentially fatal anaphylactic reaction or disseminated echinococcosis.³

Diagnosis: The diagnosis of hydatid disease is based on an immunological test for echinococcal antigens [enzyme-linked immune sorbent assay (ELISA)], in approximately 85% of patients is positive. In approximately 30% of patients, Eosinophilia is seen. For detecting hydatid cysts, abdominal Ultrasonography

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and CT scanning are both sensitive. Abdominal MRI may be helpful to assess the characteristics features of pericyst, cyst matrix, and daughter cyst.\textsuperscript{4}

**Treatment:** Medical with benzimidazole compounds is currently indicated in

(a) primary hepatic and pulmonary cystic echinococcosis in inoperable patients.
(b) cysts in two or more organs.
(c) small multiple (5 cm) hepatic cysts.
(d) deep cysts in hepatic parenchyma.
(e) secondary prevention.
(f) recurrent.
(g) unfit elderly with unilocular cysts.
(h) specific sites (such as brain, bone, eye)

**Contraindicated for:**

(a) large cysts (10 cm).
(b) honeycomb cysts.
(c) superficial cysts that are prone to rupture.
(d) infected one.
(e) inactive one.
(f) calcified cysts and asymptomatic.
(g) chronic hepatic disease(sever).
(h) bone marrow depression.
(i) pregnancy(early).
(j) Diabetes is a relative contraindication.\textsuperscript{5}

**Minimally Invasive Techniques:**

**Percutaneous Drainage of Hydatid Cysts (PAIR)** indicated for:

(a) inoperable patients,
(b) patients who refuse surgery,
(c) Gharbi type I and II,
(d) relapse after surgery,
(e) infected cysts,
(f) failure of chemotherapy,
(g) cysts of greater than 5-cm diameter and in different liver segments,
(h) possibly pregnant women (chemotherapy contraindicated).
(i) possibly children less than 3 years old.

**Contraindications for PAIR are:**

(a) inaccessible cysts,
(b) superficial cysts,
(c) honeycomb cysts,
(d) cysts show hyperechogenic solid patterns,
(e) cysts communicating with bile ducts,
(f) partially or totally calcified cysts,
(g) cysts in the lung.

**Surgery:** Surgerical intervention in the management of liver hydatid is still the “gold standard”.

**Indications for open surgery are:**

(a) large one with multiple daughter cysts,
(b) superficial cysts that may rupture,
(c) infected cysts,
(d) cystobiliary communication,
(e) cysts with pressure effect on adjacent organs,

**Contraindications for surgery are:**

(a) patients refusing surgery,
(b) extreme age,
(c) pregnant women,
(d) concomitant severe diseases,
(e) numerous cysts,
(f) difficult to access,
(g) dead cysts,
(h) calcified cysts,
(i) small cysts <5 cm (wait and see policy).\textsuperscript{5}

**Postoperative Complications:** The incidence and significance of postoperative morbidity after conservative procedures has been exaggerated in many reports. The most frequent postoperative complications are:

(a) wound infection,
(b) chest problems,
(c) subphrenic abscess,
(d) biliary leaks, and
(e) liver abscess.

**Biliary leak and fistula:**

Biliary fistula is bile flow along an abnormal epithelial connection from bile duct into nearby hollow structure, it is either classified as

- **External** or **internal**, external mean connection to the abdominal wall through the wound of its surgery, internal type is the connection to small bowel (bilioenteric) or pleural space (thoracobiliary) or classified as

- **Primary** or **secondary**, primary type which caused by biliary lethiasis or neoplasia, secondary type caused by iatrogenic injury during cholecystectomy or other biliary surgery.

Biliary leak is bile escape the bile duct through a perforation e.g rupture hydatid cyst (internal type) or faulty surgical anastomosis. In postoperative hydatid cyst surgery, bile leakage is drainage of bile through abdominal drains, regardless of quantity, no longer than 10 postoperative days. Persistent, stable external drainage of bile for 10 days or more, is a biliary fistula.

The most frequent causes are

(a) An overlooked cystobiliary communication,
(b) Injury to a bile duct,
(c) Inadequately managed cystobiliary communication,
(d) Calcified pericyst,
(e) Hydatid debris obstructing the CBD.

**Patients and Method**

This is a prospective study of 241 cases submitted to liver hydatid surgery in Al-Sader teaching hospital in Al-Najaf city, from October 2015 to April 2019. Postoperatively, 43 of those patients develop biliary fistula.

Prospectively collected database were gathered from patients medical records including: personal data, medical history of disease, main symptoms and sign, radiological finding (site and size of cyst, single or multiple, primary or secondary, other organs involvement), and ultrasonographic findings, CXR, preoperative complications (dilated biliary tree, jaundice, cyst rupture), type of surgical intervention, presence or absence of cystobiliary communication at operation time and type of its treatment, postoperative follow-up, daily fistula output, time of spontaneous closure, time of intervention, hospital stay postoperatively and mortality.

A biliary fistula is heralded by early postoperative external drainage of large quantities of bile.

Investigations that done to the patients include: liver function test, blood picture, ultrasonographic examination of an abdomen, computerized tomography (not used routinely).

Treatment of patients with biliary fistula includes either conservative management to give a chance for spontaneous closure, or by intervention with ERCP and sphincterotomy with or without stent.

**Results**

241 patients with hydatid cyst of liver who undergoes different surgical modalities include;

1. Conservative procedures by deroofing and omental patch in 230 patients (95.4 %).
2. Radical procedures by radical cystectomy and liver resection in 2 cases (0.80 %).
3. Percutaneous aspiration injection reaspiration (PAIR) done in 9 patients out of 241 patients (3.73 %).

There are 43 patients out of 241 patients were developed external biliary fistula (17.8 %) subjected to different types of management either surgically or conservatively (Table I):

**Table 1. Characteristics of 43 cases with postoperative biliary fistula after liver hydatid surgery.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Year)</td>
<td>Mean ± SD*: 36.4±7.6</td>
</tr>
<tr>
<td></td>
<td>Range: 18-55</td>
</tr>
<tr>
<td>Gender</td>
<td>Female n (%): 24(55.8 %)</td>
</tr>
<tr>
<td></td>
<td>Male: 19(44.1 %)</td>
</tr>
<tr>
<td>Hospital stay (days)</td>
<td>7-19</td>
</tr>
<tr>
<td>Mortality**</td>
<td>1(2.31 %)</td>
</tr>
</tbody>
</table>

*SD: standard deviation, **died because of myocardial infarction.

Concerning the location and features of liver hydatid, can summarized in Table II.
### Table 2. Features of the liver hydatid cyst in the patient with biliary fistula

<table>
<thead>
<tr>
<th>Cyst characters</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right lobe</td>
<td>27</td>
<td>62.79 %</td>
</tr>
<tr>
<td>Left lobe</td>
<td>12</td>
<td>27.9 %</td>
</tr>
<tr>
<td>Bilobar</td>
<td>4</td>
<td>9.30 %</td>
</tr>
<tr>
<td>Single</td>
<td>29</td>
<td>67.4 %</td>
</tr>
<tr>
<td>Multiple</td>
<td>14</td>
<td>32.5 %</td>
</tr>
<tr>
<td>Primary</td>
<td>36</td>
<td>79.06 %</td>
</tr>
<tr>
<td>Recurrent</td>
<td>7</td>
<td>16.2 %</td>
</tr>
<tr>
<td>High output &gt;300 ml/day</td>
<td>9</td>
<td>20.93 %</td>
</tr>
<tr>
<td>Low output &lt;300 ml/day</td>
<td>34</td>
<td>79.06 %</td>
</tr>
<tr>
<td>Cystobiliary communication</td>
<td>16</td>
<td>37.2 %</td>
</tr>
</tbody>
</table>

### Table 3. Hydatid cyst size related to postoperative biliary fistula:

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Number of fistula</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-10 cm</td>
<td>6</td>
<td>13.9 %</td>
</tr>
<tr>
<td>10-15 cm</td>
<td>11</td>
<td>25.5 %</td>
</tr>
<tr>
<td>15-22 cm</td>
<td>26</td>
<td>60.4 %</td>
</tr>
</tbody>
</table>

The output of fistula, the closure time, and Management modality, time and type of intervention, can be summarized in Table IV,

### Table 4. Features of patients with biliary fistula:

<table>
<thead>
<tr>
<th>Character</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fistula closure time spontaneously in low output fistula&lt;300ml</td>
<td>19-40 day</td>
</tr>
<tr>
<td>Fistula closure time in high output fistula</td>
<td>19-117 day</td>
</tr>
<tr>
<td>Fistula output ml/day</td>
<td>190-810 ml/day</td>
</tr>
<tr>
<td>Time of intervention in low output fistula no reduction in amount *</td>
<td>21-28</td>
</tr>
<tr>
<td>Time of intervention in high output fistula *</td>
<td>9 – 15</td>
</tr>
<tr>
<td>Drain removal</td>
<td>21-119 day</td>
</tr>
</tbody>
</table>

*by ERCP and sphincterotomy with or without stent.

### Table 5. Management of post-operative patients with biliary fistula:

<table>
<thead>
<tr>
<th>Type of treatment</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservative (spontaneous closure) external drainage</td>
<td>23</td>
<td>53.48 %</td>
</tr>
<tr>
<td>Endoscopic</td>
<td>ERCP sphincterotomy</td>
<td>19</td>
</tr>
<tr>
<td>Reoperative</td>
<td>Hepatico-enterostomy</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>CBD exploration+t.tube</td>
<td>0</td>
</tr>
</tbody>
</table>

Intra-operatively, the bile leak was discovered in 16 patients, managed by different modalities as in Table VI.
Table 6. Managements performed for 16 patients with intraoperative bile leak

<table>
<thead>
<tr>
<th>Management</th>
<th>No. of patients</th>
<th>% of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suturing of cysto-biliary communication with external drainage</td>
<td>6</td>
<td>37.5</td>
</tr>
<tr>
<td>Only external drainage</td>
<td>3</td>
<td>18.75</td>
</tr>
<tr>
<td>Cyst evacuation +capitonnage</td>
<td>5</td>
<td>31.25</td>
</tr>
<tr>
<td>Evacuation with omentoplasty</td>
<td>2</td>
<td>12.5</td>
</tr>
</tbody>
</table>

Discussion

Surgery play an important role in treatment of liver hydatid. Operative options include radical surgery or conservative surgery as the patients in current study were treated. In this study there are 43 patients whose develop biliary fistula after surgery.

Female more common than male, 24 (55.8%) for female and 19 (44.18%) for male, in other research we found (73.2 %) for female and (26.8 %) for male, this is may be related to dealing with vegetable more regarding female side, age incidence is ranged from 18 to 55 years old with mean age (36.4 ± 7.6). In other research it was found similar range, Yang X et al.

Intraoperative cystobiliary communication was found in 16 patients (37.2%), only 6 of them treated with direct suturing and omental patch before they develop biliary fistula, similar percentage in other research was found; Demircan O et al. In comparison with other study; Bhattarai et al, about 13 patients from thirty patients were found with intraoperative cystobiliarycommunication which is close percentage.

A correlation between biliary fistula and site(right, left or both) in this research as it is more common in right lobe in 27 patients (62.79%) than the left lobe with 12 patients(27.9%) as it found in a similar research Gokhan et al. Kayaalp et al. of 113 patients showed that the site of the liver hydatid close to the hilum is a risk factor for a cystobiliary communication.

The cyst size was recognized as a predictive factor in the biliary fistula development. In literature, suggested size more than 10 cm plays a role in a cystobiliary communication development, compared to our study it found that the great percentage is when the cyst is more than 15 cm which was in 26 patients (60.4 %).

Multiple studies reported a history of cholangitis, high bilirubin and ALP level,a cyst size more than 10 cm and the presence of suggestive radiological findings as clinical predictors of intrabiliary rupture, and an ERCP was indicated in these cases to delineate the cyst-biliary communication.

In our study, spontaneous closure without any intervention was occur in 23 patients of 43(53.48%) in time ranged between (19-35) days, all of them with low output fistula.

In Balik AA et al a review of 304 cases, spontaneous closure in time ranged between 2-4 months inall the 10 cases with external biliary fistulae. In other studies, 7 of 12 fistulae closed spontaneously, with the closure time up to 38 days. In this study the closure time of fistula was ranged from 19 to 40 days in cases of low output fistula with gradual reduction in the amount of bile in the drain which was in 23 patients, in cases of high output fistula, closure time was ranged from 19 to 117 day with intervention. Time of intervention in low output fistula with no reduction in amount ranged form 19-28 days in other study.

Skroubis G, et al it was found that ERCP was used for the management of high-output fistulas of more than 1 week’s duration without reduction and low-output fistulas of more than 3 weeks’ duration without reduction of leakage.

19 patients in the other hand have been treated by ERCP, they have high output fistula, 2 cases of these 19 patients submitted to more than one ERCP and bigger size stent, in this search the time to intervene is ranged from 9-15 days.

In other cases when there are low output fistula but there is no decrease in amount of output, so intervention is mandatory and not to delay more than 28 days. The time from intervention to closure of fistula also ranged from 10 to 101 days.
Conclusions

Conservative treatment is the first method of treatment in low output fistula. High output fistula better not to delay intervention and treated by ERCP and sphincterotomy with or without stenting.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Dept. of surgery and all experiments were carried out in accordance with approved guidelines.

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Clomid Plus Gonadotropin Versus Letrozole Plus Gonadotropin in Stimulation of Infertile Women

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Abstract

A comparative prospective study was conducted in the High Institute of Infertility Diagnosis and Assisted Reproductive Technologies/Al-Nahrain University, from September 2019 to March 2020. The study included 60 women who attended the infertility clinic of the High Institute of Infertility Diagnosis and Assisted Reproductive Technologies/Al-Nahrain University. Follitropin Alfa ampoules 75 IU, subcutaneous, from 7th day of menstrual cycle and the dose was adapted according to the ovarian response to the dose of treatment. Other twenty females were treated with Femara (Letrozole). The study showed that the highest mean of LH (in the day of triggering of the follicle) was recorded in women under Clomid +FSH treatment (13.52±7.22 mlU/ml) followed the control group (10.1±4.21 mlU/ml) and the lowest mean was in women received Letrozole+ FSH (8.67±4.54 mlU/ml). The study also demonstrated that the mean of E2 was elevated significantly in women under Clomid +FSH treatment (280.5±191.4 pg/ml) followed by in women received Letrozole+ FSH (214.2±141.4 pg/ml) and the lowest mean was in the control group (164.7±102.7 pg/ml). The maximum mean of progesterone was recorded in in women under Clomid +FSH treatment (4.15±3.2 ng/ml) followed by women received Letrozole+ FSH and the control group.

Keywords: Clomid; Female infertility; Letrozole; FSH.

Introduction

Infertility is a disease of the reproductive system, It can be defined by the failure to achieve a pregnancy after at least one year of regular unprotected sexual intercourse in women < 35 years not using contraception and after six months in women > 35 years or due to an impairment of a person’s capacity to reproduce, either as an individual or with his/her partner, it affects about 10-15% of couples¹,². According to the World Health Organization (WHO) definition, a couple is considered infertile if, after 2 years of regular sexual intercourse, without contraception, the woman has not become pregnant³. Infertility is classified as primary (no pregnancy in the past) or secondary (pregnancy has occurred in the past not necessarily leading to live birth)⁴. The causes of infertility can be generally classified into four groups: male, female, combined(both male and female) and unexplained⁵. Some additional factors that may contribute to female infertility are behavioural factors such as diet, exercise, smoking, alcohol and drug use⁶. Combined infertility arises from the combination of male and female causes and it may be that each partner is independently fertile but the couple cannot conceive together without assistance. Nowadays, progress in ART has enabled the clinicians to treat many types of infertility⁷.

Endometrial receptivity is defined as a temporary unique sequence of factors that make the endometrium receptive to the implantation of the embryo⁸. It is the window of time when the uterine environment is conductive to blastocyst acceptance and subsequent implantation⁹. The process of implantation may be separated into a series of developmental phases starting with the hatching of the blastocyst and attachment to the endometrium and sustained the formation of the placenta. The steps start with apposition, and progress through adhesion, penetration and invasion¹⁰. The aim of the study was to evaluate the use of clomid plus gonadotropin versus letrozole plus gonadotropin stimulation of infertile women.
Patients and Method

A comparative prospective study was conducted in the High Institute of Infertility Diagnosis and Assisted Reproductive Technologies/Al-Nahrain University, from September 2019 to March 2020. The study included a total of 60 women who attended the infertility clinic of High Institute of Infertility Diagnosis and Assisted Reproductive Technologies/Al-Nahrain University from September 2019 to March 2020. All couples subjected to a full history taking, complete general examination, complete gynecological examination and infertility workup including: husband’s seminal fluid analysis, basal hormonal analysis, uterine cavity assessment by ultrasound and tubal patency evaluation by hystrosalpingogram. The females were divided into two groups each consisting of 20 females. 20 females were stimulated with clomiphene citrate + gonadotropin and other 20 were stimulated by letrozole + gonadotropin. The ovarian stimulation protocol was chosen for each patient according to the following criteria: age, history and hormonal assay.

Evaluation of thickness and pattern of endometrium, size and number of mature follicles was performed by transvaginal ultrasonography in the 2nd day of menstrual cycle and cycle day 11-14 before HCG injection (ovulatory phase). Pregnancy outcome was used as a main comparative parameter between selected groups.

Ethical Approval: Written informed consent was given to every patient included in this study gave her written informed consent before taking part in the study, it was approved by the Ethics Committee and according to questionnaire forms designed.

History: The history was used to identify variables that affect the outcome of the ovarian induction program. The following variables were chosen for the initial analysis: age, type of infertility (primary or secondary), duration of infertility, menstrual history, any previous pregnancies, details about frequency of intercourse, use of vaginal douches after intercourse, and presence of any sexual dysfunction, chronic illnesses, surgery, and fertility investigations and or treatment. Etiology of infertility (unexplained infertility, male factor, minimal to mild endometriosis or ovarian dysfunction

Physical Examination: From external appearance of the patient obesity or low weight, acne or increased facial hair which may be a result of androgen excess. The thyroid gland was examined, abdominal examination for any surgical scars, mass and striae (Tkaczk-Wlachet al., 2016). Gynecological examination was performed through vaginal examination to exclude any palpable pelvic mass or discomfort, normal vagina and cervix, the size, shape, position and mobility of the uterus was assessed.

Hormonal Analysis: In ART, correct diagnosis of the cause of infertility is a pre-requisite to successful treatment. Hormone tests are essential monitoring tools which were done in this study. In this study basal hormonal analysis was performed to all females included in the study on the 2nd or 3rd day of the menstrual cycle before starting control ovarian hyperstimulation COH. These hormones include FSH, LH, Prolactin, E2, and progesterone. Blood samples were drawn from each patient (5ml) for hormonal assay, from median cubital vein by disposable syringe (Becton Dickinson company, USA), into a plain tube (AFCO, Jordan) allowed to clot for 30 minutes and centrifuged at 3500 rpm within 10 minutes to separate the serum by using hormone analyzer.

Hysterosalpingography: Tubal patency and uterine cavity regularity were confirmed by hysterosalpingography, women with defective tubal patency or cavity deformity were excluded from the study.

Induction of Ovulation: Twenty females were treated by Clomiphene Citrate (CC) (Clomid, 50 mg/ tablets, Aventis Company, France) two times daily for five days from day two of menstrual cycle after basal transvaginal ultrasound to sixth day. Follitropin Alfa ampoules 75 IU, subcutaneous, from the 7th day of menstrual cycle and the dose was adapted according to the ovarian response to the dose of treatment. Other twenty females were treated with Femara (Letrozole) [Novartis] Film-coated tablets contain 2.5 mg Letrozole two times daily for 5 days from second day of menstrual cycle it is used to treat failed multiple cycles with ovulation induction by clomiphene citrate as used by other investigators. Follitropin Alfa ampoules 75 IU, subcutaneous, from the 7th day and the dose was adapted according to the ovarian response. Endometrial wash done at day of trigger for hyaluronic acid assessment.

Results

In this study, the majority of women enrolled in this study belonged to rural area and below 30 years, parity below 1 and infertile between 2-4 years, as shown in Table 1.
The study showed that the highest mean of LH (in the day of triggering of the follicle) was recorded in women under Clomid + FSH treatment (13.52±7.22 mlU/ml) followed by the control group (10.1±4.21 mlU/ml) and the lowest mean was in women received Letrozole+FSH (8.67±4.54 mlU/ml). The study also demonstrated that the mean of E2 was elevated significantly in women under Clomid + FSH treatment (280.5±191.4 pg/ml) followed by in women received Letrozole+FSH (214.2±141.4 pg/ml) and the lowest mean was in the control group (164.7±102.7 pg/ml). The maximum mean of progesterone was recorded in in women under Clomid + FSH treatment (4.15±3.2 ng/ml) followed by women received Letrozole+ FSH and the control group (Table 2).

Table 2: Levels of LH and E2 and progesterone among the study groups

<table>
<thead>
<tr>
<th>Mean±SD of hormones in day of triggering of the follicle</th>
<th>Women under ovulation stimulation programs</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Women under ovulation stimulation programs</td>
<td>P. value</td>
</tr>
<tr>
<td></td>
<td>Group A (Received Letrozole + FSH)</td>
<td>Group B (Received Clomid + FSH)</td>
</tr>
<tr>
<td>LH (mlU/ml)</td>
<td>8.67±4.54</td>
<td>13.52±7.22</td>
</tr>
<tr>
<td>E2 (pg/ml)</td>
<td>280.5±191.4</td>
<td>214.2±141.4</td>
</tr>
<tr>
<td>Progesterone (ng/ml)</td>
<td>4.15±3.2</td>
<td>2.73±1.01</td>
</tr>
</tbody>
</table>

P. value (≤0.05: Significant) (>0.05: Non-significant)

The study demonstrated that 55% of infertile women became pregnant one month after receiving letrozole + FSH and 50% of group B after receiving Clomid+FSH compared by 45% of the control group, although the result was non-significant (Table 3).

Table 3: Pregnancy rate in the studied groups

<table>
<thead>
<tr>
<th>Pregnancy after stimulation</th>
<th>Women under ovulation stimulation programs</th>
<th>Group A (Received Letrozole + FSH)</th>
<th>Group B (Received Clomid + FSH)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Positive</td>
<td>11</td>
<td>55</td>
<td>10</td>
</tr>
<tr>
<td>Negative</td>
<td>9</td>
<td>45</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100</td>
<td>20</td>
</tr>
</tbody>
</table>

X²: 0.4 P. value: 0.81 (Non-significant)
The study revealed that 36.36% of infertile women became with 2 follicles after receiving letrozole + FSH and 27.28% were with 3 follicles, while 50% of infertile women became with 2 follicles after receiving Clomid + FSH and 30% were with 1 follicle (Table 4).

**Table 4: Number of follicles in the studied groups**

<table>
<thead>
<tr>
<th>No. of follicles</th>
<th>Women under ovulation stimulation programs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group A (Received Letrozole + FSH)</td>
<td>Group B (Received Clomid + FSH)</td>
</tr>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11</strong></td>
<td><strong>10</strong></td>
</tr>
</tbody>
</table>

$X^2: 6.7$ P. value: 0.31 (Non-significant)

**Table 5: Level of hyaluronic acid in the studied groups**

<table>
<thead>
<tr>
<th>Hyaluronic acid (pg/ml)</th>
<th>Women under ovulation stimulation programs</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group A (Received Letrozole + FSH)</td>
<td>Group B (Received Clomid + FSH)</td>
</tr>
<tr>
<td>No.</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>(Mean±SD)</td>
<td>158.7±19.7</td>
<td>160.8±13.5</td>
</tr>
</tbody>
</table>

The study showed that mean of hyaluronic acid was elevated significantly in women received letrozole plus FSH (158.7±19.7 pg/ml) followed by women received Clomid plus FSH (160.8±13.5 pg/ml).

**Discussion**

In this study, the majority of women enrolled in this study belonged to rural area and below 30 years, parity below 1 and infertile between 2-4 years. These findings were close to that reported by Ahmeid(7), who found that the mean age of women under IVF was 30.36 year, his study also found that the mean of BMI was 25.9 (kg/m$^2$). Hameed and Ahmeid, (8) in recent study included 45 women who enrolled in ART programs in infertility center for in-vitro fertilization (IVF) and found that the mean age of infertile women was (31.80 ± 5.38 years), his study also found that the mean of BMI was 25.36 ± 1.99 (kg/m$^2$). Moreover Al-Dujaily et al(9) found that the mean age of infertile women (31.0 year) and BMI 25.3 (kg/m2) Due to body mass index (BMI) has an adverse effect on reproduction, a higher incidence of menstrual dysfunction and anovulation was found in overweight women, possibly because of the alteration in secretion of gonadotropin releasing hormone, sex hormone binding globulin, adrenal and ovarian androgen, and luteinizing hormone and also because of altered insulin resistance(10). Being a cheap, safe, and reasonably effective drug; Clomiphene citrate (CC) has withstood the test of time despite its all drawbacks. Therefore, the use of other protocols of ovulation induction in PCOS, including letrozole, has been limited to cases of CC resistance, failure, or intolerance (11). Effectiveness and cost-effectiveness of other protocols were also compared to CC. This approach is rational when costly, hazardous, or invasive interventions like gonadotropin stimulation or laparoscopic ovarian drilling (LOD) are considered (1). Letrozole, however, is similarly safe, relatively inexpensive, and reasonably effective drug. The drug, therefore, deserves a fair comparison with CC. Letrozole was the first aromatase inhibitor to be used for this indication. Studies on letrozole were mostly conducted on clomiphene resistant cases, and
because of its short history in this respect, concepts like letrozole resistance (12). The largest study comparing Clomiphene citrate to Letrozole was by Badawy et al. (13) demonstrated that the mean of E2 was significantly elevated in women under Clomid comparing with women who received Letrozole. Ibrahim et al. (14) also demonstrated that serum estradiol was significantly greater in the CC group. In an agreement with this study finding, Wu et al. (11) showed no significant difference in pregnancy rates and ovulation was found between the two drugs. Ibrahim et al. (14) also demonstrated that the clinical pregnancy rate was significantly higher in letrozole group (23.07 vs 10.68 %, P < 0.001). There was significant increase in endometrial receptivity in letrozole group as assessed by endometrial thickness and Doppler flow indices of uterine and subendometrial vessels statistically. No harmful side effects were reported in either group. Moreover, Majeed (15) proposed that, Letrozole appears to be a suitable ovulation inducing agent in PCOS women with CC failure and a significant higher pregnancy rate was observed in letrozole co treatment with gonadotropins. The finding of current study was also a good agreement with previous reports which conclude that letrozole has a better ovulation and pregnancy rate in patients with PCOS (16,17). Letrozole administration in early follicular phase blocks estrogen syntheses, and causes temporary accumulation of androgens in ovarian follicles, the accumulation of androgens may increase the sensitivity of the growing follicles to FSH by increasing the expression of FSH receptors (13). In addition, Dehbashi et al. (4) showed that no significant increase in pregnancy rate was observed in the letrozole group. A non-significant increase in pregnancy rate was observed in patients receiving the letrozole treatment (10). Moreover, Sammour et al. (18) concluded that the pregnancy rate per cycle was 11.5% in the letrozole group and 8.9% in the clomiphene group (similar pregnancy rate) in they studied total 238 cycles of IUI and superovulation in women with idiopathic infertility. Patients were randomized to receive 7.5 mg of letrozole or 100 mg of clomiphene daily. There was no significant difference between the total number of developing follicles in both groups the letrozole (5.7±3.7) and in the clomiphene groups (4.8±2.3).

Conclusions

It was concluded that, the number of follicles, Hyaluronic acid concentration, and the mean of Estradiol2 level at the day of trigger elevated significantly in women received letrozole than clomiphene as a treatment for non ovulatory infertility in women, and the pregnancy rate also is higher in letrozole plus gonadotropin group.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Al-Nahrain University and all experiments were carried out in accordance with approved guidelines.

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Characterization and Outcome of Patients Presented with Unilateral Nasal Disease to ENT unit at Hillah, Iraq

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Abstract

Background: A common finding during daily otolaryngological practice is a patient with unilateral nasal symptoms, nasal polyp or mass. The causes behind most cases of unilateral nasal disorder are inflammatory in nature and responds well to medical intervention and rarely there is need for surgical management. The possibility of neoplastic nature is high when there is unilateral nasal complaint or pathology as neoplastic conditions during their early stages may mimic inflammatory pathologies.

Aim of the Study: The aim of the current study was to highlight the causes of unilateral nasal disease, their most frequent mode of presentation, management strategies and outcome in a sample of Iraqi patients.

Patients and Method: The current prospective study included 96 patients, 42 males and 54 females, with signs and symptoms suggestive of unilateral nasal disease. The study was carried out at Hillah General Teaching Hospital, Babel province, mid-Euphrates region of Iraq and the work with this study has extended from January 2014 to August 2019. All enrolled patients were subjected to routine ENT examination and office flexible endoscopy. Patients were managed by functional endoscopic sinus surgery for purpose of excisional or incisional biopsy.

Results: The current study included 96 patients with a mean age of 49.09± 7.43 years and an age range of 39 to 67 years. There were 42 males and 54 females. The resultsof complete evaluation have shown the following pathologies at the end of the study: nasal polyposis (31, 32.3 %), chronic rhinosinusitis without polyp (16, 16.7 %), antrochoanal polyp (14, 14.6 %), inverted papilloma (11, 11.5 %), frontoethmoidal mucocele (7, 7.3 %), concha bullosa (4, 4.2 %), squamous cell carcinoma (3, 3.1 %), rhinolith (2, 2.1 %), fibrous dysplasia (2, 2.1 %), adenocarcinoma (2, 2.1 %), malignant melanoma (1, 1.0 %), cavernous hemangioma (1, 1.0 %), pyocele in concha bullosa (1, 1.0 %) and non Hodgkin’s (1, 1.0 %). Therefore, in the current study, nasal polyposis was the commonest cause of unilateral sinonasal disease followed by chronic rhinosinusitis without polyp, antrochoanal polyp and inverted papilloma. The rate of malignant neoplasms was low.

Conclusion: Differentiating the neoplastic nature form non-neoplastic nature of unilateral nasal pathology is the most critical management step and in the current study, nasal polyposis was the commonest cause of unilateral sinonasal disease followed by chronic rhinosinusitis without polyp, antrochoanal polyp and inverted papilloma. The rate of neoplastic malignant conditions was low.

Keywords: Unilateral nasal poly, Hillah, Iraq.

Introduction

A common finding during daily otolaryngological practice is a patient with unilateral nasal symptoms, nasal polyp or mass. The causes behind most cases of unilateral nasal disorder are inflammatory in nature and responds well to medical intervention and rarely there is need for surgical management. The possibility of neoplastic nature is high when there is unilateral nasal complaint or pathology as neoplastic conditions during their early stages may mimic inflammatory pathologies.
Actually, the mission of an otolaryngologist is to discover neoplastic conditions in association with unilateral nasal complaint in order to offer the best management options that can assure cure with high rate\(^1\). Despite the fact that unilateral nasal complaint is a frequent finding in daily clinical practice, literature dealing with the characterization and outcome of these conditions is relatively scanty\(^1,4-6\).

Unilateral nasal discharge, nasal congestion and nose bleeding in addition to dysosmia, migrane, and facial swelling are most common presenting clinical complaints in patients with unilateral nasal disease (7-9). Clinical characterization of a patient complaining of single-sided nasal symptoms mass is an essential challenging health issue because they are often accompanied by multifactorial underlying etiology (1, 8, 9). Evaluation of such health issue should include good history taking, thorough local examination and endoscopic investigation in addition to radiologic evaluation (1, 7). Findings on imaging play a significant role in the diagnosis and workup of sinonasal pathology. Bilateral versus unilateral involvement is a key feature that can differentiate between different etiologies (10).

The poverty of national and international publications dealing with clinical presentation and pathologic characterization of unilateral nasal complaint justified the planning and conductance of the current study in Hillah General Teaching Hospital, mid-Euphrates region of Iraq.

**Patients and Method**

The current prospective study included 96 patients, 42 males and 54 females, with signs and symptoms suggestive of unilateral nasal disease. The study was carried out at Hillah General Teaching Hospital, Babel province, mid-Euphrates region of Iraq and the work with this study has extended from January 2014 to August 2019. All enrolled patients were subjected to routine ENT examination and office flexible endoscopy. Patients were managed by functional endoscopic sinus surgery for purpose of excisional or incisional biopsy.

The ethical approval was issued by the ethical approval committee of the local health institute and a verbal consent was obtained from all participants following full illustration of the aim and the procedure of the study. The principal outcomes were the clinical presenting features and the type of pathology.

Data were transformed into SPSS (statistical package for social sciences) software (IBM, Chicago, USA, version 23) for purpose of statistical description. Categorical variables were expressed as number and percentage, whereas, quantitative data were expressed as range, mean and standard deviation.

**Results**

The current study included 96 patients with a mean age of 49.09± 7.43 years and an age range of 39 to 67 years. There were 42 males and 54 females. The results of complete evaluation have shown the following pathologies at the end of the study: nasal polyposis (31, 32.3 %), chronic rhinosinusitis without polyp (16, 16.7 %), antrochoanal polyp (14, 14.6 %), inverted papilloma (11, 11.5 %), frontoethmoidal mucocele (7, 7.3 %), concha bullosa (4, 4.2 %), squamous cell carcinoma (3, 3.1 %), rhinolith (2, 2.1 %), fibrous dysplasia (2, 2.1 %), adenocarcinoma (2, 2.1 %), malignant melanoma (1, 1.0 %), cavernous hemangioma (1, 1.0 %), pyocele in concha bullosa (1, 1.0 %) and non Hodgkin’s (1, 1.0 %). Therefore, in the current study, nasal polyposis was the commonest cause of unilateral sinonasal disease followed by chronic rhinosinusitis without polyp, antrochoanal polyp and inverted papilloma. The rate of malignant neoplasms was low, as demonstrated in figure 1.

The presenting clinical features are shown in figure 2. The most frequent clinical symptom was nasal obstruction which was seen in 81 cases (84.4 %), followed by rhinorrhea (69 cases, 71.9 %), then postnasal drip (33 cases, 34.4 %) and anosmia (23 cases, 24.0 %). Other manifestations included: epistaxis, facial pain, otologic symptom, visual problem and toothache in 8 (8.3 %), 8 (8.3 %), 4 (4.2 %), 3 (3.1 %) and 3 (3.1 %), respectively.

The radiological findings of some patients have been demonstrated in figures 3 through 5.
Figure 1: Bar chart showing the frequency distribution of patients with unilateral nasal disease according to etiology.

Figure 2: Bar chart showing the frequency distribution of patients with unilateral nasal disease according to clinical features.
Figure 3: Computed tomogram findings in a patient with unilateral chronic rhinosinusitis

Figure 4: Computed tomogram findings in a patient with unilateral nasal polyposis
Figure 5: Axial view patient with unilateral nasal disease

Figure 6: Computed tomogram findings in a patient with antrochoanal polyp
Discussion

One of the frequent presenting features of patients visiting ENT units is the complaint of unilateral nasal problems. Indeed, it is a challenging presentation to the ENT specialist because of the high possibility of a neoplastic disorder to be seen in association with unilateral nasal presentation than with bilateral nasal presentation; however, overall, the proportion of neoplastic disorders is low in either presentation 11,12.

In the current study, which has extended for more than 3 years, we were able to categorize 96 patients with unilateral nasal disease. The most frequent pathologies were nasal polyposis, chronic rhinosinusitis without polyp, antrochoanal polyp and inverted papilloma. In order to accomplish this mission, we followed the rule of comprehensive clinical evaluations of patient’s age, presenting clinical features, examination using nasoendoscopy, and radiological investigations, computed tomography (CT) in particular. In accordance with current study findings, it has been stated that the majority of pathologies in the sinonasal region are reactive inflammatory disorders and that the minority of them are neoplastic disorders 12.

The problem with neoplastic malignant sinonasal pathologies is that they mimic inflammatory disorders in their early stages, so that the diagnosis of these disorders is often made late. Delay in the diagnosis of such malignant disorders is usually accompanied by poor prognosis; therefore, meticulous evaluation of unilateral nasal presentations is of prime importance to exclude malignant neoplastic disorders 1.

With respect to age, benign neoplasms are often seen in children and young adults (1). The average age at time of detecting unilateral choanal polyps is around 27 (13). Fifth to 7th decade is the usual time for detecting neoplastic disorders in patients with sinonasal disorder with a male predominance and low socioeconomic status 14. Indeed, one of principal observations in the current study was that males were more often affected by neoplastic disorders than women and that inflammatory conditions were mainly seen in younger patients.

A variety of clinical manifestations are associated with unilateral nasal lesions, such as nasal discharge, nasal obstruction, anosmia, headache and epistaxis. In the current study the major presenting symptoms in order of frequency were nasal obstruction which was seen in 81 cases (84.4 %), followed by rhinorrhea (69 cases, 71.9 %), then postnasal drip (33 cases, 34.4 %) and anosmia (23 cases, 24.0 %). These findings are approximately the same as the findings of previous authors 1.

Facial pain, dental complaint and visual and otologic manifestation have also been seen in our study in accordance with previous observations made by several authors 1,4.

Comprehensive understanding of intranasal structure and characterization of intranasal pathologies have been made easy and amenable following the introduction of nasal endoscopy 1. Therefore, in the current study, the use of nasal endoscope provided both diagnostic and therapeutic tool since a number of conditions were treated by total excision of nasal pathology. The nasal mass lesions may be seen as single of multiple masses, sessile or pedunculated polyps.

Inflammatory conditions like acute and chronic CRS, either from bacterial or fungal origin were the commonest histopathological diagnosis in our study. Inflammation was the commonest form of nasal pathology in the current study and this is in accordance with previous reports 1. In our study, the commonest benign neoplasm was inverted papilloma (11.5 %) and this finding is supported by previous similar findings 1,15. On the other hand, the most common malignant neoplasm in our study was squamous cell carcinoma which is the same observation as the observation of some previous authors 1,16. In our study, a single case of Non-Hodgkin lymphoma was identified. Previous studies have also documented the rarity of Non-Hodgkin lymphoma in this clinical setting 1,17.

Conclusion

Differentiating the neoplastic nature form non-neoplastic nature of unilateral nasal pathology is the most critical management step and in the current study, nasal polyposis was the commonest cause of unilateral sinonasal disease followed by chronic rhinosinusitis without polyp, antrochoanal polyp and inverted papilloma. The rate of neoplastic malignant conditions was low.

Acknowledgement: We would like to express our deep thanks to all patients who participated in the current study to be a baseline report about the anatomical and the pathological presentation of unilateral sinonasal disease in Iraq.
Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Surgery and all experiments were carried out in accordance with approved guidelines.

References


Genetic Mutation Detection of IL-4 Gene in Patients with a Topic Dermatitis in Iraq Population

Aseel Kasim Kareem¹, Alaa Jawad Hassan²

¹Lecturer, Department of Biology, College of Science, University of Babylon, Iraq, ²Prof. Dr., Department of Biology, College of Science, University of Babylon, Iraq

Abstract

The aim of this study is to detect mutation in IL4 gene in atopic dermatitis patients in Babylon province, Iraq. The current study was performed on (50) Samples of patients with atopic dermatitis and 40 samples represents healthy subjects as control group, their ages ranged between 1-20 years old. The results of the PCR, with newly designed primers, showed 502bp amplicon as well as there were no mutations detected in nucleotide sequences for all samples including control. Therefore, when compare the results of identity for any isolate; it was appeared that there are no differences in nucleotides sequences and atopic dermatitis is not necessarily associated with IL4 gene mutation.

Keywords: IL4 gene, atopic dermatitis, PCR, sequencing.

Introduction

As a common chronic skin disease, atopic dermatitis (AD) affects over 20% of children with stress and economic impact on the family¹,². The first step in the prevention and treatment is to investigate the etiological factors of AD because it has multifactorial mechanisms including personal and environmental factors like food and environmental allergens as strong factors during youngest age³. Polymorphisms of various immune pathway genes are associated with an increased risk of AD through alternations in the T-helper type 2 signaling pathway⁴. Up regulation of certain interleukin (IL-4 and IL-13) lowers FLG expression, which leads to skin barrier defects, furthermore, a gain of functional polymorphisms of Th 2 cytokine receptors IL-4R and IL-13R are also implicated in AD pathogenesis⁵,⁶. Additionally, the expression/immune expression level of IL-4 is functionally dependent on genetic variants of IL-4 (SNP). In light of the association studies, it can be hypothesized that some IL-4 SNPs may lead to an overexpression of IL-4 gene and thus influence the immunological reaction⁷. Therefore, the aim of current study was to determine the association between IL4 gene mutation and AD.

Materials and Method

Collection of blood samples: About 2ml of venous blood was collected directly in EDTA tubes from 50 patients with AD and 40 healthy persons.

DNA extraction and purification: DNA was extracted from patients and control individuals using genomic DNA extraction blood DNA Mini Kit (Favorgene, Korea). The DNA concentration and purity at 260/280 nm were measured using Nano Drop spectrophotometer (OPTIZEN POP, Korea). DNA was stored at -20°C till use.

Primer design and PCR: PCR Primer (F: 5’-GAAACCTCAGAATAGACCTACC-3’) and (R: 5’-TGTCCTGTGAAATCAGACC-3’) were designed from the sequences reported (GenBank accession No. BC022894.1) in order to amplify a 502bp fragment of the IL4 gene. The PCR reaction consisted of 5µl DNA, 12.5µl 1X Master Mix (Promega), 2µl of 10pmol
of each specific primer (Macrogen, Korea) and the volume completed to 25µl by DNase free water. The PCR reaction was performed according to conditions mentioned in Table (1).

Electrophoreoses was accomplished using 1.5% agarose gel, stained with ethidium bromide, for 45min at 75 volt then, viewed by UV transilluminator and photographed.

DNA sequencing: Sequence similarity was accomplished using the forward primer previously designed through sequence alignment using BLASTN 2.2.27+ program.

Results

The results show that the presence of a single band (502bp) of the target sequence of IL4 gene (Fig. 1). The sequencing data for samples that takes from the same product of PCR were revealed the heterozygous among patients in location \(-11903\) of the samples A5 & A8 (TC), whenever the risk factor is C allele for the disease, but for the samples A7 & A9 the homozygous were (TT) as shown in Table (2) and Figure (2).

Also The results of samples for product of PCR amplification that sent to Sequencing reading appeared the frameshift mutation (deletion) of thymine base in location \(-12259\) in regulatory area of IL4 gene and this mutation is recorded in the NCBI data base with accession number as shown in Figure (3). From the results, this mutation might have an effect on gene expression level and as a result on disease severity.

**Table 1: The cycling condition of IL4 gene**

<table>
<thead>
<tr>
<th>Steps</th>
<th>Temperature</th>
<th>Time</th>
<th>No. of Cycles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre- denaturation</td>
<td>94°C</td>
<td>1 min</td>
<td>1</td>
</tr>
<tr>
<td>Denaturation</td>
<td>94°C</td>
<td>45 sec</td>
<td>30</td>
</tr>
<tr>
<td>Annealing</td>
<td>60°C</td>
<td>30 sec</td>
<td></td>
</tr>
<tr>
<td>Extension</td>
<td>72°C</td>
<td>1 min</td>
<td></td>
</tr>
<tr>
<td>Final Extension</td>
<td>72°C</td>
<td>5 min</td>
<td></td>
</tr>
<tr>
<td>Hold</td>
<td>4°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: Identity of IL4 gene sequences with reference sequence [AF395008.1]**

<table>
<thead>
<tr>
<th>Code</th>
<th>Allotype</th>
<th>Query Cover.</th>
<th>Ident.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A5</td>
<td>Heterozygous at position (-11903)</td>
<td>100%</td>
<td>99%</td>
</tr>
<tr>
<td>A7</td>
<td>Homozygous</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>A8</td>
<td>Heterozygous at position (-11903)</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>A9</td>
<td>Homozygous</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Figure 1: Electrophoresis patterns of PCR product 502bp for IL4 gene loci, lane M DNA 100bp marker, lane 1- 10 PCR product of patient, lane 11-16 PCR product of control, 1.5 % agarose, 75 V, 20 Am for 45 Minutes. (10µl in each well)**
Discussion

The current study agreement with Malaisse et al.,(2014) whom noticed the IL4 promotes that development of atopic diseases through effects on multiple cell types. Despite its critical role in AD, how IL4 alters gene expression in keratinocytes has not been completely defined. In this report its used high-throughput transcriptomic analysis to identify IL4 induced changes in keratinocyte gene expression at early and late stages of differentiation.
Acute and chronic IL4 stimulation resulted in extensive changes in gene expression profiles that spanned a variety of functional modules, including wound healing, a biological response impaired by IL4.

The results of heterozygous (TC) for IL4 gene using sequencing technique when the C allele that represented risk factor for disease disagreement with Zahran et al. (2013) that conclusion, the IL4 gene polymorphism (C-590T) had no relationship with the development of both types of dermatitis, but the C allele was risk factor for disease.

**Conclusion**

There were many mutations detected in nucleotide sequences for all samples including control. Therefore, when compare the results of identity for any sample; it was appeared that there are many differences in nucleotides sequences and atopic dermatitis is necessarily associated with IL4 gene mutation.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Biology and all experiments were carried out in accordance with approved guidelines.

**References**

The Accuracy of Computed Tomography in Blunt Abdominal Trauma in Unusual Times

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¹Assist. Prof., Department of General Surgery, College of Medicine, University of Thi-Qar, Iraq

Abstract

Background: A potential research for the evaluation of CT scan accuracy in blunt abdominal trauma was carried out by comparing operative and CT scan observation. About 60 patients undertook the blunt abdominal trauma in three years. CT scan was performed on these stabilized patients for its further comparison with operative results. Moreover, all the documented data comprised of scan results, sex, age and type of injuries.

Aim of Study: The objective of our current research was to discover the accuracy of CT scan results for blunt abdominal trauma which was evaluated by surgeons in duty compare with operative findings.

Results: From 60 patients, 40 pts (66.6 %) underwent surgery. 20 pts (33.3%) were conservatively managed. 5 pts were died. Hemoperitoneum was perceived in fifty five patients. The patients having little hemoperitoneum on CT scan along with reasonable clinical observations were conventionally managed whereas those patients having huge hemoperitoneum needed surgical investigation. Out of all the patients involved in study, 13 had splenic, 3 pancreatic, 15 hepatic, 4 vascular and 5 renal injuries, however, 12 showed retroperitoneum hematoma.

Conclusion: In comparison between clinical monitoring, CT in the evaluation of blunt abdominal trauma with accuracy 86-100% (over all accuracy 94%).

Keywords: Computed Tomography; Blunt Abdominal Trauma.

Introduction

The abdominal trauma is categorized in penetrating and blunt kinds. The penetrating abdominal trauma (PAT) is frequently diagnosed on the basis of clinical symptoms. Whereas, the blunt trauma get missed or postponed due to unclear clinical signs.[1]

Thus, it can create problems for individuals of all ages. The recognition of severe intra-abdominal pathology is sometimes perplexing as it is difficult to acknowledge various injuries in initial evaluation and treatment [2].

Diagnosis: The most significant concern in evaluating the blunt abdominal trauma is the estimation of hemodynamic stability [3]. Moreover, a quick estimation for hemodynamically unstable patients can be achieved with FAST (Focused assessment with sonography trauma) and diagnostic eitoneal lavage (DPL) for hemoperitoneum evaluation. The inconvincible physical examination results leads to the abdominal radiographic studies of stable patients[4,5].

FAST: The FAST examination done in 4 windows of ultrasound: (perihepatic, pelvic, pericardiac, perisplenic) along with the supine patients to detect free fluid or bleeding in any of this 4 windows (2,3,4,5)

Computed Tomography: The outcomes of CT scans are essential for solid organ injuries’ detection such as liver, kidneys, spleen, as well as for retroperitoneum involving colorectum, pancreas, bladder, diaphragm, and small bowel [6].Likewise CT scan can further expose other related injuries for instance, thoracic cavity injuries, vertebral and pelvic fractures as well.

Scans illustrate brilliant imaging for genitourinary system, pancreas and duodenum by revealing blood quantity in abdomen & precisely each individual organ.
But it has some limitations such as marginal sensitivity for hollow viscous, pancreatic and diaphragmatic injuries’ diagnosis. These are also considered as costly, time taking and need oral or intravenous contrast which may lead to the severe reactions [7,8].

Thus, the CT scans in contrast to the FAST and DPL investigation have capacity for the haemorrhage source determination. Besides this, various retroperitoneal injuries get ignored with DPL & FAST evaluation [9].

Figure 1. Blunt abdominal trauma. Right kidney injury with blood in perirenal space. Injury resulted from high-speed motor vehicle collision.

Method

This prospective study, done in Al Hussain Teaching Hospital in Nassyriah IRAQ during 3 years (from January 2012 to December 2014), used abdomen CT scan to assess abdominal blunt trauma to most stable patients arrived emergency room in holidays and daily after 10 pm till morning by surgeon in duty and technician (because unavailable radiologist at hospital at this time).

About sixty stabilized blunt abdominal trauma patients went through this examination. The patients included 36 males (60%) and 24 females (40%). The age range was 7 – 68 years.

Clinical examination and diagnostic peritoneal tapping was done for most of them. The patients who weren’t admitted or the ones who got discharged after short examination were devoid of any more investigation were omitted from our research.

We are usually looking for any hemoperitonium and solid organ injuries. Hence, the CT of hemoperitoneum was categorised as defined by Federle and Jeffrey et al.[10]

- Fluid in one space = Small (100-200 cc)
- Fluid in tow spaces or more = Moderate (250-500cc)
- Fluid in all spaces or pelvic fluid anterior\superior tourinary bladder = Large ( > 500 cc)

The Organ Injury Scale (OIS system) was used to grade the solid organ injuries. from simple organic contusion grade I to avascularisation of one organ grade V., then these CT observations were related to the operative discoveries of forty patients who underwent explorative laprotomy.

Results

Most of patients involved in this study whom
suffering from abdominal trauma are male, the Male:female ratio is 1.5:1 look table 2 they extend from different age groups ranging from 7 years to 64 years.

Table 1. Explain the Gender ratio, mode of injury, operative and conservative management, and organs injuries.

<table>
<thead>
<tr>
<th>Gender</th>
<th>No of patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>36</td>
<td>60%</td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td>40%</td>
</tr>
</tbody>
</table>

Mode of injury

<table>
<thead>
<tr>
<th>Cause of abdominal trauma</th>
<th>No of patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTA</td>
<td>48</td>
<td>80%</td>
</tr>
<tr>
<td>fall from height</td>
<td>4</td>
<td>6.7%</td>
</tr>
<tr>
<td>Fighting</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Animal trauma</td>
<td>2</td>
<td>3.3%</td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
<td>5%</td>
</tr>
</tbody>
</table>

Operative and conservative management

<table>
<thead>
<tr>
<th>Management</th>
<th>No of patients</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underwent surgery</td>
<td>40 patients, (66.6%)</td>
<td>4</td>
</tr>
<tr>
<td>Conservatively managed</td>
<td>20 (33.3%) patients</td>
<td>1</td>
</tr>
</tbody>
</table>

Organs injuries

<table>
<thead>
<tr>
<th>Organ injuries</th>
<th>No of patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liver</td>
<td>15</td>
<td>37.5%</td>
</tr>
<tr>
<td>Spleen</td>
<td>13</td>
<td>32.5%</td>
</tr>
<tr>
<td>Kidney</td>
<td>5</td>
<td>12.5%</td>
</tr>
<tr>
<td>Bowel &amp; mesentry</td>
<td>5</td>
<td>12.5%</td>
</tr>
<tr>
<td>Pancrease</td>
<td>3</td>
<td>7.5%</td>
</tr>
<tr>
<td>Vascular injuries</td>
<td>4</td>
<td>10%</td>
</tr>
<tr>
<td>Urinary Bladder</td>
<td>4</td>
<td>10%</td>
</tr>
<tr>
<td>Stomach</td>
<td>2</td>
<td>5%</td>
</tr>
<tr>
<td>Diaphragmatic rupture</td>
<td>1</td>
<td>2.5%</td>
</tr>
<tr>
<td>Retroperitoniumheamatoma</td>
<td>12</td>
<td>30%</td>
</tr>
</tbody>
</table>

The commonest mode of injury in blunt abdominal trauma, is RTA (road traffic accident) in 48 from 60 patients (80%). look table 1.

Another group with normal CT scan no collection no solid organ injury with stable general condition they discharge home this group not involve in this study

All the 9 patients with large Hemoperitoneum required surgical exploration., while All 10 patients with small fluid on CT scan started with conservative management in spite of one severely injury in head and chest, 3 of them (30%) deteriorated with in 24 hours of follow up.

The moderate fluid group indicated that thirteen (13) were conservatively managed who were stable general condition and the other 28 patients underwent surgical exploration that were either unstable haemodynamically and/or had deterioration of their conditions like unexplained abdominal rigidity, therefore, the explorative laparotomy’s rate in moderate hemoperitoneum patients was observed to be as 68% on CT scan as presented in table (2).

Table 2 (Hemoperitoneum was detected on CT)

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Conservative</th>
<th>Op</th>
<th>Op total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>10</td>
<td>7</td>
<td>3 out of 10</td>
<td>30%</td>
</tr>
<tr>
<td>Moderate</td>
<td>41</td>
<td>13</td>
<td>28 out of 41</td>
<td>68%</td>
</tr>
<tr>
<td>Large</td>
<td>9</td>
<td>0</td>
<td>9</td>
<td>100%</td>
</tr>
</tbody>
</table>

Most of patient who operated 25 patients from 40 was explored 62.5% have multiorgans injuries, and 12 patients 30% have single organ injured, another 3 patents only free fluid no solid organ injured . anyhow the commonest organ involved was the liver 15 out of 40 patients 37.5% and spleen 13 out of 40 patients 32.5% look table 1.

Figure 2. (23 years old man injured by RTA low speed vehicle injury of stomach)
About grading of solid organ injury is its difficult to assess by CT scan by non provisional person and without contrast, but during surgery we found different grading among patient, look table 1.

About accuracy of fluid collection the accuracy is 100 % all cases we positive in CT scan were positive in surgery, but some cases in CT looked mild collection while in surgery looked moderate or severe, but no false positive or negative

**Table 3. Show (Grade of solid organ, solid organ and other injuries CT scan findings vs operative findings, fluid collection CT scan findings vs operative findings)**

<table>
<thead>
<tr>
<th>Grade solid organ</th>
<th>Liver</th>
<th>Splenic</th>
<th>Kidney</th>
<th>Pancreatic</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>7</td>
<td>7</td>
<td>1</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>II</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>III</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>IV</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>V</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15</td>
<td>13</td>
<td>5</td>
<td>3</td>
<td>36</td>
</tr>
</tbody>
</table>

**Solid organ and other injuries CT scan findings vs operative findings**

<table>
<thead>
<tr>
<th>Findings</th>
<th>CT finding</th>
<th>Operative finding</th>
<th>False - ve</th>
<th>False + ve</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liver injuries</td>
<td>13</td>
<td>15</td>
<td>2</td>
<td>0</td>
<td>86%</td>
</tr>
<tr>
<td>Spleen injuries</td>
<td>11</td>
<td>13</td>
<td>2</td>
<td>0</td>
<td>84%</td>
</tr>
<tr>
<td>Kidney injuries</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Pancreas injuries</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>67%</td>
</tr>
<tr>
<td>Diaphragmatic rupture</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Retroperitonium haematoma</td>
<td>12</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Fluid collection CT scan findings vs operative findings**

<table>
<thead>
<tr>
<th>Findings</th>
<th>CT finding</th>
<th>Operative finding</th>
<th>False - ve</th>
<th>False + ve</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild fluid collection</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Moderate fluid collection</td>
<td>28</td>
<td>28</td>
<td>0</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Large fluid collection</td>
<td>9</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Discussion**

The primary inspection of abdomen can distinguish the major intra-abdominal haemorrhage symptoms. Whereas, the secondary investigation is important to spot a continuous bleeding or haemorrhage subsequent to the normal blood pressure restoration \[11\].

The blunt abdominal trauma patients lack the substantial physical symptoms of organ participation. In case of instability of patients having numerous injuries, there is an ambiguity about abdomen being a shock source, thus a FAST investigation might be helpful. In case of stabilized patient and easy approach to CT scan,
abdomen and head scan should be performed. The stable patients having several injuries including occult organ injuries which are not threat of life then CT estimation is essential.[12] in this study we start with clinical assessment of all patients had abdominal blunt trauma who arrived emergency room, the stable patients sent to CT scan assessment , if negative or minimal collection they treated conservatively and most of them go home so not involved in this study, but patents whom admit hospital for follow up 60 patients 40 from 60 patients, (66.6%) underwent surgery about, while 20 patients (33.3%) continue on conservative managed without any complications.

Most of patients involved in this study whom suffering from abdominal trauma are male, the Male :female ratio is 1.5 :1 look table 2 they extend from different age groups ranging from 7 years to 64 years.

The severe wound caused because of blunt force trauma are reliant on transferred kinetic energy amount and tissue whom energy is transmitted. Thus the kinetic energy is related to the object movement which is equivalent to the one half of the object mass while multiplying with the square of object velocity such as $\frac{1}{2}mv^2$. Therefore, generally, the lighter objects moving with a high speed are more dangerous as compared to the heavy object roving at lower speed. [1- 4] However, unluckily 5 patients expired and out of them two deaths were caused due to postoperative complications. But the other two deceased patients were associated with sever extra abdominal injuries within first 24 hours . there was one patient not operated because severely injured head and chest, and autopsy reveal no significant intra abdominal injuries so all deaths due to severity of trauma look table 1.

Haemodynamically, the CT accurateness in stabilized blunt trauma patients is well recognised. Moreover, among the patients of emergency CT, the specificity of about 98.7% while sensitivity of about 97% & 92% have been testified[13,14] which is near the range of this study table 9 accuracy for solid organs between 84 – 100 % median range may be because reading by surgeon in duty himself who is not provisional in radiology, and also not use contrast at this time of day but any how if compare its nearby, Various researchers endorse being admitted and observed subsequent to a negative CT[15,16]to repeat CT scan with or without contrast and reassessed by radiologist to exclude farther injuries as CT is particularly insufficient to diagnose the mesenteric wounds while it might skip some hollow visceral wounds. Thus, for the hollow visceral or mesenteric prone patients, the most suitable test is DPL [17]. And negative results of CT scan for these patients do not consistently eliminate the intra-abdominal wounds. So we depend on hemoperitoneum or fluid collection we found the accuracy of CT scan was 100%, the overall nine patients having great hemoperitoneum need surgical examination. Whereas, the group of moderate fluid have conservatively managed thirteen patients who were stable general condition and the other 28 patients underwent surgical exploration. More than 68% patients of moderate fluid were investigated. Taylor et al. presented a report of an experience of 50%[18] we think this relatively higher percentage because exclude most of stable patient with negative CT and stable those discharge on their responsibility and not involved in this study, and of course less experience of surgeon in CT scan assessment without contrast at night or holidays.

CT was executed in forty four haemodynamically stabilized patients of blunt trauma succeeding DPL by Kane. The scan of sixteen patients exposed an essential retroperitoneal or intra-abdominal wounds which DPL could not identify. Finally, the results of scans helped 58% patients in modifying the original plan of treatment.[19]

About grading of solid organ injury in this study we cannot assess by CT scan because lack of experience, but during surgery show a lot of patients have multi-organ injuries 25 from 40 patient was explored 62.5%, and 12 patents 30% have single organ injured, another 3 patients only free fluid no solid organ injured, the injured organs in different grades II, III, IV or V injuries they required surgery. While the rest of the injuries were managed conservatively, and according to follow up clinical finding if deteriorated go to surgery.

The high grade injury of solid organs upsurge the surgical management. While the low grade wounds were insufficient for management protocol prediction because some time hypo or hyper assessment of CT scan by surgeon.

**Conclusion**

We conclude that the CT scan is accurate test for diagnosis of intra-abdominal hemoperitoneum or fluid collections, and solid organ injury after blunt trauma and has all the attributes to make it an initial investigation of choice in haemodynamically stable patients even
done by surgeon in duty (but it’s better to be done with contrast and assessed by provisional radiologist) Thus, the negative laparotomy’s rate is decreased by abstaining from unnecessary surgical interference, also reduce missed injury by early discover of internal bleeding or organ injury in cases of conservative management.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Medicine and all experiments were carried out in accordance with approved guidelines.

References
Analysis and Compare of Cardiac Functional Efficiency Level and the Circulatory System for Short, Middle and Long-Distance Runners

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Assist. Lecturer, Al-Ayen University, Thi-Qar, Iraq

Abstract

The aims of this study are knowing of cardiac functional Efficiency level and circulatory system for the short, middle and long-distance runner and knowing the differences of the cardia physical efficiency level and circulatory system for the long-middle and shirt-distance runners. Thus, continuing of the sport training operation may lead to take place some of the physiological changes in body, as the track and field games is definitely distinguished that runners. The athletes may face a various kind of functional changes resulted by various training resilience. While the Heartbeat size increases with the physical efficiency level at the relation time. Thus, we may say that physical efficiency level increases and reflects with the Heartbeat increasing and lowering of the cardiac Heartbeat during relaxation. As the track and field races are dividing athletes into short, middle and long-distance runners. Generally, the athletes participating may face in various games, therefore, the research importance is based on knowing the cardia physical efficiency level and circulatory system for the short, middle long-distance runners, then attempting to know the best set in fitness in raspatory circulatory system among the athletes in these activities.

Keywords: Cardiac, Efficiency Level, Circulatory System, Distance Runners.

Introduction

The physical activity is deeply linking with the vital systems as it being an attempt to developing the individual capacities and progressing his aptitudes in order to achieve a better level in performance as well as creating the functional endurance for the human systems which is directly connected or indirectly with the present activity. One of the most important systems is circulatory system and respiratory. And the heart will be the main part of the circular system and the Heart activity of muscuarlr contraction and relaxation in succession. This succession in Heart activity will ensure the blood reaching to the veins and cardiccirculatory. It will contain contraction and relaxation. And a time of stopping of heart contraction, which is consequence tunes to relaxations of Atriums and Ventriclees, and stopping is the rest between the relaxation of Atriums and ventricles. The measures and functional tests are considered one of the most important factors which to accompany the treatment program. In order to ensure resilience training of for the runner and having the increasing resilience, either fix it or lesson it to be able by finding out any shortage unnormal in the normal state for the athlete at the beginning. Before is multiplied during the training process and increasing of resilience degree to the body, without noticing the healthy and functional training state. The means of the test and measure have been developed to include all the data of the athlete during relaxation time and at the physical resilience and later. And these tests and measures also provide to follow up the training runner state during the training seasons which makes is a precursor to prophecy of the an indicate do of better future level

The distinguished tests of the functional state for Heart and Circular system: The cardiac efficiency and circulatory system are considered of the important mark for the physical fitness. The cardiac functional and circularity system are based on the ability for this part. And this system in order to fill up the boys needs of
blood during exercises and ant ability to return back to the natural state after a short period of relaxation.

**Cardiac functional state and its relation to the physical ability:** The term of body efficiency is one of the greatly distributed terms in athletic physiology field and work. The experiments conclude that body efficiency is increased in level and connected with the circulatory system efficiency as the size of the Heartbeat is increased with the body efficiency level and reflected on the Heartbeat size increasing and lesson Heartbeat average during relaxation.

**Circulatory system:** The circulatory system is divided into two parts: the cardiac circulatory system which included the heart which is the main member and bloody lymph veins, and lymph glands so the heart circulatory system pushes the oxygen and various food material into the body cells. and at the same time attempting to get rid of $\text{CO}_2$.

Of $\text{CO}_2$ the remainmetabolism processs of the all human cells. It also provides transporting hormones from endocrine glands into its limited cells. This system also keeps the interior body heat degree at roughly (37$^\circ$C) and the ability to keep an amount of the liquids in body in order to save the body out of damage at the dryness state and help of saving from infections by germs and microbes which attack and occupied the body.

**Activities of Track and Field Games (Running):**

**Activities of Short- Distance:** Short-distance running is considered one of the activities which required a great amount of physical and psychological capacities. And the short -distance running is distinguished of being reliable of airless energy system in which the body woks during oxygen shortage. And the short-distance activities are considered of the activities which in excitement is important as it is distinguished of surprises. Thus, these activities are considered totally competing and not-entertainment (1). The short-distance activities are including competitions (100m, 200m, 400, 100 fences female. 110 fences male, 4100 m post, 400m post)

**Activities of middle-distance:** The middle- distance running is distinguished in the ongoing time with high acceleration performance level in the last years. The difficulty of trespassing the world numbers in this field is very hard to obtain, in order to reach to a higher level

The middle-distance runners is described of gathering amid the long-distance an short-distance runners (1). It included of the middle activities (800 m. 1500 m)

**Activities of Long-Distance:** These activities are named the long running distances or the endurance running. Thus, the higher rate of the values to ensuing the energy is oxygen rate is amount between (70-80)

The long -distance activities are considered of the simpler distances in the track and field games technically. The athlete can learn by himself as not need to the technical parts in the running performance and organize the respiratory operations with the step tunes. And this is an important operation so the athlete will not feel of tiredness (2) and the long -distance activities of (3000 m, 3000 fences, 5000 m, 10000 m).

**Research Method and its field measures:**

**Research Method:** The researcher used the description method of scanning style due being the best method and easily done in making the research aims

**Research Society:** The aims which the researcher may do for his research and the measures he used will repeat the sample nature which he has chosen (1) therefore the research society for the long, middle and short -distance runners as it is seen in the table 1.

<table>
<thead>
<tr>
<th>Statistics treatments-samples</th>
<th>Total number</th>
<th>Number which has been chosen</th>
<th>Percent values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short -distance runners</td>
<td>5</td>
<td>5</td>
<td>100%</td>
</tr>
<tr>
<td>Middle-distance runners</td>
<td>4</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td>Long-distance runners</td>
<td>4</td>
<td>4</td>
<td>100%</td>
</tr>
</tbody>
</table>
Instruments and the ways of data gathering

* Foreign and Arabic Resources.
* Cardiac functional measure state and circulatory system.
* tests and measure.

**Used Tests:**

Tests of functional state measure and circulatory system

**Test name:** Step test for Basra university.

**Reason for test:** Cardiac functional state measure and circulatory system

**Used instruments**

Stage at 15 inches
Instrument for record sounds
Result registration form

**Method of performance:** The student stands in the front of the device while he is holding the crossbar of the device. When the starting signal is given, the expert will climb on the right foot and then the left foot and then the right foot and then the left foot go down and the process of going up and down the foot is done according to the sound rhythm specified for that bump thus the performance continues until the end of time which is 3 minutes.

**Registration:**

Calculating performance seconds numbers
Calculating Heartbeat for 30 minutes period after giving the player a rest period for 30 minutes

**Evaluation:**

Player’s activity is evaluated according to following equation

**Player’s Efficiency:** performance seconds number \times 100

6.5 \times Heartbeat for 30 seconds

**Exploratory Experience:** The researchers conducted a exploratory experiment on 2/7/2020 on a sample of track and field runners for young men. The aim of this experiment was to identify the efficiency of devices and tools, as well as knowing the work obstacles and the time needed for testing, and the exploratory experiment has achieved its goals.

**Main Experience:** After making sure of the efficiency of the devices and tools, the players were notified of the test dates. Also, it has been prepared the devices and tools, and the assistant staff were also informed. Later the study experiment has been carried out on 17/2/2020.

**Statistical means:** The test results have been statistically treated by using the statistical program (spss) version 20 and by using computer, Lenovo, with speed processor 2,8 Gb. according to following rules:

| Percentage | analyzing parallel variance (ON WAY ANOVA) |
| L.S.D rule | Arithmetic mean |
| Standard deviation |
| Showing experiment, analyze and discuss |
| Showing, analyzing, and discussing the test results of cardiac functional state and circulatory system for the short, middle, long distance runners. |

**Table (2). Showing the Arithmetic Mean and Standard deviation the test results of cardiac functional state and circulatory system for the short, middle, long distance runners.**

<table>
<thead>
<tr>
<th>Statistics of the sample</th>
<th>s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short distance players</td>
<td>91,13 3,6</td>
</tr>
<tr>
<td>Medium distance players</td>
<td>2,8 75,89</td>
</tr>
<tr>
<td>Long distance players</td>
<td>3,86 94,78</td>
</tr>
</tbody>
</table>

- From table 2 we find that arithmetic mean for testing the cardiac functional state and circulatory system for short-distance players which reached to (91,13) with standard deviation reached to (3,6). While the arithmetic mean for short-distance runners (75,89) with standard deviation (2,8). While the arithmetic mean for the long-distance runners reached to (94,78) with (3,87). Therefore, we find out the variation in the level of Cardiac functional and the circulatory system between the short middle and
long-distance runners. And in order to identify these differences, the researcher carried out an analysis (on way a nova) and it shows in the following table:

**Table (3): Data analysis shows the level of the cardiac functional state and the circulatory system at Short, middle and long distances**

<table>
<thead>
<tr>
<th>Variation resources</th>
<th>Cubes total</th>
<th>Free-work degree</th>
<th>Free-work degree</th>
<th>Cube average</th>
<th>Table value (f)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Of groups</td>
<td>817,065</td>
<td>2</td>
<td>408,532</td>
<td>5,527</td>
<td>4,1</td>
</tr>
<tr>
<td>Inside groups</td>
<td>739,209</td>
<td>10</td>
<td>73,921</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1556,418</td>
<td>12</td>
<td>482,453</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

By knowing table 3 we find out the calculated value of F which reached to (5,527) and this value its bigger than value tablet adults (4,10) under degree freedom (10,20). Thus, there will be nominal differences amid the short, middle and long-distance runners in testing the cardiac state and circulatory system. For this, in order to learn if there any effect which may record for the sake of the runners in these three activities, the researcher has carried out an operation to find out the less nominal value (L. S. D). and for knowing on the best group in this test, as the less nominal value using the best group in it, just to learn the best performance, there has to be a difference in the results of difference analyzation. In this way, (L. S. D) is calculated when there will be differences in the value of (F) more of calculated (F)

**Table 4: It represents the less nominal difference value and the differences for the average to the short, middle and long-distance runners:**

<table>
<thead>
<tr>
<th>Statistics/samples</th>
<th>Short</th>
<th>Middle</th>
<th>Long</th>
<th>Calculated value at L.S.D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-distance runners</td>
<td>15,24</td>
<td>3,65</td>
<td></td>
<td>13,03</td>
</tr>
<tr>
<td>Middle-distance runners</td>
<td>18,89</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-distance runners</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

By seeing table 4 we can find out the difference amid the calculated media amid the long and short and middle-distance runner which reached to (15,240). This difference amid the medians is the larger of value and calculated (L.D.S) this concluded of presenting a nominal difference in selecting the cardiac functional level and circulatory system for the sake of the middle -distance runners due the calculated media for the middle -distance runners is the lessor value than the cleated media for the

While the difference of the calculated media between the short and long-distance runners may reach to (18,89) and the difference between the calculated media value are larger than the calculated value of (L.S.D). That leads to find out a difference in choosing the Cardiac Functional State and Circulatory System for the sake of the short-distance runner.

The researcher may explain the reason that makes the used test distinguished in what accelerated performance and to the continuous effort in performance which leads the middle-distance runners to better than he long and short -distance in this test.

The researcher may explain the reason that makes the middle-distance runner of having a large lynx ability and for distinguishing of having larger cardiac muscle size which reached to average of ability (1200 cm³) also to the pulmometry size which reached to average (4700-5300) (1).

The middle-distance running distinguishes in the present time with huge acceleration. Thus, the middle-distance runners need to acquiring a natural special talent due the highly required performance in the last years. Therefore, we may find out of highly training programs which serve of developing the psychological, physical
and bodily qualities. And some of the middle-distance runner may be described of gathering performance between the long distance and short-distance runners.

**Conclusions and Recommendations**

1. Cardiac functional Efficiency Level and circulatory System for the middle-distance runners are in better Functional Efficiency Level for the Short and Long distance runners.

2. There will be no difference in functional efficiency level in testing the cardiac functional state and circulatory system amid long and short-distance runners.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Al-Ayen University and all experiments were carried out in accordance with approved guidelines.

**References**


Interleukin-6 (174G/C) Gene Polymorphism and Serum Levels of IL-6, their Association with Risk of Obesity in Iraqi Childhood Populations

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Abstract

Background: Childhood obesity is one of the most serious public health challenges of the 21st century.

Aim: The present study was conducted to investigate the association of CD14 genotype and serum levels of IL-6 with risk of ischemic stroke.

Method: A total of 60 patients with obesity were included in the study who were admitted to hospital from the period between March to August 2020, and other groups consist of 60 apparently healthy individuals. A five ml of blood samples were collected, 3 ml of each sample for polymerase chain reaction amplification and detection of IL-6 technique. The remaining (2 ml) for IL-6 serum levels by ELISA assay procedure.

Results: IL-6 (-174G/C) genotype was significantly associated with increased risk of obesity (P = 0.004). However, IL-6 serum levels were higher in subjects with GG genotype compared with those with CG or CC genotype (P < 0.001).

Conclusion: A significant correlation between IL-6 genotype and IL-6 levels were higher level in subjects with GG genotype compared with those with CG or CC genotype.

Keyword: Childhood Obesity, BMI, IL-6.

Introduction

Childhood obesity is one of the most serious public health challenges of the 21st century. It is widely known that obesity reduces child health-related quality of life and is associated with several health and social consequences. These include the risk of premature death, as well as developing diabetes, cancer, heart disease. It also causes undesirable psychological consequences, such as anxiety, depression, sleep disorders and low self-esteem, which affects the social and educational relationships of children. A pooled analysis of 2416 population-based measurement studies showed that from 1975 to 2016 there was a rising trend in children’s and adolescent’s body mass index (BMI). In 2016, 124 million children and adolescents, aged 5–19 years, were estimated to suffer from obesity worldwide and 213 million were overweight. The number of obese children and adolescents (aged five to 19 years) worldwide has risen tenfold in the past four decades. If current trends continue, more children and adolescents will be obese than moderately or severely underweight by 2022. Researchers believe that the increased prevalence of obesity is the result of changes in the life-style of societies, such as the inactivity, unhealthy eating patterns, collapse of energy balance, short sleep duration, increased use of fast food and animal proteins, and increased use of technology. Interleukin-6 (IL-6) is an immune-modulator pro-inflammatory cytokine, secreted by many types of cells, mainly T cells, macrophages, endothelial cells, smooth muscle cells, adipocytes, and hepatocytes. IL-6 is critical in the inflammatory signaling pathway and is involved in the development of obesity and insulin resistance.
Furthermore, IL-6 regulates/stimulates production of cell adhesion molecules, acute phase protein, and mediates the release of other cytokines that amplify the inflammatory response which influence the function of adipose tissue\(^9\). The human IL-6 gene is located on chromosome 7p21, and the -174G/C polymorphism consists of a single nucleotide change from G to C at position -174 in the promoter region\(^10\). The association of the IL-6–174G/C polymorphism with obesity risk has been evaluated in several genetic studies. Some studies have suggested that IL-6–174G/C increased the obesity risk\(^11\), while some found no association between IL-6–174G/C and obesity\(^12\).

**Materials and Method**

The current study was carried on 60 patients (25 males, 35 females) age range between 4-18 years from March to August 2020. Other groups consist of 60 apparently healthy individuals (30 male and 30 female) without any history of systemic disease were clinically considered as healthy also included in this study as a control group. We excluded patients have obesity secondary to a genetic or medical condition, such as diabetics, polycystic ovarian syndrome, hypothyroidism, Cushing’s syndrome, growth hormone deficiency, insulinoma, hypothalamic disorders (e.g., Froelich syndrome, Bardet-Biedl syndrome, Prader-Willi syndrome), or medication use (e.g., antipsychotics). A five ml of blood samples were collected by vein puncture using disposable syringes under aseptic technique 3 ml of each sample were transferred into with EDTA tube and immediately frozen at -20 C till further use to avoid repeated thawing and freezing for polymerase chain reaction amplification and detection of IL-6 (RFLP-PCR) technique. The remaining (2ml) were transferred into sterile test tubes (Plain tube) and allow sample to clot for few minutes at room temperature then followed by separation of serum from the clot by centrifugation for 10 minutes at 2500 r.p.m. and stored at -20°C for ELISA assay procedure. This study was in agreement with ethics of Al-Imam Al Sadiq Teaching Hospital and verbal informed consent was obtained from all participants.

**Results**

Sixty Childhood obesity patients included in this study. The socioeconomic and lifestyle variables distribution of the study population are summarized in Table (1). There were no significant differences between daily duration of sleep and risk for obesity (P = 0.138). The present study found a statistically significant between family income and obesity (p= 0.007). The frequency distribution of obesity further increased with the number of hours per day spent watching television (33.4% of childhood patients spent more than four hours per day in watching television), although the relation was not significant (P = 0.175). The frequency distribution of childhood patients and healthy controls according to physical activity indicated the prevalence of obesity was lower among childhood who practiced physical activity (P= 0.003). Distribution of IL-6–174G>C polymorphism was detected by RFLP-PCR technique, at this locus there are three genotypes, CG, GG and CC with band sizes 198/140/158 bp, 140/158 bp and 198 bp respectively, table (2), figure (1). The genotype distribution had no deviation from Hardy-Weinberg equilibrium in all study groups and agree with the reports of Ibrahim et al\(^13\).Both groups were comparable in Median serum concentration IL-6 table (3), figure (2). Median serum concentration of IL-6 in obesity patients was significantly higher than that of healthy control 127.32 (62.43) ng/L versus 89.44 (29.75) ng/L and P-value was (P < 0.001).Median serum concentration of IL-6 were statistically significantly higher in patients bearing the GG genotype (p< 0.001) compared with heterozygotes (CG) and those homozygous for the CC genotype, and this indicate serum level of IL-6 was highly significant associated to IL-6 genotype polymorphism in childhood patients group, table (4).

**Table 1: Frequency Distribution of Patients with Obesity and Healthy Control according to some Socioeconomic and lifestyle variables.**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Patients n = 60</th>
<th>Control n = 60</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep duration (h/day)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 8, n (%)</td>
<td>19(31.7%)</td>
<td>26(43.3%)</td>
<td>0.138</td>
</tr>
<tr>
<td>9-10, n (%)</td>
<td>17(28.3%)</td>
<td>20(33.3%)</td>
<td></td>
</tr>
<tr>
<td>&gt; 10, n (%)</td>
<td>24(40%)</td>
<td>14(23.4%)</td>
<td></td>
</tr>
<tr>
<td>Average family income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low, n (%)</td>
<td>9(15%)</td>
<td>24(40%)</td>
<td>0.007</td>
</tr>
<tr>
<td>Medium, n (%)</td>
<td>21(35%)</td>
<td>18(30%)</td>
<td></td>
</tr>
<tr>
<td>High, n (%)</td>
<td>30(50%)</td>
<td>18(30%)</td>
<td></td>
</tr>
<tr>
<td>Elevation viewing (h/day)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1, n (%)</td>
<td>14(23.3%)</td>
<td>24(40%)</td>
<td>0.175</td>
</tr>
<tr>
<td>1-2, n (%)</td>
<td>8(13.3%)</td>
<td>9(15%)</td>
<td></td>
</tr>
<tr>
<td>2-4, n (%)</td>
<td>18(30%)</td>
<td>15(25%)</td>
<td></td>
</tr>
<tr>
<td>&gt; 4, n (%)</td>
<td>20(33.4%)</td>
<td>12(20%)</td>
<td></td>
</tr>
<tr>
<td>Physical activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>26(43.3%)</td>
<td>42(70%)</td>
<td>0.003</td>
</tr>
<tr>
<td>No</td>
<td>34(56.7%)</td>
<td>18(30%)</td>
<td></td>
</tr>
</tbody>
</table>
Table (2): Distribution of IL-6 −174G/C Genotype and Alleles Frequency

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Controls (n=60)</th>
<th>Patients (n=60)</th>
<th>OR</th>
<th>95% Confidence interval</th>
<th>p</th>
<th>PF</th>
<th>EF</th>
</tr>
</thead>
<tbody>
<tr>
<td>IL-6 −174G/C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GG</td>
<td>15</td>
<td>26</td>
<td>4.189</td>
<td>1.66 -10.57</td>
<td>0.002</td>
<td>......</td>
<td>0.52</td>
</tr>
<tr>
<td>CG</td>
<td>16</td>
<td>22</td>
<td>3.23</td>
<td>1.31 - 8.43</td>
<td>0.01</td>
<td>......</td>
<td>0.45</td>
</tr>
<tr>
<td>CC</td>
<td>29</td>
<td>12</td>
<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Overall P value</td>
<td></td>
<td></td>
<td>0.004</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Alleles Frequency

<table>
<thead>
<tr>
<th>Alleles Frequency</th>
<th>G</th>
<th>46</th>
<th>74</th>
<th>2.59</th>
<th>1.54 -4.35</th>
<th>0.001</th>
<th>0.378</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>74</td>
<td>46</td>
<td></td>
<td>0.386</td>
<td>0.23- 0.65</td>
<td>0.378</td>
<td>....</td>
</tr>
</tbody>
</table>

Figure (1): Agarose gel electrophoresis image that show the RFLP-PCR product analysis of IL-6 gene−174G/C (rs1800795) gene polymorphism by using SfaNI restriction enzyme in 2.5% agarose gel. Where M: marker (2000-50bp). Lane (CC) wild type homozygote, the product undigested by restriction enzyme and still at 198bp bands. Lane (GG) mutant type homozygote that show digested by restriction enzyme into 140bp and 58bp bands. Lane (C/G) heterozygote, the product digested by restriction enzyme into 198bp, 140bp and 58bp bands.

Table (3): The compassion between the study groups regarding IL-6 level

<table>
<thead>
<tr>
<th>IL-6(ng/L)</th>
<th>Patients n = 60</th>
<th>Control n = 60</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>77.3 – 230</td>
<td>42.72 – 145.33</td>
<td>0.001</td>
</tr>
<tr>
<td>Median (IQR)</td>
<td>127.32 (62.43)</td>
<td>89.44 (29.75)</td>
<td>(S)</td>
</tr>
</tbody>
</table>

Table (4): The Median Serum Interleukin-6 in patients with obesity and control subjects according to Interleukin-6 genotype

<table>
<thead>
<tr>
<th>IL-6 POLY</th>
<th>Patients groups n = 60</th>
<th>Control groups n = 60</th>
</tr>
</thead>
<tbody>
<tr>
<td>GG</td>
<td>149.86(60.7)</td>
<td>113(35.66)</td>
</tr>
<tr>
<td>CG</td>
<td>122.87(37.57)</td>
<td>90.33(13.79)</td>
</tr>
<tr>
<td>CC</td>
<td>93.4(10.41)</td>
<td>77.62(45.57)</td>
</tr>
<tr>
<td>P</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>HS †</td>
<td></td>
<td>HS †</td>
</tr>
</tbody>
</table>
Table (1) revealed that 24 (40%) of the patients with obesity with sleep duration more than ten hours and 14 (23.4%) of healthy control with sleep duration more than ten hours, and this result suggested increased obesity with increased sleep duration, but these results indicated no significant difference in the frequency distribution of patients and control subjects according to sleep duration (P = 0.138). The results of present study agree with results of El-Kabbaoui et al., (14) (2018), which indicated 78 (38.6%) of patients has had more than ten hours sleep duration and these result indicate no significant association between the daily duration of sleep and risk for overweight or obesity (P = 0.75). We found a statistically significant relation between family income and risk of obesity, where the obesity increasing with increasing family income 30 (50%) of patients have had high average family income. Several explanations have been proposed. The low prevalence of obesity in groups of low socioeconomic status in developing countries is related to food scarcity, patterns of high energy expenditure and the greater capacity of the elite to obtain adequate food supplies (15). The correlations may be due to the benefits of economic growth, notably better access to food and high energy expenditure by poorer social groups, difficulty in acquiring more expensive, less energy-dense foods and a trend towards less leisure time and fewer opportunities for exercise (14).

A similar finding was reported in a study of Moroccan adults, in which family income, used as a determinant of socioeconomic status, was strongly associated with obesity (16).

Table (1) revealed that 20 (33.4%) of the patients with obesity was had more than four hours Television viewing, although watching television daily for ≥ 4 h was not significantly associated with obesity in our study when compared to healthy controls (p= 0.175). Watching television may reduce energy expenditure by replacing physical activity and also increase snacking, which is further encouraged by advertisements for energy-dense foods (17). Our results agree with results of El-Kabbaoui et al., (14), which indicated non-significant correlation between watching television daily for ≥ 4 h with the risk of childhood for obesity (p= 0.32). The present results found inverse statistically significant relation between the prevalence of obesity and physical

**Discussion**

Figure (2): Distribution of patients with obesity and control subjects according to the level of Serum Interleukin-6
activity (P = 0.003), where the frequency distribution of childhood obesity patients according to physical activity was as following: 26 (43.3%) patients having physical activity and 34 (56.7%) don’t having physical activity. Inadequate physical activity has been hypothesized to be an important contributing factor to the development of childhood obesity. The influence on energy expenditure can explain this relationship. Physiologically, sedentary posture lowers energy expenditure, and this in turn promotes weight gain. A review of the influence of physical activity on adiposity among 5–18-year-olds showed that adiposity was reduced and aerobic capacity increased with more time spent in intense physical activity. The present results in consistence with results of several studies. For instance, a study in Saudi Arabia showed that intense physical activity was inversely associated with adolescent obesity, and a strong negative association was reported between vigorous physical activity and total and central body fat in Spanish adolescents.

Obesity is caused by several genetic, metabolic, social, and environmental factors. Among these internal and external factors, the contribution of genetic factors has been recognized widely, but the genes involved have not been fully elucidated. Genetic variants, especially functional polymorphisms in the promoter region of genes, may alter the function and expression of genes associated with energy intake and energy expenditure. Several indications of the linkage between single nucleotide polymorphisms (SNPs) and obesity phenotypes have been found. Interleukin-6 polymorphisms have been investigated in many populations for associations with various chronic diseases. For example, single-nucleotide polymorphisms (SNPs) rs1800797(-597 G/A), rs1800796 (-572G/C) and rs1800795 (-174 G/C), located in the promoter region of IL6, have been shown to be associated with obesity and metabolic traits in different ethnic groups. Accordingly, IL-6 -174G>C were selected and their genetic associations with obesity risk were evaluated using RFLP PCR analysis to identify if genetic variants in IL-6 might be a potentially genetic marker to predict the susceptibility of obesity. Overall, highly significant differences can be found in the distribution of the genotype and allele frequencies of IL-6 (rs1800795) between the obesity patients and control subjects (P = 0.004). The present results consistence with results of Nelson et al., which indicated IL-6 -174G>C polymorphism was highly associated with the risk of obesity.

The results of present study showed high frequency of (GG) genotype among patients when compared to healthy controls, these result identify (GG) genotype is associated with increased risk of obesity with statistically significant (P = 0.002), and may be considered as the etiological factor for obesity. The results of present study consistence with result of Yang et al., which found the GG genotype was significantly higher in patients with obesity than in those without ($\chi^2 = 10.63$, $p = 0.005$). The present study are relatively conflicting with previous reports which revealed that the IL-6 rs1800795 SNP in the genotype GG play a protective role and present predominated in the control group (95.3%) with a statistically significant difference compared to that of obese children (28.2%). Moreover, the present result revealed frequency of allele C was more in healthy control compared to obesity patients. Also showed that (CC) genotype frequency in patients (20%) lower than in healthy controls (48.3%) and this results disagree with results Oana et al., which found that the G allele at IL-6 as being more common in lean subjects and observed the C allele to be associated with indices of obesity.

Higher serum concentration of IL-6 may be due to its important role in pathophysiology of obesity. The adipose tissue is a major source of circulating IL-6, and the excessive secretion of IL-6 appears to be directly related to obesity. IL-6 also can influence adipocyte function, lipid metabolism and thus play a major role in the development of obesity. Other theory Saied IL-6 exerts strong effects on hormonal balance and may induce some endocrino logical disturbances. It is suggested that IL-6 may affect the increase of free fatty acids level. IL-6 concentration is elevated in patients with lipid disorders and insulin resistance. The increased IL-6 levels in obese individuals may result in a state of insulin resistance and increased risk of cardiovascular complication. Our results agree with results of Ibrahim et al., which found The mean serum level of IL-6 in obese children was significantly higher as compared to those of control children (7.7±0.46 pg/mL and 5.46±0.40 pg/mL respectively (P=0.003).

Table (4), showed significant association between serum IL-6 levels and IL-6 Polymorphism in patients with obesity (p < 0.001), were we found higher median serum IL-6 levels in the GG genotype 149.86 (60.7) ng/L as compared with CG or CC genotype (122.87 (37.57)ng/L and 93.4 (10.41) ng/L respectively). The present study found higher promoter activity of the rs1800795 G-allele compared with the C-allele, where
CC homozygotes genotype had lower serum IL-6 levels when compared with G-allele carriers in both obesity patients and healthy controls. This suggests that rs1800795 G-allele carriers with higher levels of IL-6 have a higher risk for obesity.

Conclusions

Our results confirm clinically relevant relationship of IL-6 gene polymorphism with risk of obesity. Childhood Patients who undergone obesity showed a higher level of IL-6 than healthy control. In this study we found a significant correlation between IL-6 genotype and IL-6 levels were higher level in subjects with GG genotype compared with those with CG or CC genotype.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Medical Microbiology and all experiments were carried out in accordance with approved guidelines.

References

7. Rodrigues K, Pietranii N, Bosco A. IL-6, TNF-α, and IL-10 levels/polyalleles and their association with type diabetes mellitus and obesity in Brazilian individuals. Arch Endocrinol Metab. 2017; 61(5):438-446.


Serum Macrophage Migration Inhibitory Factor Levels in Patients with Ischemic Stroke in Iraqi Populations

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Abstract

Background: Stroke is one of the leading causes of permanent disability worldwide. The most common cause of stroke is the occlusion of blood circulation by a thrombus (or embolism) although it can also be produced by the rupture of a vessel and subsequent bleeding in a certain region of the brain. Strokes can, therefore, be classified as ischemic or hemorrhagic.

Aim: The present study was conducted to investigate whether serum MIF levels are associated with severity in patients with ischemic stroke.

Method: A total of 40 patients with ischemic stroke were included in the study who were admitted to hospital from the period between March to August 2019, and other groups consist of 40 apparently healthy individuals. Two blood sample were taken from each patients one during attack (within 24 hours) and the other sample during follow up (within 1-3 months) for serum concentration of MIF by ELISA technique.

Results: Mean serum concentration of MIF in Ischemic stroke during attack (within 24 hours) was significantly higher than that of Ischemic stroke during follow up (within 1-3 months) and healthy control group; 17.094±2.25ng/ml versus 12.83± 4.16ng/ml and 6.407± 3.33ng/ml respectively.

Keyword: Ischemic Stroke, MIF, NIHSS, ELISA.

Introduction

Stroke is one of the leading causes of permanent disability worldwide. The most common cause of stroke is the occlusion of blood circulation by a thrombus (or embolism) although it can also be produced by the rupture of a vessel and subsequent bleeding in a certain region of the brain. Strokes can, therefore, be classified as ischemic or hemorrhagic(1). Ischemic stroke (IS) accounts for 85% of overall stroke and its pathophysiology are regulated by a combination of lifestyle, environmental, and unclear genetic risk factors(2). Ischemic stroke is a heterogeneous multi-factorial, polygenic, complex disease resulting from the combination of vascular, environmental and genetic factors(3). Ischemic Stroke often causes severe neurological and motor deficits, leading to decreased quality of life; stroke also has significant clinical and socioeconomic impacts(4). Annually, approximately 800,000 people in the United States have a stroke, and 130,000 die. It has accounted for nearly 5.7 million deaths worldwide, and 87% of these deaths occur in low and middle-income countries(5). Numerous studies have focused on the inflammatory reactions after stroke and identifying the roles of important inflammatory signaling molecules, mainly cytokines(5). Cytokines are up-regulated in the brain after stroke and are expressed not only in immunological cells but also in glial cells and neurons(7). However, the mechanisms leading to increased release of inflammatory cytokines in patients with stroke remain unclear. Macrophage migration inhibitory factor (MIF) a central cytokine of the innate immunity, includes 114 amino acid with a molecular weight of 12.5-kDa and is expressed in a diversity of cell types, including T cells, macrophages, monocytes, endothelial cells and also in activated platelets(6). Furthermore, it is recognized as a multifunctional cytokine participating in both immune
and inflammatory responses\(^9\). MIF is up-regulated in the brain after cerebral ischemia and is involved in neuro-inflammation\(^{10}\). One study demonstrated that serum MIF levels at admission were positively correlated with infarct volume and long-term outcome in patients with acute ischemic stroke (AIS)\(^4\), while another study confirmed that elevated plasma levels of MIF at admission were associated with increased risk of post-stroke depression (PSD) in the next 3 months\(^{11}\).

### Materials and Method

The current study was carried on 40 patients (18 males, 22 females) age range between 45-85 years from March to August 2019. Other groups consist of 40 apparently healthy individuals (20 male and 20 female) without any history of systemic disease were clinically considered as healthy also included in this study as a control group. We used NIHSS Scale to determine the severity of the disease in ischemic stroke patients.

We excluded patients with hemorrhagic stroke, stroke associated with surgery, severe trauma or organ ischemia. A six ml of blood samples were collected and withdrawn from each patient within 2 different period including three ml during attack (within 24 hours) and three ml during follow up (within 1-3 months) and three ml from healthy control by vein puncture using disposable syringes under aseptic technique were transferred to sterile Gel tube, and allow to clot at room temperature and centrifuge at 2500 rpm for 10 minutes and the separated serum was saved in Eppendorf tubes and immediately frozen at -20 C till further use to avoid repeated thawing and freezing for MIF ELISA Kit (Elabscience USA) test. This study was in agreement with ethics of Al-Diwaniya Teaching Hospital and verbal informed consent was obtained from all participants.

The National Institutes of Health Stroke Scale, or NIH Stroke Scale (NIHSS) is a tool used by healthcare providers to objectively quantify the impairment caused by a stroke. The NIHSS is composed of 11 items, each of which scores a specific ability between a 0 and 4. For each item, a score of 0 typically indicates normal function in that specific ability, while a higher score is indicative of some level of impairment\(^{12}\). The individual scores from each item are summed in order to calculate a patient’s total NIHSS score. The maximum possible score is 42, with the minimum score being a 0\(^{13}\).

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Patients (IS)</th>
<th>Healthy Control</th>
<th>OR</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive N(%)</td>
<td>Negative N(%)</td>
<td>Positive N(%)</td>
<td>Negative N(%)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>29 (72.5)</td>
<td>11 (27.5)</td>
<td>16 (40)</td>
<td>24 (60)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>22 (55)</td>
<td>18 (45)</td>
<td>13 (32.5)</td>
<td>27 (67.5)</td>
</tr>
<tr>
<td>Smoking</td>
<td>17 (42.5)</td>
<td>23 (57.5)</td>
<td>15 (37.5)</td>
<td>25 (62.5)</td>
</tr>
<tr>
<td>Alcoholism</td>
<td>8 (20)</td>
<td>32 (80)</td>
<td>3 (7.5)</td>
<td>37 (92.5)</td>
</tr>
<tr>
<td>Heart disease</td>
<td>12 (30)</td>
<td>28 (70)</td>
<td>4 (10)</td>
<td>36 (90)</td>
</tr>
</tbody>
</table>

*NS: No significant association (P>0.05), S: significant association (P<0.05).

### Table (2): Correlation between MIF levels and Severity of Ischemic stroke (NIHS Scale).

<table>
<thead>
<tr>
<th>Serum MIF conc.ng/ml</th>
<th>Mild (1-4 Score)</th>
<th>Moderate (5-20 Score)</th>
<th>Severe (21-42 Score)</th>
<th>P</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>(12.43_17.56)</td>
<td>(10.737_19.60)</td>
<td>(15.011_19.26)</td>
<td>0.001 (HS)</td>
<td>0.512</td>
</tr>
<tr>
<td>Mean</td>
<td>14.98</td>
<td>16.891</td>
<td>18.229</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>4.33</td>
<td>3.12</td>
<td>2.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>0.39</td>
<td>0.52</td>
<td>0.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>7</td>
<td>17</td>
<td>16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*HS =highly significant association (P<0.01).
Results

Forty Ischemic stroke (IS) patients included in this study. The risk factors distribution of the study population are summarized in Table (1). There were no significant differences in smoking status as (P>0.05). The prevalence rates of hypertension, diabetes, alcoholism and heart disease were significantly increased in the IS group compared with those in the control group. Mean serum concentration of MIF in Ischemic stroke during attack (within 24 hours) was significantly higher than that of Ischemic stroke during follow up (within 1-3 months) and healthy control group; 17.094±2.25ng/ml versus 12.83±4.16ng/ml and 6.407±3.33ng/ml respectively, P-value was (P < 0.0001), figure (1). Table (2) showed highly significant correlation between serum levels of MIF and severity of ischemic stroke (NIHSS) (P<0.001, r=0.512). Where serum levels of MIF increased with increasing severity of ischemic stroke as defined by the NIHSS score.

Discussion

The current study showed that 29 (72.5%) of the patients with ischemic stroke had hypertension, and these results indicate high significantly increased in patients with ischemic stroke compared with those in the healthy control group (P= 0.003, OR= 3.95) table (1). This leads us to believe that hypertension is highly non-diaagnosed in population due to the lack of an active non-communicable disease screening program, failure to take routine blood pressure measurements, and a general lack of awareness among health practitioners about hypertension and their complications(14). The present results are generally in accordance with previous studies where indicated that hypertension reduction being associated with a reduced rate of ischemic stroke(15). These results consistence with results of Li et al(4), who found that 91 (62.3%) with hypertension and indicate that hypertension significantly increased in the ischemic stroke group compared with those in the control group.
In our results there are 22 (55%) of patients with ischemic stroke had diabetes, and these results indicate significant correlation between diabetes and ischemic stroke when compared with healthy controls groups (p < 0.05, OR=2.53). Diabetes is a recognized independent risk factor for stroke and is associated with higher morbidity and mortality\(^{(16)}\). The physiology underlying the increased risk of ischemic stroke in diabetics may be attributable to the increased prevalence of intracranial stenosis in this population\(^{(17)}\). Vasculopathy induced by chronic diabetes related endothelial damage results in acceleration of atherosclerosis inherent to diabetes\(^{(18)}\). Which in consistence with old studies that showed diabetes can commonly causes small infarcts which less likely to lead to a fatal stroke\(^{(19)}\).

Although our results indicate 17(42.5%) from individuals with ischemic stroke are active smokers, but these results shows there is no significant correlation between the active smokers and ischemic stroke when compared with control groups, although the smokers are high in ischemic stroke groups (p > 0.05, OR=1.23) table (1). Although our study indicate non-significant association between the smokers and ischemic stroke when compared with control groups, but remain the smoking as important risk factors for ischemic stroke. The mechanism by which passive smoking can increase the risk of stroke has been reported in many studies. Passive smoking can lead to carotid atherosclerosis\(^{(20)}\), and the levels of homocysteine, fibrinogen, and oxidized low-density lipoprotein cholesterol can also be elevated by smoking\(^{(21)}\). About 8 (20%) of patients with ischemic stroke were alcohol consumption, as table (1), and there is a significant correlation between the ischemic stroke and alcoholism when compared with healthy control group (P= 0.038, OR= 1.6). Ischemic stroke is caused by a number of different pathophysiological mechanisms and alcohol drinking might have contrasting effects on ischemic stroke. For example, moderate and high alcohol consumption is associated with an elevated risk of atrial fibrillation, which is a risk factor for ischemic stroke\(^{(22)}\). The risk for ischemic stroke was significantly higher for binge drinkers than for subjects with no heavy drinking pattern\(^{(23)}\). The present results consistence with that of Xu et al\(^{(11)}\), who found that 52 (15.6%) with alcohol consumption.

The frequency of heart disease among the ischemic stroke patients are 12(30%) as in table (3-5), and these results indicate significant association between heart disease and ischemic stroke when compared with healthy control groups (p < 0.05, OR= 3.85). Previous study showed that approximately 10% to 24% of patients with stroke have heart failure\(^{(24)}\). Our study indicate frequency lower than Yalcin et al\(^{(25)}\), which showed (57.5%) of the stroke patients had history of ischemic heart disease, and it may be due to short longevity of our patients after developing ischemic heart attack as compared to others in the developed countries, and short longevity after developing coronary heart disease. Furthermore, increasing evidence that heart disease is independently associated with cognitive impairment exists; and cognitive impairment is associated with decreased survival among hospitalized stroke patients\(^{(24)}\).

Figure (1) showed that mean serum concentration of MIF were highly significantly increased among cases with ischemic stroke during attack (within 24 hours) 17.094± 2.25 ng/ml as compared to apparently healthy controls 6.407± 3.33ng/ml, these results revealed a significant association between the concentration of MIF and the ischemic stroke (P <0.001). A study by Inacio et al\(^{(19)}\) (2011), indicated that MIF promotes neuronal death and aggravates neurological deficits after experimental stroke. They found that MIF promoter activity was significantly upregulated by hypoxia during ischemic stroke and that MIF protected neurons against oxygen–glucose deprivation. Thus, the reason why serum MIF levels are increased in ischemic stroke patients remains unknown. Serum MIF levels were found to be decreased with blood-sampling time, with the highest levels of serum MIF at ischemic stroke during attack (within 24 hours) (17.094 ± 2.25 ng/ml), and this levels decrease at cases with ischemic stroke during follow up(within 1-3 months) (12.83± 4.16ng/ml), these difference in serum MIF levels between ischemic stroke during attack (within 24 hours) and ischemic stroke during follow up(within 1-3 months) was statistically significant (P<0.001), figure (1). These results indicate that MIF might play an important role in inflammatory process of central nervous system. However, serum MIF levels were highly significantly elevated in any time of ischemic stroke when compared with the controls (P <0.001). Table (2) showed positive correlation between serum MIF levels and severity of ischemic stroke (NIHSS) (P<0.001, r=0.512). where serum levels of MIF increased with increasing severity of ischemic stroke as defined by the NIHSS score, were highest MIF levels in the severe group (18.229 ± 2.45 ng/ml) as compared to moderate and mild severity (16.891± 3.12 ng/ml and 14.98 ± 4.33 ng/ml respectively). The present results are
consistence with results of Xu et al\(^{(11)}\), which indicated there was a positive correlation between levels of MIF and the NIHSS (r = 0.248, P<0.001).

**Conclusions**

Our study demonstrated that the serum level of MIF significantly increased following ischemic stroke. The serum MIF levels at admission were positively correlated with the infarct volumes and the severity of patients with IS. In this study we found increased inflammatory response after ischemic stroke compared with healthy control, represented by increased levels of MIF.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Medical Microbiology and all experiments were carried out in accordance with approved guidelines.

**References**

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Genotype and Haplotype of Interleukin-17F (IL-17F) in Peptic Ulcer in Iraqi Patients

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Abstract

A peptic ulcer can be described as a condition in which there is a discontinuity in the entire thickness of the gastric mucosa. The discontinuity can also involve the submucosa, and in some cases, the deeper layers of the muscle wall¹. Immunological serological and molecular factors play a great role in the susceptibility and diagnosis of this disease. IL-17F genotyping were reported to have an influencing in all types of peptic ulcer. The current study aims to detect some cytokine concentration (proinflammatory and Regulatory) in patients’ blood, and some cytokine polymorphism. During the time from July 2019 to November 2019, the case-control study enrolled 318 blood samples collected from the patients who attended the Marjan Teaching Hospital- Hilla, as well as 60 healthy people. IL-17F genotyping was performing for 55 patients with peptic ulcer, and 30 healthy people as control, by using the PCR-SSP method. All types of peptic ulcers were significantly associated with IL-17F. Associations were also observed with IL-12A and IL-CXCR2. In conclusion, IL-17F, haplotypes, and genotypes have related to peptic ulcers so it can be dependent as a genetic marker for the susceptibility of this disease in Iraq.

Keywords: Gastric ulcer, Doudenal ulcer, Oesophagus ulcer, genotype, haplotype, IL17 F.

Introduction

A peptic ulcer is a lesion that may develop in gastric mucosa and submucosa or duodenum. Peptic ulcers develop because of increased acid secretion due to alcohol use, nonsteroidal anti-inflammatory drugs such as sedatives and aspirin, continuous and prolonged hunger, continuous stress, infection with Helicobacter pylori, and poor diet. Anticholinergic drugs, antihistamine, prostaglandin-like drugs and antimicrobials, proton pump inhibitors, and antimicrobial and anti-H. pylori antibiotics are the most important treatment lines for a peptic ulcer (2). Most ulcers are caused by an infection with a type of bacteria called Helicobacter pylori (H. pylori). Patients with (PUD) caused by H. pylori infection were mostly in the middle age of <50 years (3). Infection with this microorganism plays a major role in the pathogenesis of gastric adenocarcinoma (GA) (4).

An ulcer in the stomach is known as a gastric ulcer while that in the first part of the intestines is known as a duodenal ulcer. The incidence varies with age, gender, geographical location, and is associated with severe complications including hemorrhages, perforations, gastrointestinal obstruction, and malignancy. Thus, this clinical condition represents a worldwide health problem because of its high morbidity, mortality, and economic loss (5, 6, 7). Gastric ulcer is one of the most common and serious chronic diseases of the upper gastrointestinal tract. The prevalence of gastric ulcers is 2.4% in the western population and maybe up to 6.1% in Asia (8).

Gastric ulcer (GU) disease results from an interplay of environmental, microbial (Helicobacter pylori), pharmacological (non-steroidal anti-inflammatory drugs), excessive gastrin production (Zollinger-Ellison syndrome) and genetic factors (9). However, other causes like stress, smoking, spicy food, and nutritional deficiencies, can result in GU (10). Diabetes is an independent risk factor for gastric ulcer bleeding (11). Duodenal Ulcer Occurs most often in the first portion of the duodenum) 12 (with ~90% located within 3 cm of the pylorus. Ulcers can be demarcated, with depth at times reaching the muscularispropria. The base of the
ulcer often consists of a zone of eosinophilic necrosis with surrounding fibrosis. Malignant duodenal ulcers (MDUs) are extremely rare and are more common than GUs in western countries. An esophageal ulcer is a distinct break in the margin of the esophageal mucosa. This mucosal damage to the esophagus is often caused by gastroesophageal reflux disease or from severe sustained esophagitis from other causes.

**Material and Method**

**Patients and Controls:** Three hundred Eighteen blood samples were collected from clinically diagnosed peptic ulcer patients who regularly admitted by medical committee specialized medicals center of the digestive system of Marjan hospital (Babylon) from July 2019 to November 2019, the age of patients between (≤10- 80) years including both sex male (156) and female (162), in addition to (60) samples were taken from apparently healthy human was taken from Babylon province as control. The study was approved by the Research Ethics Review Boards of the University of Babylon. Patients with peptic ulcers, including the newly and long-time diagnosed patients, were diagnosed according to the specialized physician, some of them were suffering from chronic diseases and others have a history with medication, in addition to other causes such as smoking, *H.pylori*, stress, etc.

**Blood Sampling:** The venous blood was collected from the patients and healthy persons by using (5ml) syringes, and then separated to (2ml) with anticoagulant tube and (3ml) without anticoagulant. The blood samples without anticoagulant allowed clotting at room temperature and then serum was separated by centrifugation at (3000 rpm) for (5min), and that was within 2-3 hours after collection (16). Blood samples with anticoagulants were used for the DNA extraction by using a specific DNA extraction kit, which performed according to the protocols recommended by the manufacturer (Favorgen/Taiwan).

**IL 17 F genotype analysis:** IL 17 F genotype was performed with PCR-sequence-specific primers (PCR-SSP). The total volume of PCR Eppendorf tube for 17 F was prepared of 25µl, by adding 2.5 µl DNA and 1µl from each reverse and forward 1, 2 of the primer to PCR Eppendorf tube containing 12.5 µl master mix then 8µl nuclease-free water was added for reach the final volume (25µl). The DNA amplification for IL17 F includes an initial denaturation of 5 min in 94°C, 32 cycles of amplification (every cycle consists of denaturation of 30 s in 95°C, hybridization of primers during 30 s in 58°C, and an extension of 30 s in 72°C), and a final extension of 10 min in72°C, then the PCR products were separated in 1.5 % agarose electrophoresis system using ethidium bromide then visualized with the gel documentation, with 100 bp-ladder (Bioneer, Korea) and photographed. The sequences of primers used for the amplification of the genes are presented in table 1.

**Table 1: Sequences of the couples of primers used for the amplification of the genes.**

<table>
<thead>
<tr>
<th>Reference</th>
<th>Size (bp)</th>
<th>Sequence 5-3</th>
<th>Gene name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rolandelli et al., 2019</td>
<td>106bp</td>
<td>5′-GGATATGCACCTTTACTGACTT-3′&lt;br&gt;5′-GGATATGCACCTTTACTGACTC-3′&lt;br&gt;5′-CACCAAGGCTCTGCTCTTTC -3′</td>
<td>Primer 17 F rs (763780)</td>
</tr>
</tbody>
</table>

**Statistical Analysis:** All data were statistically analyzed according to software program SPSS version 20 statistical software (SPSS version 20, Inc., Chicago, IL, USA). The identified Primer 17F and association between type of peptic ulcer, alleles, haplotypes, and genotypes were assessed using the odds ratio with its 95% confidence interval (OR, CI 95 percentage).

**Results**

The present study reveals a noticeable variety of IL17F haplotype among the type of peptic ulcers. IL17F discriminated by PCR assay.
The distribution of interleukin-17F according to the site of the ulcer: The distribution of interleukin-17F (IL-17F T>C) genotyping according to site ulcer show that high appearance in all types, for Gastric Ulcer, TT genotypes high appearance 9(32.14%) with high OR(4.926) (p. value 0.004) (CI 1.619-14.992) while CC show only 3(10.71%) with OR(1.282) (p. value 0.54) (CI 0.260-6.315), for Doudenal Ulcer, TT genotypes show 2(13.33%) with high OR(5.167) (p. value 0.001) (CI 2.824-8.464) while CC show 2(13.33%) with OR(1) (p. value 0.665) (CI 0.161-6.192), for Oesophagus Ulcer, TT genotypes show 2(16.66%) with high OR(11.66) (p. value 0.002) (CI 2.116-64.326) while CC show 1(8.33%) with OR(1.692) (p. value 0.554) (CI 0.169-16.912), so TT genotypes had a Risk factor in the type of Peptic Ulcer while CC genotypes had a protective effect in a type of Peptic Ulcer, Table (3).

The distribution of interleukin-17F according to the cause of the ulcer: The distribution of interleukin-17F (IL-17F T>C) genotyping according to cause ulcer show that high appearance in all types, Bacterial Ulcer TT genotypes high appearance 10(33.33%) with high OR(4.667) (p. value 0.004) (CI 1.571-13.866) while CC show only 2(6.66%) with OR(2.154) (CI 0.363-12.764), Active bleeding Ulcer TT genotypes show 2(13.33%) with high OR(5.167) (p. value 0.001) (CI 2.824-8.464) while CC show 3(20%) with OR(0.615) (p. value 0.429) (CI 0.119-3.191), Stress Ulcer TT genotypes show 1(10%) with high OR(12) (p. value 0.001) (CI 2.307-19.168) while CC show 1(10%) with OR(1.385) (p. value 0.633) (CI 13.6-14.071), so TT genotypes had a Risk factor in the type of Peptic Ulcer while CC genotypes had a protective effect in a type of Peptic Ulcer, table (4).
Table (4): Distribution of patient samples of interleukin-17F (IL-17F) according to the cause of the ulcer with genotype.

<table>
<thead>
<tr>
<th>Object</th>
<th>Sample No.</th>
<th>Genotype</th>
<th>Sample No.</th>
<th>OR</th>
<th>CI</th>
<th>Chi-Square (P.Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacterial Ulcer</td>
<td>30</td>
<td>C/C</td>
<td>2(6.66%)</td>
<td>2.154</td>
<td>(0.363-12.764)</td>
<td>0.335</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T/C</td>
<td>18(60%)</td>
<td>0.133</td>
<td>(0.040-0.446)</td>
<td>0.001**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T/T</td>
<td>10(33.33%)</td>
<td>4.667</td>
<td>(1.571-13.866)</td>
<td>0.004**</td>
</tr>
<tr>
<td>Active bleeding Ulcer</td>
<td>15</td>
<td>C/C</td>
<td>3(20%)</td>
<td>0.615</td>
<td>(0.119-3.191)</td>
<td>0.429</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T/C</td>
<td>10(66.66%)</td>
<td>0.100</td>
<td>(0.024-0.422)</td>
<td>0.001**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T/T</td>
<td>2(13.33%)</td>
<td>5.167</td>
<td>(2.824-8.464)</td>
<td>0.0001**</td>
</tr>
<tr>
<td>Stress Ulcer</td>
<td>10</td>
<td>C/C</td>
<td>1(10%)</td>
<td>1.385</td>
<td>(13.6-14.071)</td>
<td>0.633</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T/C</td>
<td>8(80%)</td>
<td>0.050</td>
<td>(0.008-0.309)</td>
<td>0.001**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T/T</td>
<td>1(10%)</td>
<td>12.000</td>
<td>(2.307-19.168)</td>
<td>0.001**</td>
</tr>
</tbody>
</table>

The distribution of interleukin-17F according to the gender of the ulcer: The distribution of the interleukin-17F (IL-17F T>C) genotyping according to the gender through the below table, notice that the genotype of the genes shows that the (C/T) gene in patient samples with percentage 65.45% was dominant, where the ratio was 36% divided by 21 females and 15 males, while the control was the same by 8 for each gender, while the (T/T) gene with percentage 23.63% ranked second in terms of genotype where 11% of the patients were divided into 8 females and 5 males, but the control was for females higher than males, while the third gene (C/C) constituted 10.9% of the total samples was the lowest in terms of genotype at 6% distributed for females by 4% males 2%. However, it is noteworthy that the percentage of control was higher than the previous percentage of genes, as it was shown that this gene was higher in females than males, table (5).

Table (5): Distribution patient samples of interleukin-17F (IL-17F) genotype and control according to gender.

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Gender</th>
<th>Patients</th>
<th>Control</th>
<th>OR</th>
<th>CI</th>
<th>Chi-Square (P.Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C/C</td>
<td>Female</td>
<td>4(66.66%)</td>
<td>4(44.44%)</td>
<td>2.500</td>
<td>(0.292-21.399)</td>
<td>0.378</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>2(33.33%)</td>
<td>5(55.55%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C/T</td>
<td>Female</td>
<td>21(58.33%)</td>
<td>8(50%)</td>
<td>1.400</td>
<td>(0.429-4.570)</td>
<td>0.577</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>15(41.66%)</td>
<td>8(50%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T/T</td>
<td>Female</td>
<td>8(61.53%)</td>
<td>3(60%)</td>
<td>1.067</td>
<td>(0.129-8.793)</td>
<td>0.676</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>5(38.46%)</td>
<td>2(40%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The distribution of interleukin-17F according to the age group of the ulcer: The distribution of interleukin-17F (IL-17F T>C) genotyping according to age group, showed a significant moral difference in the following age groups (11–20) show genotype (T/T) high appearance with high OR(7) (p.value 0.029), (41–50) show genotype (T/T) high appearance with high OR(11.66)(p.value 0.024), (51–60) show genotype (T/T) high appearance with high OR(7) (p.value 0.029), so SNPs in samples show revealed high prevalence of (C/T) genotype in patient samples with
percentage 65.45% and (T/T) genotype in the second place with percentage 23.63%, while (C/C) constituted 10.9% of the total samples. As for his part OR we notice the overpowering T/T where was his highest value in age (11-20) (21), Table (6).

Table (6): Distribution of patient samples of interleukin-17F (IL-17F) genotype according to age group.

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Sample No.</th>
<th>Genotype</th>
<th>Sample No.</th>
<th>OR</th>
<th>CI</th>
<th>Chi-Square (P.Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥10</td>
<td>3</td>
<td>C/C</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C/T</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>0.010*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T/T</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>11 - 20</td>
<td>10</td>
<td>C/C</td>
<td>1</td>
<td>0.135</td>
<td>(0.136-14.071)</td>
<td>0.633</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C/T</td>
<td>8</td>
<td>0.050</td>
<td>(0.008-0.309)</td>
<td>0.001**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T/T</td>
<td>1</td>
<td>21.000</td>
<td>(2.307-191.168)</td>
<td>0.001**</td>
</tr>
<tr>
<td>21 - 30</td>
<td>14</td>
<td>C/C</td>
<td>1</td>
<td>2.000</td>
<td>(0.202-19.754)</td>
<td>0.485</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C/T</td>
<td>6</td>
<td>0.267</td>
<td>(0.064-1.113)</td>
<td>0.070</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T/T</td>
<td>7</td>
<td>2.333</td>
<td>(0.632-8.619)</td>
<td>0.171</td>
</tr>
<tr>
<td>31 - 40</td>
<td>8</td>
<td>C/C</td>
<td>1</td>
<td>1.077</td>
<td>(0.103-11.234)</td>
<td>0.721</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C/T</td>
<td>5</td>
<td>0.120</td>
<td>(0.021-0.673)</td>
<td>0.009**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T/T</td>
<td>2</td>
<td>7.000</td>
<td>(1.180-41.536)</td>
<td>0.029*</td>
</tr>
<tr>
<td>41 - 50</td>
<td>6</td>
<td>C/C</td>
<td>1</td>
<td>0.769</td>
<td>(0.070-8.405)</td>
<td>0.622</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C/T</td>
<td>4</td>
<td>0.100</td>
<td>(0.014-0.703)</td>
<td>0.024*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T/T</td>
<td>1</td>
<td>11.667</td>
<td>(1.188-114.590)</td>
<td>0.024*</td>
</tr>
<tr>
<td>51 - 60</td>
<td>8</td>
<td>C/C</td>
<td>1</td>
<td>1.077</td>
<td>(0.103-11.234)</td>
<td>0.721</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C/T</td>
<td>5</td>
<td>0.120</td>
<td>(0.021-0.673)</td>
<td>0.019*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T/T</td>
<td>2</td>
<td>7.000</td>
<td>(1.180-41.536)</td>
<td>0.029*</td>
</tr>
<tr>
<td>61 - 70</td>
<td>5</td>
<td>C/C</td>
<td>1</td>
<td>0.615</td>
<td>(0.054-6.947)</td>
<td>0.561</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C/T</td>
<td>4</td>
<td>0.050</td>
<td>(0.0050.547)</td>
<td>0.010*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T/T</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>71 - 80</td>
<td>1</td>
<td>C/C</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C/T</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>0.194</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T/T</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>55</td>
<td></td>
<td>55</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discussion

The results showed a significant association of IL-17F (IL-17F C>T) rs (763780) polymorphisms with susceptibility to the peptic ulcer (especially Gastric Ulcer GU), TT genotypes high appearance (23.63%) while CC show (10.9%), so TT genotypes had a Risk factor in the type of Peptic Ulcer while CC genotypes had a protective effect in a type of Peptic Ulcer.

These results agree with each of: (18) by showing that TT appearance was at a high rate, (19) by showing that TT genotypes were at a high appearance (38.8%) while CC showed (27.3%), (20) by showing that TT genotypes were at a high appearance (89.3%) while CC showed (0.7%), (21) by showing that TT genotypes were at a high appearance (97.0%) while CC showed (3%), (22,23,24,25,26), show that TT appearance was at a high rate.

While the study of (27) showed CC genotypes high appearance (81.59%) and TT show (6.75%), (28) that showed CC genotypes high appearance (94.91%) while TT show (5.09%), excluded due to the relatively small sample size of our study. Previous studies have identified the IL-17 F polymorphism as a potential genetic marker for gastric cancer risk (29).

In Bacterial Ulcer (H. pylori), TT genotypes show a high appearance (33.33%) with high OR (4.667), while CC show only (6.66%) with OR (2.154). Active bleeding Ulcer TT genotypes show (13.33%) with high OR (15.167) while CC show (20%) with OR (0.615) (P. value 0.429) (CI 0.119-3.191), Stress Ulcer TT genotypes show (10%) with high OR (21) while CC show (10%) with OR (1.385).

Study of (27), for Bacterial Ulcer (H. pylori), TT genotypes were (57.67%). For active bleeding Ulcer, TT genotypes show (44.48%), while for stress Ulcer TT genotypes show (34.36%). It was shown that this gene was higher in females (60%) than males (40%). (30, 22, 19, 20, 26) shown that higher in females than males. While (18) show that was higher in males (41%) than females (17%), (27, 24) show that was higher in males than females due to a variety of environmental and host genetic factors.

The results showed a significant association of IL-17F (IL-17F C>T) rs (763780) polymorphisms with age groups (11-20) show genotype (T/T) high appearance with high OR (12) (P.value 0.001) and (31-40) show genotype (T/T) high appearance with high OR (7) (P.value 0.029). (18, 31) is associated with an increased risk for the severity of gastric mucosal atrophy in subjects younger than 60 years, (19) shown that was higher in ≥ 50 yr (82.9%) than < 50 yr (17.1%). While (27) show that was higher in <60 (56.13%) than ≥60 (43.87%) due to a variety of behavioral factor like smoking and a high salt diet.

Conclusion

This study was designed to assess the associations of IL 17F, haplotypes, and genotypes with the risk of developing a type of peptic ulcer in Iraq. Certain IL 17F,
haplotypes, and genotypes were related to peptic ulcers and may be used as genetic susceptibility markers to peptic ulcers. Further studies of IL17F and peptic ulcer in Iraq are needed to confirm the present results and to provide data for the development of screening assays and for better management of patients with peptic ulcers at the onset of disease.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Science for women and all experiments were carried out in accordance with approved guidelines.

References
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Types of Evidence Before the International Criminal Court

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Abstract

Evidence for proof that the international courts relied on varies, including the International Criminal Court. There is direct evidence to prove, and there is indirect evidence for proof, and direct evidence is intended to be evidence that is directly focused on the incident to be proven, and if the judge acquires his knowledge of the incident to be proven directly, it may be This evidence is anecdotal, and it may be material, and anecdotal evidence is known as the kind of deductive or inductive evidence that the mind perceives or that the thought concludes from its analysis of the facts, circumstances, or motives that cover the commission of the crime or the occurrence of the accident, it is what emanates from personal elements represented in what comes from others From sayings, which are represented in testimony and recognition, as for material evidence, it means everything that has an entity that can be perceived and disclosed, whether by human senses, that is, directly, or by means of modern scientific technology, that is, indirectly, and is represented in written evidence and electronic evidence, while indirect evidence is Evidence that is not focused directly on the incident to be proven, that is, it is focused on another incident with a close logical connection to it, so it requires the application of reason and For logic to deduce the event on which the evidence is directed and which it is intended to prove, when the event that embodies the content of the evidence requires some intellectual processes of examination, analysis, extrapolation and deduction. Here the evidence is indirect. Experience and clues.

Keywords: Evidence, Types, Criminal Court.

Introduction

Evidence generally represents the elements of criminal proof in the criminal case, and is embodied by the facts or things that the evidentiary procedures reveal and transfer them to the field of the case¹. The principle of judicial conviction which is adopted by all international courts, including the International Criminal Court. The judge has the right to take any evidence that he is comfortable with, meaning that the judge is not bound by a specific evidence, especially since there are multiple divisions of evidence, but the most important of these divisions is the division that is based on the relationship of evidence.² With the incident to be proven, which is the division of the evidence evidence into direct evidences and indirect evidence, so the evidence of proof shall be direct if the judge obtained his knowledge from him directly of the incident in question, the example of which is anecdotal evidence and physical evidence such as testimony, confession, written evidence and electronic evidence, but if the incident that represents The content of the evidence requires some intellectual and intellectual practical examination, scrutiny, analysis, extrapolation and deduction. Here the evidence is indirect. Experience and clues.

Research Importance: The importance of research shows that the issue of the types of evidence before the International Criminal Court has not been adequately studied and researched, and its importance in reaching the truth by helping the judge build his judgment, which he will issue on sound and correct foundations.

Research Problem: The problem of research is to know the legal basis of the evidence before the International Criminal Court, and the authenticity of this
evidence. Therefore, our study raises the extent of the legal value of evidence before the International Criminal Court.

**Research Methodology**

This research relied on the analytical and descriptive method, through which we analyze the legal texts that came in the Rome Statute, and from which it is inferred that the International Criminal Court relies on these evidence in issuing its rulings.

**The First Section:**

Types of evidence before the International Criminal Court

Evidence for evidence relied on by international courts, including the International Criminal Court, in issuing their judgments, some of which are direct evidence, and some are indirect evidence, and to clarify the types of these evidence we will divide this topic into the following two requirements: -

The first requirement: direct evidence before the International Criminal Court.

The second requirement: indirect proof of evidence before the International Criminal Court.

**The first requirement**

**Direct evidence before the International Criminal Court:** Evidence shall be direct if it is directed directly to the incident to be proven, and if the judge acquires his knowledge of it directly of the incident to be proven. This evidence may be anecdotal, or it may be material, and this is what we will discuss in the following two sections as follows: -

The first branch: anecdotal evidence.

The second branch: physical evidence.

**First branch**

**Anecdotal Evidence:** Anecdotal evidence means the kind of deductive or inductive evidence that the mind perceives or that the thought concludes from its analysis of the facts, circumstances, or motives that pertain to the commission of the crime or the occurrence of the accident, it is that which emanates from personal elements represented by the sayings of others, that is, they are non-moral matters Materialism needs clarification, and it bears a lot of interpretation and interpretation, and it does not necessarily relate to fixed material facts. It indicates it and the statements of another person who may be a witness or an accused if the evidence is a confession. The anecdotal evidence is represented in testimony and confession, and this is what we will discuss in turn: -

**First: Testifying:** Testifying means giving a person the information he has about the crime and which he perceives with one of his senses, whether that information is related to proving the crime, the circumstances of its occurrence, or the circumstances surrounding it. She is reassured about her and rejects her when she becomes suspicious and suspicious of her, for the matter in the end is due to the court's conviction and reassurance. With regard to a specific incident, and do not take it into account in another incident or with regard to a specific accused, nor take it into account in relation to another accused.

**Second: Recognition:** The confession is known as the defendant's admission that he has committed the accusation against him, and he is the master and the most influential of the same judge, and he claimed it towards his direction of conviction. If the conditions of its validity have been fulfilled, the court must verify its truthfulness and conformity with reality, and it is an objective matter that enters the authority of the court, so it may take it if it is satisfied with it. Taking into account its manifestations. This is what the legislation of the Latin system adopted, but the legislation of the Anglo-Saxon system deviated from this rule. In English legislation, if the accused made a confession that meets the conditions, it is considered legal evidence of the conviction that exempts the judge from searching for any other evidence, and the consideration begins In assessing the punishment, this exception does not change the principle of judicial conviction, and there are criminal legislation in some countries, such as France and the United States of America. Confession alone is not sufficient for a conviction, and other evidence must be present. She supports him, while in other countries, such as Britain, relies on confession alone to convict him, without the need for other evidence to support him.

**The second branch**

**Physical Evidence:** Physical evidence is defined as everything that has an entity that can be perceived and disclosed, whether by human senses, that is, directly,
or by means of modern scientific technology, that is, indirectly, and thus it is not required to disclose physical evidence through vision or directly through touch, as the evidence is material. Even if it is disclosed by scientific means and method. The physical evidence is represented in the written evidence and electronic evidence, and this is what we will discuss in succession:

First: Written evidence: Written evidence is defined as a paper that carries data regarding an incident of importance in proving the commission of the crime and attributing it to the accused. The written evidence may be documentary, and writing may be by hand, typewriter, printing, copies, pictures, or recording sounds or symbols, and this evidence In order for it to be suitable to prove the incident, it must be true in itself, meaning that the document is real and not forged. Its statutes give certain documents authentic before it. All documents and papers in the eyes of these courts are the same, as they are all subject to the conviction of the same court.

Second: Electronic Evidence: Electronic evidence, in general, is either paper output produced by printers or plotters, or it is paperless output or it is electronic, such as tapes, magnetic disks, video discs and other non-traditional electronic forms, or it is represented in the presentation of the outputs of computer-mediated processing. On its own screen, or the Internet through screens or a visual display unit. These evidence are digital evidence and open source evidence, as for the authenticity of digital evidence in criminal proof, this authenticity differs according to the evidentiary systems adopted by the legislation in terms of the restricted proof system And the free proof system in particular, under the restricted evidence system, the legislation that follows the Anglo-Saxon approach goes to the application of the best evidence rule, which necessarily requires submitting the origins of the document and not contenting itself with a copy of it. Thus, the writing on the computer disk in its electromagnetic form can be considered the original copy, and this does not clash with the base of the best evidence. At that time, the electronic documents are provided as an original copy, and as a result, the value of the computer output appears as an acceptable evidence for proof in criminal matters. As for the free evidence system, in which the judge has broad authority in evaluating the evidence in terms of its probative, so the judge may accept or reject the evidence according to his conviction. With regard to the authenticity of open source evidence, although there is no comprehensive international standard for the admission of video and photo evidence in international courts, the information is often accepted as evidence if it is proven that it is relevant remotely.

The second requirement:

Indirect proof of evidence before the International Criminal Court: Indirect evidence is defined as evidence that is not focused directly on the incident to be proven, meaning that it is focused on another incident with a close logical connection to it, so the introduction of this type of evidence requires the use of reason and logic to deduce the fact on which the evidence is directed and which it wants to prove, and then It is considered the lowest level of direct evidence, including evidence obtained by scientific method and means from the reality of the effects that are left behind at the crime scene, that is, those that emanate from technical expertise based on scientific and practical method. The following two are as follows:

The first branch: experience.

The second branch: the clues.

First branch

Experience: Experience is defined as a physical or mental estimate expressed by art or specialist owners in a technical matter that the person investigating the crime cannot know with his own information, whether that technical issue is related to the person of the accused, the object of the crime, the materials used in its commission or its effects. Criminal evidence, if a matter appeared during the proceedings and its course of the case that requires a scientific or technical opinion to clarify its truth, and the judge was not able to express his opinion on it, because it requires knowledge and knowledge of a scientific or technical field in the scope of certain sciences such as medicine, engineering, chemistry, social and psychological sciences, or a specific profession such as drafting and construction And mechanics and electricity, as is the case with knowledge of fingerprints and footprints, the real cause of death, the effects of firearms, the nature of stains and their analysis, as the experience is represented in specialized technical reports issued by the expert regarding his scientific opinion in certain facts, it is a scientific and technical assessment of a specific incident. Based on scientific criteria, and the judge touches this incident through technical appreciation of it, and through the judge’s assessment
of the expert’s opinion, he reaches the formation of his conviction.

The Nuremberg Tribunal has used medical expertise to clarify the health status of some of the defendants, despite the lack of legal texts regulating it.

As for the courts of the former Yugoslavia and Rwanda, the procedural and evidence rules for each of them included some judgments related to experience. The experience was taken before these two courts in many matters, including forensic medicine, ballistics, the accused’s medical health, historical conflicts, military matters and others.

International criminal courts consider experience a kind of testimony of opinion, influenced by the Anglo-Saxon system, which considers the expert as a witness, so he is subject, like other witnesses, to taking an oath, as they call the experts (expert witnesses).

As for the International Criminal Court, there are no texts related to experience, neither in the statute nor in the procedural and evidence rules, but according to the principle of judicial conviction that all international criminal courts adopt, it is possible to resort to experience whenever they find the court’s judges necessary, i.e. Whether or not to take experience within the authority of the discretionary court, as the statute of the International Criminal Court indicated that the court may order the submission of evidence in addition to evidence already collected before the trial or presented by the parties during the trial. Request the submission of all evidence deemed necessary for truth determination.

The expert is required to be neutral and impartial. The principle is that the expert is a neutral person who does not have a special interest in the lawsuit, but he may be biased towards the party of the case who requested and paid his fees, and this leads to a breach of justice, so what is followed in the international judiciary is the need to appoint Honorable witnesses are through the court, provided that they are subject to the protections established before the international criminal courts that protect them from any influences or pressures that affect their technical work and their testimony before the court. The expert also requires the availability of experience in the expert, as the person is not an expert in a specific field without being He possesses what qualifies him to be an expert, and this matter is appreciated by the court, as the competence of the expert is what leads to confidence in the evidence and its legitimacy, so the expert must have experience of a special kind and training at a certain level, so that the evidence has a great degree of credibility and then reassurance about it.

The international criminal courts require that the expert submit a report that includes his actions and the results he has reached, and the report is discussed in the presence of the expert by the parties to the case, and this is what is applied in the Latin system, in contrast to what is followed under the Anglo-Saxon system, especially in English law, whereby the expert is not allowed to submit a written report, but the expert is subject, like other witnesses, to the questioning system. As for the authenticity of the expert opinion, it is subject, like the rest of the evidence, to the court’s discretion, as international courts are not bound by the opinions of experts. To take it, it has the right to reject it completely, and it has the right to rely on parts of it only. Although the procedural rules and the rules of evidence of the International Criminal Court have emphasized that the court is obligated to explain the reasons for the decision it makes on matters of evidence.

The international criminal courts follow the rule of (expert expert judge) according to the nomenclature used in the Latin system. Or (expert judge in the case) according to the designation used in the Anglo-Saxon system.

In this, the former Yugoslavia court decided that expert reports are used to prove technical matters, and not to determine the incrimination of a particular accused.

The second branch

Clues: Clues are defined as the deduction of an unchanging matter from a fixed matter. Likewise, it is known as a link between an event and its outcome, in which the evidence of the incident is evidence of the occurrence of its result. It has a rule stipulated in an abstract form, and these are the legal presumptions, and in terms of their authority in evidence, they are divided into conclusive legal evidence whose opposite may not be proven. The clues are one of the technical means aimed at clarifying the truth and achieving justice between the conflicting parties, and at the same time it is one of the rational tools that the international judge uses in the matter of translating the mental legal principles into a reality that settles the parties’ disputes, and despite this importance, the dispute arose . In international
jurisprudence on the existence of legal presumptions in international law. As an opinion tended to deny their existence in international law on the grounds that there is no authority superior to states that can determine the legal presumptions and impose their application, in when another opinion went to the contrary, based on the fact that the evidence represents one of the method of proof before the international judiciary, and it is possible to find its sources in the original and reserve sources of international law. The range to a conclusive legal presumption.

Through our review of the legal texts of the international criminal courts, it became clear to us that they lack any text that includes a legal presumption.

As for the second type of evidence, which is what the trial judge deduces from the circumstances of the case, and individual conclusions are considered in special cases, and these are the judicial evidence. And that there is not the slightest suspicion, otherwise they are signs and Emirates that do not rise to the level of evidence, and therefore it is not permissible to rely on them.

Judicial evidence is considered evidence before the international criminal courts, as there are no legal texts in their statutes preventing it, as long as it falls within the principle of judicial conviction that allows the court to reach the truth by any legitimate means.

It is worth noting that judicial evidence finds its place before international criminal courts in proving the moral element in the crime of genocide, as there is great difficulty in proving this element.

The court of the former Yugoslavia decided that the private intent of the crime of genocide can be proven in the absence of clear and direct evidence from the circumstances of the case, such as the general context or the commission of other criminal acts systematically directed against the group itself, or the extent of atrocities committed, or the systematic targeting of victims because of their affiliation with a specific group, or repeated destructive and discriminatory acts.

The Tribunal of Rwanda also decided that the intent of genocide can be deduced from material acts and, in particular, the massive, widespread and systematic nature of the atrocities ... in the absence of an explicit confession by the accused, his intention can be inferred from a number of factual assumptions.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon and all experiments were carried out in accordance with approved guidelines.

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Prevalence of Bacterial Vaginitis in Women with Recurrent Abortion in Comparison with Normal Pregnant Women

Samira Sherzad Hussien¹, Shahlaa Abd-Alrahman Mohammed², Bushra Mohammed Salih³


Abstract

Across-sectional study was done on a total of 80 deep vaginal swabs (40 women with recurrent abortion and 40 pregnant women as control group) were collected from the September 2019 to the end of November 2019 from inpatients and outpatients women attended to Kirkuk general hospital to evaluate the prevalence of vaginitis due to bacterial causes and its relation with abortion in pregnant women. Vaginal swabs were inoculated in bacterial media whose were prepared and sterilized according to the manufacturer’s instruction. The prepared media were used for isolation, determination of the viable count, identification and susceptibility testing these media were carried out after being solidified. Swabs was inoculated onto MacConkey, nutrient and blood agars. Then the inoculated plates were incubated at 37°C for 24 hr. The included 40 women with recurrent miscarriage with age range (20-44 years), the study showed that 12 of 40 were within the age group 30-39 years and 12 were below 30 years with mean age (31.6 years) and their husbands mean age (35.43 years) and 65% of cases were rural. There was 60% of cases were with history of 3 miscarriage and 18.75% were 4 miscarriage. The study also revealed that majority of cases were parity 3-6. The study also indicated that majority of cases have history of miscarriage in the 1st trimester in pregnancy. The study demonstrated that 55% of women with recurrent abortion have positive HVS culture comparing with 48% of pregnant women (control group). The study showed that 77.27% of women had aborted in the 1st trimester of pregnancy and the lowest rate of abortion 3% was in the 3rd trimester. The study revealed that highest rate of isolated bacteria from the HVS culture of aborted women was Gardenellavaginalis (36.36%), E. coli (27.27%) S. aureus (22.73%) and the higher rates of isolated bacteria from pregnant women were 50% for E coli.

Keywords: Bacterial vaginitis; Gardenellavaginosis; Recurrent abortion; Pregnancy.

Introduction

Vaginitis is the most common gynecological infection among women of fertile age (¹). Bacterial vaginosis (BV) comprises the 50% of the all cases of vaginitis (²). To understand the pathological events related to vaginitis, it is necessary to understand the normal vaginal flora. In normal vaginal flora, there are Lactobacillus species in 95% and facultative anaerobic and anaerobic microorganisms, including: Gardenellavaginalis, Staphylococcus epidermis, Mycoplasma hominis, Streptococcal species, Bacterioides species, Prevotellabivius, Peptostreptococci species, in 5% (³). In most cases of BV, the predominant microbe is the facultative anaerobe Gardenellavaginalis. However, evidence from recent studies of the pathogenesis of BV suggests that this bacterium forms a biofilm in the vaginal epithelium that serves as a “scaffolding” to which other bacterial species adhere in a symbiotic fashion, colonizing the vagina (⁴). Though asymptomatic in at least half of affected women, this polymicrobial condition can produce a thin, white, homogenous discharge with a distinct “fishy” odor (⁵). The changes in the vaginal flora seen in BV are associated with serious sequelae, such as preterm delivery, spontaneous abortion, postpartum endometritis, and increased susceptibility to HIV and other sexually transmitted infections (⁶,⁷). The aim of this study was to evaluate the prevalence of vaginitis due to bacterial causes and its relation with abortion in pregnant women.
Materials and Method

Across-sectional study was done on a total of 80 deep vaginal swabs (40 women with recurrent abortion and 40 pregnant women as control group) were collected from the September 2019 to the end of November 2019 from inpatients and outpatients women attended to Kirkuk general hospital. Collection of vaginal swabs included:

1. The swab package was partially opened.
2. Carefully the swab was inserted into vagina about 2 inches (5 cm) past the introitus and gently rotated for 10 to 30 seconds.
3. When the swab touched the vagina walls and moisture and absorbed the moisture, it was withdrawn without touching the skin.
4. Swabs was delivered to the laboratory within 1 hour of collection.
5. The swabs samples were cultured in blood agar and MacConkey agar for 24 hour\(^8\).

    Media were prepared and sterilized according to the manufacturer’s instruction. The prepared media were used for isolation, determination of the viable count, identification and susceptibility testing these media were carried out after being solidified. Swabs was inoculated onto MacConkey, nutrient and blood agars. Then the inoculated plates were incubated at 37°C for 24 hr.

Results

The included 40 women with recurrent miscarriage with age range (20-44 years), the study showed that 12 of 40 were within the age group 30-39 years and 12 were below 30 years with mean age (31.6 years) and their husbands mean age (35.43 years) and 65% of cases were rural. There was 60% of cases were with history of 3 miscarriage and 18.75% were 4 miscarriage. The study also revealed that majority of cases were parity 3-6. The study also indicated that majority of cases have history of miscarriage in the 1\(^{st}\) trimester in pregnancy, Table 1.

Table 1: General characteristics of women with recurrent miscarriage

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Aborted women (n:40)</th>
<th>Study Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Pathogenic bacteria</td>
<td>22</td>
<td>55</td>
</tr>
<tr>
<td>No bacterial infection</td>
<td>12</td>
<td>45</td>
</tr>
</tbody>
</table>

P. value < 0.01

The study demonstrated that 55% of women with recurrent abortion have positive HVS culture comparing with 48% of pregnant women (control group), Table 2.

Table 2: Distribution of HVS culture in recurrent aborted women and the control group.

<table>
<thead>
<tr>
<th>Results of vaginal swab culture</th>
<th>Recurrent Abortion Women</th>
<th>Pregnant Women (Control)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Pathogenic bacteria</td>
<td>22</td>
<td>10</td>
</tr>
<tr>
<td>No bacterial infection</td>
<td>12</td>
<td>30</td>
</tr>
</tbody>
</table>

P. value < 0.01

The study showed that 77.27% of women had aborted in the 1\(^{st}\) trimester of pregnancy and the lowest rate of abortion 3% was in the 3\(^{rd}\) trimester, Table 3.
Table 3: Distribution of aborted women with HVS positive according to Trimester of abortion

<table>
<thead>
<tr>
<th>Trimester of abortion</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st trimester</td>
<td>17</td>
<td>77.27</td>
</tr>
<tr>
<td>2nd trimester</td>
<td>4</td>
<td>18.18</td>
</tr>
<tr>
<td>3rd trimester</td>
<td>1</td>
<td>4.55</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 1 shows that the highest rate of aborted women have suffer from abortion twice number during their marriage life.

The study revealed that highest rate of isolated bacteria from the HVS culture of aborted women was Gardenellavaginalis (36.36%), E. coli (27.27%) S. aureus (22.73%) and the higher rates of isolated bacteria from pregnant women were 50% for E coli, Table 4.

Table 4: Distribution of isolated pathogenic bacteria among study groups.

<table>
<thead>
<tr>
<th>Isolated bacteria</th>
<th>Aborted women</th>
<th>Control women</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Gardenellavaginalis</td>
<td>8</td>
<td>36.36</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>5</td>
<td>22.73</td>
</tr>
<tr>
<td>E. coli</td>
<td>6</td>
<td>27.27</td>
</tr>
<tr>
<td>Klebsiellaspp</td>
<td>3</td>
<td>13.64</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>100</td>
</tr>
</tbody>
</table>

Discussion

In agreement with these finding, Sundari et al (9) reported in their study that the majority of the sample was reported at first trimester of pregnancy. This result is in agreement with the study of Hassan et al (10) and Ali (11) who reported a similar results. Al-dorri(12) found in a study that aborted pregnant women with Listeria infection most common in 1st trimester (< 12 wk) was 54(60.68%) and at late (12–20 wk) was 35(39.32%). Jamshidi et
al (13) who reported pregnant women with abortion at gestational age of early (< 12 wk) was 54(60.68%) and at late (12–20 wk) was 35(39.32%). Ra’ad et al (14) in a study of vaginitis in married women in Tikrit city found that women with 1st trimester of abortion recorded the highest rate of abortion. In present study, the overall prevalence of vaginal infections (57%) was coherent with several studies done earlier. A study done in Kirkuk found that 33.2% of women with recurrent abortion have positive HVS culture(15). Chambers(16) displayed that 34.7 % of women in India had positive HVS culture. Go VF et al (17) revealed that, the prevalence of vaginal infection in Vietnam was 49.5 %. Bahram et al(18) found that HVS were positive in 27.6% Iranian women. This variation might be methodology difference in isolation and identification of etiologies of vaginal infections. Moreover, environmental factors and difference on the actual study participants might also explain the above discrepancy. Manges et al(19) demonstrated that the most prevalent G. vaginosis bacteria was with rate (45.61%). The study was inconsistence with a study done in Erbil by Mohammed(20) who found a high percentage (46.21%) of E coli in his study. This may be due to the differences of the sites of swabs being taken from the hospital as a whole in Erbil or may be explained by the level of health awareness of both, patients and health staff in different communities (21). Hayat et al(22) and found that causative organisms of vaginitis were E. coli in less than one-third of cases followed by Klebsilla less than one quarter and more than 5% were Proteus. Other studies denoted that G. vaginosis and S. aureus may just be organisms causing local vaginal infection as they did not occur in the endocervix and may not have been responsible for the ascending upper genital tract infection in septic abortions. The result of the current study was supported by several studies done earlier. Carlson et al(23) and Yong et al(24) presented that women who suffer from spontaneous abortion are in 1st trimester and 2nd trimester while some of the women were multigravida had previous stillbirth, preterm birth, multiple birth, and previous miscarriage.

Conclusion:

Bacterial vaginosis was common in aborted women and S. aureus was the most isolated species followed by G. Vaginosis and E. coli.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Kirkuk Health Directorate and all experiments were carried out in accordance with approved guidelines.

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The Power of Exercise to Reduce the Risk Factors of Cardiovascular Disease in Obese Men Patients

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Abstract

Objective: Firstly To assess the incidence of cardiovascular disease (CVD) risk factors in obese men, and secondly to compare the effects of high intensity interval training (HIIT) and moderate intensity continuous training (MICT) of an 8-week exercise intervention on cardiovascular disease CVD risk factors.

Design and Method: Trails comparing (HIIT) and (MICT) in obese men participants aged 42-52 years and subdivided to two groups: first group consisted from 30 individuals subjected to (HIIT) while the second group comprised from 30 volunteers subjected to (MICT). Participants performed 12 weeks of exercise consisting of 30 min of exercise five times a week, and all parameters were repeated following the 12-weeks

Result: Both HIIT and MICT elicited significant (p < 0.05) reduction in body mass index (BMI), waist to hip ratio (WHR), metabolic characteristics such as fasting blood glucose (FBG), fasting insulin and lipids variables, as well as improving in insulin sensitivity and blood pressure, in addition to there were significant decline in c- reactive protein (CRP) in study groups after 12- weeks exercise intervention.

The present results show an inverse relationship between the lipoprotein lipase (LPL) activity and body mass index and observed the activity of this enzyme at baseline was less than those in HIIT and MICT, in addition to the activity of this enzyme In individuals with HIIT group was significantly higher (p < 0.05) than the value in those with MICT group.

Conclusion: There is much information about the impact of physical activity on reduction of cardiovascular disease (CVD) risk factors. This information derives from different population groups where sedentary then, physical activity reduced the risk of coronary heart disease and cardiovascular mortality in patients have one or more from CVD risk factors. Present study have shown that reduction in large risk factors CVD can be achieved by moderate or intense physical activity. The risk factors of CVD included: obesity, glucose intolerance, dyslipidemia, and high blood pressure.

Keywords: Obesity, Risk Factors of Cardiovascular Diseases, lipoprotein lipase activity, C-reactive protein.

Introduction

Cardiovascular disease is a wide term, it is used to describe all circumstances affecting the heart and blood vessels, including coronary heart disease, stroke, heart attack and aortic disease. CVD risk factors can be categorized into two classes: invariable and variable¹. Invariable CVD risk factors are those that cannot be changed. These include age, ethnicity and family history (genetics cannot be changed), among other factors. Variable CVD factors are those that can be lessening or controlled by altered particular habits, by changing certain lifestyle, examples, take off smoking, consumption healthy diet and doing a sport².

Obesity is one of important factors which associated with an increased risk of developing (CVD), particularly heart failure (HF) and coronary heart disease (CHD). The process which explain how obesity increases CVD risk involving the changes in body composition that can alter hemodynamics and effect on heart structure. In addition to adipose tissue produce the Pro-inflammatory
cytokines which can induce cardiac dysfunction and may be promote the formation of atherosclerotic plaques\(^3\).

There are several observations from human and animal researches confirming a beneficial role for exercise in the reduction and treatment of CVD. Sedentary life style and obesity/overweight are not only associated with a number of health correlated with risk factors, but are considered to be independent risk factors for CVD, type 2 diabetes mellitus and hypertension. Clinical experiments confirm that lifestyle mediations (dietary modification and increased physical motion) reduce the risk of impaired glucose tolerance and type 2 diabetes\(^4\). Moreover, epidemiological studies revealed that risk of hypertension enhancement when a person being overweight. Moderate exercise intensity and frequency have hypotensive effects in physical inactivity hypertensive patients. Long term exercise improves endothelium-dependent dilatation in the aorta and strengthening heart arteries, whereas short-term exercise improves endothelial function in coronary conduit arteries\(^5\).

In addition to, exercise have been related positively with increasing high density lipoprotein (HDL)-cholesterol, and that elucidate why physical activity can have a protective role against coronary heart disease. According to Roussell and Kris-Etherton\(^27\) changing in life style, physical activity and a healthy diet can raise blood HDL-cholesterol by 10%–13%, while training and active motion can independently decrease blood triglyceride concentration\(^27\).

The aim of the present study was to evaluate whether changes in sedentary lifestyle aspects with special moderate to intense exercise, were effected on the reduce levels of multi CVD risk factors.

**Materials and Method**

**Study Design:** In this study, 60 obese patients (BMI>30) aged 42-52 years were recruited during the period April–July 2019 and subdivided to two groups: first group consisted from 30 individuals subjected to (HIIT) while the second group comprised from 30 volunteers subjected to (MICT). participants were required to take part in an 12-weeks exercise intervention program, and complete a series of physiologic and biochemical test profiles before and after the intervention.

All participants had their height and weight, waist and hip circumference, BP (systolic and diastolic), maximal oxygen volume (VO2 max), total cholesterol, HDL-cholesterol, triglycerides, lipoprotein lipase activity and C- reactive protein levels determined before and following exercise training.

The exercise program for both groups consisted of 12-weeks of high intensity interval training (HIIT) for first group and moderate intensity continuous training (MICT) for second group, two type of exercise consisting of 30 min of exercise five times a week.

![Figure (1): Risk factors for incidence cardiovascular disease (CVD)](image-url)
**Blood Biochemistry Analysis:** All blood sampling was carried out under sterile conditions. Blood glucose measurements which included fasting blood glucose, post prandial blood glucose using certain kits from Spinract, Spain, fasting insulin levels using ELISA kit from Calbiotech, USA then determined HOMA-IR by certain equation. In addition to the measurement of blood lipid profiles were carried out, that included total cholesterol, HDL-cholesterol and triglycerides were obtained between 8 and 10 am following a 10-h fast, using kits from Biolabo, France. Estimates of LDL-cholesterol were calculated using the Friedewald equation. The activity of lipoprotein lipase enzyme and C-reactive protein were determined by applied ELISA method by Elabscience, China kit.

**Statistical Analysis:** The statistical analysis was achieved by the statistical package for the social science (SPSS) software for windows, version 20.0. the result were represented as mean±standard deviation (Mean±SD). Paired- sample t test was used to compare variables in same group before and after exercise period and independent- sample t test was used to compare variables between two groups (HIIT)and (MICT) after exercise period. The confidence interval was set at 95%, thus p values less than 5% (p<0.05) were considered statistically significant.

**Results**

A total of 60 participants were classified into two groups based on type of exercise: (HIIT) group (n=30, BMI > 30 kg/m$^2$) and (MICT) group (n=30, BMI > 30 kg/m$^2$). The mean values of the anthropometric parameters in both groups before and after the period of exercise (12-weeks intervention). pre- vs. post-intervention, statistical analysis of the BMI study persons showed highly significant decreases (p>0.005) when compared pre vs. post exercise intervention in two groups as well as present results pointed out to decline in BMI in (HIIT) group than those in (MICT) group.

The comparison results of WHR in the two groups demonstrated, in the HIIT group, had an average WHR of 0.820 and MICT an average of 0.819, whilst the two experimental group had significant differences (p=0.000) in WHR between pre and post training. Systolic and diastolic blood pressure were determined in post and pre training intervention, non-significant increase of systolic blood pressure in post training for both groups (HIIT) and (MICT) in comparison with these values in pre training, whereas, significant reduction were recorded in diastolic blood pressure when compared values in before and following 8- weeks of training, while no such results were noted when the systolic and diastolic blood pressure were tested between (HIIT) and (MICT) groups.

Maximal oxygen uptake is dependent on age and gender, and is a widely used as a predictor tool of cardiopulmonary fitness. Figure (2) shows the average of VO2 max values for both groups. For pre-exercise, the mean VO2 max for HIIT and MICT groups was within the poor-fair range of fitness, while, Post the 12-weeks training intervention, the VO2 max values climbed significantly (p < 0.05) for both groups when comparing before and after training. Present study pointed out After 12 weeks of training, the cardiopulmonary fitness of HIIT and MICT groups improved to the fair-good range. Results also showed a main differences between HIIT and MICT, suggesting that MICT had a lower fitness than HIIT. the average of all biochemical variables for both groups before and after the 12-weeks of exercise. A significant decrease in blood sugar levels in pre HIIT and MICT groups comparing with post HIIT and MICT intervention, while did not show significant differences between post HIIT and MICT intervention.

![Figure (2): The average VO2 max values measured in HIIT and MICT group before and after the 12-weeks training](image-url)
In the present study there were significant decreasing of lipoprotein lipase (LPL) in post HIIT and MICT group compared to pre training intervention, no significant were observed when post HIIT and MICT groups compared together (p=0.85). a significant decrease (p=0.000) of CRP levels in post HIIT and MICT groups when compared with those pre training intervention in both groups.

Fasting insulin level seemed to be significantly reduction (p=0.000) in the samples of pre HIIT and MICT intervention group comparison to pre training intervention, additionally there were significant variation between HIIT and MICT groups. The insulin resistance level was represented by the HOMA-IR and fasting insulin/glucose ratio (FIGR). The HOMA-IR values in HIIT and MICT groups baseline were 3.009± 1.45, 3.033±1.566; respectively. Results of t-test showed that IR in the HIIT group after exercise intervention was less than those in MICT group, and the differences were statistically significant (p<0.05). FIGR levels in the post HIIT and MICT groups seemed to be within their levels in the pre HIIT and MICT groups. Results of the present work failed to find significant differences in the levels of FIGR between post training in both groups HIIT and MICT.

The study reported a significant decreasing in the levels of cholesterol, triglyceride, low density lipoprotein binding cholesterol (LDL-C) and very low density lipoprotein binding cholesterol (vLDL-C) after 12 weeks of exercise intervention in HIIT and MICT groups when comparing with their levels before exercise intervention, in addition to there were significant variation in these levels of lipid parameters between post HIIT and MICT intervention. The present study shows that high density lipoprotein binding cholesterol (HDL-C) in serum of post HIIT and MICT groups are significantly increased (p<0.05) compared with that of pre exercise intervention in both groups HIIT and MICT.

**Discussion**

This study compared the effects of short-term HIIT and MICT programs on BMI, WHR, VO_{2}MAX, blood pressure, and several metabolic characteristics, such as fasting blood glucose and insulin in addition to blood lipoprotein levels in sedentary adults. The main findings were that both HIIT and MICT programs significantly improved the BMI, WHR, and diastolic blood pressure. However, there were only significantly improved in the HIIT group following 12 weeks of training.

Almost of the participants in present study were obese (BMI ≥ 30) as compared with a large waist circumference characteristic accumulation of the lipid layer in the abdomen (apple pattern), meaning they were classified as obese individuals. Central obesity as a marker of body fat, which can estimated by measuring body mass index (BMI) and waist circumference (WHR) that in turn might effectively predict the risk of metabolic syndrome. Obesity seems to be predominant underlying risk factor not only for the development of metabolic syndrome but also other cardiovascular risk factors. Results of many studies indicated for increasing in body weight and BMI associated with the elevation of ischemic heart disease in several populations. The present finding agreed with the study which mentioned to fact that HIIT has greater effectiveness on weight loss than MICT, indicating that exercise intensity have efficacy in regulation body composition and local fat exhaustion. 

HIIT is superior to MICT in enhancing the secretion of catecholamines, adrenalin, noradernalin, and growth hormone (GH), which elevate fat decomposition, to obtain effective weight loss.

Increasing evidences which elucidate that high blood pressure is associating with mortality and CVD. participating in training programs have been recommended as an effective non-medication approach to improve blood pressure, in the same regards, the present study showed that four weeks of HIIT and MICT programs decreased diastolic blood pressure in physically inactive adults. Other study demonstrated a mean reduction from pre- to post-intervention of 3.6 and 3.3 mmHg for resting diastolic bp in the HIIT and MICT intervention with no differences between these programs.

Exercise is an effective method to reduce insulin levels, HIIT intervention was more effective in reduction FBG and insulin resistance compared with MICT training. several studies demonstrated that HIIT can trigger the expression and translocation of glucose transporter 4 (GLUT4) on skeletal muscle cell membrane surfaces more than MICT. Over the last 6 ~ 19 years that the regulating and improving insulin resistance will diminishing without physical activity. thus HIIT can promote insulin transportation and insulin tolerance. Ostman et al 2017 reported the lessening in the FBG of patients with insulin resistance syndrome after 16 weeks of continuous training or
intermittent exercise. Gayda et al.2013 noticed that intermittent exercise is effective in the same way of continuous exercise reduction of FBG in patients with chronic heart failure. Obese individuals suffered from lipid metabolism abnormalities, then leads to raising risk of CVD. Trainings are known as an economic and efficient method to reduce fat accumulation, however, the previous results comparison between HIIT and MICT programs, indicated no significant variations in their effects on TG, TC, LDL, HDL. Other studies revealed no significant difference in the levels of TC, HDL, LDL, triglycerides, and C-reactive protein between HIIT and MICT. The effects of exercise on blood lipid levels in persons with obesity depend on blood lipid levels before training, training intensity, training duration, body fat, calorie intake, metabolic rate and. Several studies have shown that exercise stimulate fat decomposition especially HIIT and MICT are more effective method to reduce TC, as well as the outcomes of this study established that accumulation of LDL inside the blood vessels as a major cause of arteriosclerosis. Our results suggest that trainings especially HIIT help in control on the obesity, reduction the risk factors of CVD, then helping to prevent the development of CVD in obese individual

The main role of lipoprotein lipase is binding to the capillary endothelium of most tissues, to metabolize triglycerides in circulating system. Free fatty acids produced by this action, then uptake by peripheral tissues. Most studies report that aerobic exercise increases LPL enzyme expression and activity in postheparin plasma. Another sites of LPL activity include skeletal muscle, where lipolysis produce fatty acids that can be oxidized as an energy source, and adipose tissue, and adipose tissue where fatty acids released from circulating lipoproteins by LPL are reesterfied and stored as triglycerides. The Investigators in animal have generally identified increases in skeletal muscle LPL activity and decreases in adipose LPL with exercise, but human studies are indicated that exercise promote increases in LPL activity in both tissues. Muscle is the main place of triglyceride removal in humans, and if LPL is central to this process, LPL-stimulate lipolysis in muscle, wherefore, may be a basic factor in the generation of high-density lipoprotein-cholesterol (HDL-C) . In addition to, the catabolism of triglyceride-rich lipoproteins, raising the generation of HDL-C and HDL2-C in exercising human muscle. There are much evidences that fasting lipid alterations occur in response to exercise due to the stimulate of adipose tissue LPL activity, which correlated with weight loss, so in the morbid obese, weight loss is combined with increased LPL expression in adipose tissue.

A metabolic abnormalities in obesity patients associated with increase acute-phase response. C-reactive protein (CRP), is the important component of acute-phase proteins and considered a sensitive and major marker of bacterial infection, physical tissue damage, and other inflammatory conditions. CRP is controlled by the proinflammatorycytokines including interleukin-1 (IL-1), tumor necrosis factor-a (TNF-a), and interleukin-6 (IL-6), which produced by hepatocytes. Recent researches provide a proof that inflammation might play a role in the incidence of cardiovascular disease, CRP with other inflammatory markers being regarded as indicators of atherothrombotic disease.

Conclusions

There is much information about the impact of physical activity on reduction of cardiovascular disease (CVD) risk factors. This information derives from different population groups where sedentary then, physical activity reduced the risk of coronary heart disease and cardiovascular mortality in patients have one or more from CVD risk factors. Present study have shown that reduction in large risk factors CVD can be achieved by moderate (MICT) or intense (HIIT) physical activity. The risk factors of CVD included: obesity, glucose intolerance, dyslipidemia, and high blood pressure all of these parameters improving in good state. In addition to, the present research demonstrated that physical achievement is inversely correlated with levels of LPL and inflammatory marker (CRP) in obese patients and improve this parameters values after exercise programs.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Chemistry Department and all experiments were carried out in accordance with approved guidelines.

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The Impact of Breastfeeding on the Total Duration of the Third Stage of Labour among Women Attending Maternity Teaching Hospital in Sulaimani City

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Abstract

Background: Quick breastfeeding during the third stage of labour is considered the safest and most effective intervention to reduce the blood loss associated with labour, as it can naturally release the oxytocin to stimulate the uterine contraction. These contractions make it easier to dislodge the placenta and help reduce the total duration of the third stage of labour.

Aim of the Study: To evaluate the impacts of breastfeeding immediately after birth for the total duration of the third stage of labour.

Study Design: A quasi-experimental study, post-test only control design.

Material and Method: 300 pregnant women from the labour ward in their third stage of labour participated in this study, carried out between 26th of February 2020 and 30th of July 2020. Samples were selected by using a convenient sampling technique through the structured observation record sheet, onto which the beginning of breastfeeding time and placental delivery was recorded. The data were analyzed using descriptive and inferential statistics.

Results: Among the 300 mothers (34%) had delivered the placenta within 5 minutes, (46%) within 8-10 minutes, (13.3%) within 11-13 minutes and (6.7%) had 14-16 minutes in the experimental groups. While, in the control group the duration was longer (46.7%) between 11 and 13 minutes, (20%) within 14 and 16 minutes.

Conclusion: The study results show that early initiation of breastfeeding is an effective intervention to reduce the total duration of the third stage among the mothers during the third stage of labour.

Keywords: Impact, Immediate breastfeeding, Third stage of labour.

Introduction

Pregnancy and childbirth are physiologic processes with their developments specific to each woman, and under normal circumstances, they proceed without any problems1,2. The childbirth is a celebrated event worldwide and is usually have four stages, when the cervix is fully dilated is named as dilatation stages or first stages, in the second stages the born of the baby and in the third stages the placenta is delivered, final the fourth stages is the recovery stages3. A mother’s milk is the first and the most essential gift for the baby. Human milk is capable of providing for all the nutritional requirements of the infant and boosts the immune defenses of the suckling baby to protect it against a series of childhood diseases. The terms “suckling” and “nursing” are used interchangeably with the term “breastfeeding”, all of which refer to the act of feeding an infant or a baby with breast milk by holding the baby to the female human breast who proceeds to suck the milk out of it4. In the third stage of the labour (TSoL), uterus muscles contract sharply and the placenta begins to be separated from the uterus wall. This third stage can naturally carry out
passively or actively with human interaction. No matter which version takes place, the process is associated with a certain amount of blood loss. The amount of blood lost is primarily based on the duration of the separation process. That being said, any deficiency in the uterus muscle contractions would result in lack of uterine tonus, which in turn prevents it from contracting fully. This lack of contraction will prevent blood vessels from constricting fully and will result in more severe blood loss. Any unexpected and uncontrolled bleeding in this third stage might cause a serious health risk to the mother, and may even lead up to mortality. It has been noticed by competent midwives that, if the mother breastfeeds during this exact period, and if proper active management to the labour is provided, less blood will be lost overall.

The physical and cognitive interactions taking place during breastfeeding causes the secretion of oxytocin in the mother, which promotes the release of milk into the breast, from where it can be excreted through the nipple. This secretion of oxytocin is often accompanied by contractions in the uterus as well. It is believed that such uterine contractions can help reduce the bleeding that takes place in the TSoL. Combined with the shortening of the period, the additional contractions in the uterine muscles lead to less blood loss and lowers the risk for the mother associated with the labour. Nonetheless, ensuring increased levels of breastfeeding practices is employed worldwide has been decided as a global health goal for all nations, since human milk carries numerous unique components that are beneficial for the baby. In addition to being the most natural and beneficial nutritional source for the baby, mother’s milk also helps establish a strong foundation of health for it that will last its entire life. It has been reported breastfeeding alone can cause a 13% reduction in infant mortality rate. Because it helps reduce the blood loss due to labour, speeds up the separation of the placenta, and helps establish a bond between the mother and the baby, it is believed that placing the baby straight to its mother’s breast right after delivery is good practice. In this practice, many professionals believe the injection of syntometrine to stimulate womb contractions is unnecessary. This study was performed to evaluate whether immediate breastfeeding was sufficient in this regard.

**Material and Method**

**Study Population:** 300 pregnant women who are beyond their 37th week of gestation and belong to different age groups. The study was conducted between the 26th of February 2020 and 30th of July 2020. Inclusion criteria for selection of pregnant women were to be between 38th and 42nd weeks of gestation, to be pregnant with a singleton, to have a live foetus, and to be undergoing vaginal delivery with or without an episiotomy. Mothers also had to be without any complication during antenatal and intranatal period.

**Ethical Approval:** The study was approved by the ethical committee of the University of Sulaimani/ College of Nursing and by the ethical review committee of the Maternity Teaching hospital. The data for the study was collected through interviews. Verbal consent was taken from each pregnant woman.

**Data Collection:** Data collection was performed by direct interviews with the study participants. For this, a questionnaire was constructed which surveyed the socio-demographic characteristics, any previous obstetric history, and characteristics and duration of the TSoL.

**Data Collection Procedure:** All participants for the survey were selected using the convenient sampling method. These were then separated into two groups of 150 as the experimental and control groups from the Maternity Teaching Hospital. The Apgar scale was evaluated one minute after the delivery of the baby. The face of the baby was cleaned, who was then wrapped in sterilized linen cloth and placed into its mother’s breast. Helping the baby reach the areola, proper suckling was ensured during the entirety of the TSoL. After that, the time of placenta separation was noted in both groups, and documented in observation record sheet it includes time of delivery, duration of placental separation and lengthening of the cord, expulsion of the placenta on the third stage of labour.

**Statistical analysis:** Once the surveys and labour data were gathered, they were entered into an excel spreadsheet, and were analyzed using the SPSS software, version 25. “Chi-square test of association” was used to evaluate the nominal distribution of data. Fisher’s exact test was used in cases where the expected count >20% of the excel cells collective achieved a score of <5. Student’s t-test of two independent samples was used to compare two means. Binary logistic regression analysis was used to show the independent effect of breastfeeding. A p-value of ≤ 0.05 was considered statistically significant.
Limitations of the Study: Recording data on observation sheet was the difficulty that fell during the study.

Results

Table 1: shows that the highest proportion (53.3%) of the group was aged between 20 and 29 years, and only 3% was aged ≥ 40 years. It is evident that participants in the control group were older compared to the women of the other group as around 60% of them were aged 30 years or more, compared to the 19.3% of women of the experimental group (p<0.001). The average age of the women in the control group (30.77 years) was significantly (p < 0.001) higher than the mean age of the experimental group (24.52 years). The age of marriage of the control group was found to be higher than that of the experimental group (p<0.001), and the difference was statistically meaningful. The age of marriage of 28.7% of the women in the control group was 25 years or more compared to 9.4% of women of the experimental group. The findings show that no statistically significant variations are present between the groups regarding the educational level and residency.

<table>
<thead>
<tr>
<th>Table 1. Association of socio-demographic characteristics between two groups.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Study Group</strong></td>
</tr>
<tr>
<td>No. (%)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
</tr>
<tr>
<td>&lt; 20</td>
</tr>
<tr>
<td>20-29</td>
</tr>
<tr>
<td>30-39</td>
</tr>
<tr>
<td>≥ 40</td>
</tr>
<tr>
<td>Mean (±SD)</td>
</tr>
<tr>
<td><strong>Age of marriage</strong></td>
</tr>
<tr>
<td>&lt; 20</td>
</tr>
<tr>
<td>20-24</td>
</tr>
<tr>
<td>25-29</td>
</tr>
<tr>
<td>≥ 30</td>
</tr>
<tr>
<td><strong>Education</strong></td>
</tr>
<tr>
<td>Illiterate</td>
</tr>
<tr>
<td>Read and write</td>
</tr>
<tr>
<td>Primary</td>
</tr>
<tr>
<td>Secondary</td>
</tr>
<tr>
<td>Institute and college</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
</tr>
<tr>
<td>Housewife</td>
</tr>
<tr>
<td>Employed</td>
</tr>
<tr>
<td>Free work</td>
</tr>
<tr>
<td>Student</td>
</tr>
<tr>
<td><strong>Residency</strong></td>
</tr>
<tr>
<td>Urban</td>
</tr>
<tr>
<td>Rural</td>
</tr>
</tbody>
</table>

*By Fisher’s exact test. **By Chi-square test. †By t-test for two independent samples.
Table 2. Past obstetrical history among experimental and control groups.

<table>
<thead>
<tr>
<th>Study Group Control Group Total</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parity</strong></td>
<td></td>
</tr>
<tr>
<td>Nulliparous</td>
<td></td>
</tr>
<tr>
<td>No. (%)</td>
<td></td>
</tr>
<tr>
<td>71 (47.3)</td>
<td>41 (27.3)</td>
</tr>
<tr>
<td>Multiparous</td>
<td></td>
</tr>
<tr>
<td>No. (%)</td>
<td></td>
</tr>
<tr>
<td>79 (52.7)</td>
<td>109 (72.7)</td>
</tr>
<tr>
<td><strong>Previous breastfeeding</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>No. (%)</td>
<td></td>
</tr>
<tr>
<td>44 (29.3)</td>
<td>57 (38.0)</td>
</tr>
<tr>
<td>No</td>
<td></td>
</tr>
<tr>
<td>No. (%)</td>
<td></td>
</tr>
<tr>
<td>106 (70.7)</td>
<td>93 (62.0)</td>
</tr>
<tr>
<td>If no</td>
<td></td>
</tr>
<tr>
<td>Formula feeding</td>
<td></td>
</tr>
<tr>
<td>No. (%)</td>
<td></td>
</tr>
<tr>
<td>9 (26.5)</td>
<td>11 (20.4)</td>
</tr>
<tr>
<td>Mixed feeding</td>
<td></td>
</tr>
<tr>
<td>No. (%)</td>
<td></td>
</tr>
<tr>
<td>25 (73.5)</td>
<td>43 (79.6)</td>
</tr>
<tr>
<td><strong>Gestational age</strong></td>
<td></td>
</tr>
<tr>
<td>38-40</td>
<td></td>
</tr>
<tr>
<td>No. (%)</td>
<td></td>
</tr>
<tr>
<td>146 (97.3)</td>
<td>143 (95.3)</td>
</tr>
<tr>
<td>&gt; 40</td>
<td></td>
</tr>
<tr>
<td>No. (%)</td>
<td></td>
</tr>
<tr>
<td>4 (2.7)</td>
<td>7 (4.7)</td>
</tr>
<tr>
<td><strong>Mode of delivery</strong></td>
<td></td>
</tr>
<tr>
<td>NVD with or without episiotomy</td>
<td></td>
</tr>
<tr>
<td>No. (%)</td>
<td></td>
</tr>
<tr>
<td>147 (98.0)</td>
<td>146 (97.3)</td>
</tr>
<tr>
<td>Instrumental delivery</td>
<td></td>
</tr>
<tr>
<td>No. (%)</td>
<td></td>
</tr>
<tr>
<td>3 (2.0)</td>
<td>4 (2.7)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
<tr>
<td>No. (%)</td>
<td></td>
</tr>
<tr>
<td>150 (100.0)</td>
<td>150 (100.0)</td>
</tr>
</tbody>
</table>

*By Fisher’s exact test. †By the Chi-square test.

Table 3. Characteristics of the third stage of labour with two groups.

<table>
<thead>
<tr>
<th></th>
<th>Experimental</th>
<th>Control</th>
<th>Total</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Active management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>148 (98.7)</td>
<td>145 (96.7)</td>
<td>293 (97.7)</td>
<td>0.448*</td>
</tr>
<tr>
<td>No</td>
<td>2 (1.3)</td>
<td>5 (3.3)</td>
<td>7 (2.3)</td>
<td></td>
</tr>
<tr>
<td><strong>Uterotonic drugs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>147 (98.0)</td>
<td>142 (94.7)</td>
<td>289 (96.3)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>3 (2.0)</td>
<td>8 (5.3)</td>
<td>11 (3.7)</td>
<td>0.125†</td>
</tr>
<tr>
<td><strong>Cord traction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>85 (56.7)</td>
<td>76 (50.7)</td>
<td>161 (53.7)</td>
<td>0.297†</td>
</tr>
<tr>
<td>No</td>
<td>65 (43.3)</td>
<td>74 (49.3)</td>
<td>139 (46.3)</td>
<td></td>
</tr>
<tr>
<td><strong>Cord clamping</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>136 (90.7)</td>
<td>140 (93.3)</td>
<td>276 (92.0)</td>
<td>0.395†</td>
</tr>
<tr>
<td>No</td>
<td>14 (9.3)</td>
<td>10 (6.7)</td>
<td>24 (8.0)</td>
<td></td>
</tr>
<tr>
<td><strong>Fundus massage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>105 (70.0)</td>
<td>117 (78.0)</td>
<td>222 (74.0)</td>
<td>0.114†</td>
</tr>
<tr>
<td>No</td>
<td>45 (30.0)</td>
<td>33 (22.0)</td>
<td>78 (26.0)</td>
<td></td>
</tr>
<tr>
<td><strong>Placenta</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivered</td>
<td>150 (100.0)</td>
<td>150 (100.0)</td>
<td>300 (100.0)</td>
<td>NA</td>
</tr>
</tbody>
</table>
Table 3 presents the characteristics of the TSoL as follows: Active management (97.7%), administration of a uteronic drug (96.3%), cord traction (53.7%), cord clamping (92%), and fundus massage (74%). The placenta was delivered in all the women. Regarding the time of the day, the majority (82.3%) of the women in the study delivered during the morning hours. The difference between the experimental and control groups regarding any of the mentioned characteristics were statistically insignificant (p > 0.05), as presented in Table 3.

Table 4. Association of the duration of the third stage of labour between study groups.

<table>
<thead>
<tr>
<th>Duration of the third stage (minutes)</th>
<th>Experimental</th>
<th>Control</th>
<th>Total</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%)</td>
<td>No. (%)</td>
<td>No. (%)</td>
<td>&lt;br&gt;</td>
</tr>
<tr>
<td>5-7</td>
<td>51 (34.0)</td>
<td>30 (20.0)</td>
<td>81 (27.0)</td>
<td>&lt;br&gt;</td>
</tr>
<tr>
<td>8-10</td>
<td>69 (46.0)</td>
<td>20 (13.3)</td>
<td>89 (29.7)</td>
<td>&lt;br&gt;</td>
</tr>
<tr>
<td>11-13</td>
<td>20 (13.3)</td>
<td>70 (46.7)</td>
<td>90 (30.0)</td>
<td>&lt;br&gt;</td>
</tr>
<tr>
<td>14-16</td>
<td>10 (6.7)</td>
<td>30 (20.0)</td>
<td>40 (13.3)</td>
<td>&lt;br&gt;</td>
</tr>
<tr>
<td>Total</td>
<td>150 (100.0)</td>
<td>150 (100.0)</td>
<td>300 (100.0)</td>
<td>&lt;br&gt;</td>
</tr>
</tbody>
</table>

Note: p-value was calculated by the Chi-square test.

The duration of the third stage of labour was longer in the control group where it is evident that the duration was between 11 and 13 minutes and between 14 and 16 minutes among 46.7% and 20% of the women in the control group, respectively, compared with 13.3% and 6.7% of the women of the experimental group (p < 0.001), as presented in Table 4.

Discussion

Three hundred women were included in the study. These women were placed either in the experimental group (n=150) who breastfed their babies during the TSoL or into the control group, (n=150) who did not breastfeed their babies during the labour.

In the present study, 66.7% of the participants in the experimental group were in the age group of 20 to 29 years, and most of them were housewives (88.7%). This distribution is consistent with the study conducted by Atiya K. Mohammed, 2020, who insisted the necessity for complete pregnancy and postnatal health recommendation for these women as a result of exposure to work outside the house provides ladies higher possibilities of contact with an experienced person and acquire valuable health and social information.

The present results show that there were no significant correlations between immediate breastfeeding and the educational level and residency. Similarly, Dashti et al (2010) reports that there no correlation exists
between the breastfeeding start point and any of the demographic properties they have investigated. On the other hand, a study performed in Egypt in 2018 report findings that a correlation exists between educational level and residential status of the participants with prompt breastfeeding. In the present study, (47.3%) of participants in the experimental group had primigravida, and 79 (52.7%) had multigravida. One-third of the women in the whole sample (33.7%) had a history of the previous breastfeeding. In the experimental group, the majority of subjects were on the 38th – 40th weeks of gestation, and nearly all parturient women (n=147, 98%) had a normal vaginal delivery. These results are consistent with the reports of numerous similar studies.

Our findings show that nearly all parturient women were provided with active labour intervention during the TSoL our, with n=148 (98.7%) and n=145 (96.7) respectively between two groups. In contrast, a quantitative study conducted in Sri Gokulam Hospital and Vijaya Hospital in Salem, where 60 parturient women were selected and separated into two groups of 30 members each (control and experimental), none of the women were provided with active management during the TSoL. The findings of the current study show that all participant women of both groups completely delivered the placenta (100%). ICM and FIGO have expressed that: “Every attendant at birth needs to have the knowledge, skills and critical judgment needed to carry out active management of the third stage of labour and access the needed supplies and equipment.”

**Conclusion**

Early initiation of breastfeeding during the third stage of the labour decreases the duration of the third stage, as can be seen by the comparison of results for the experimental control groups of our study. Therefore, early suckling is concluded here to be effective in reducing the duration of the TSoL among parturient women.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Maternal Neonatal Nursing department and all experiments were carried out in accordance with approved guidelines.

**References**


13. SHENPAGAVALLI. S. “A Study to Evaluate the Effectiveness of Early Suckling on Third Stage of Labour in parturient Women at Selected Hospital, Salem” M.Sc., Sri Gokulam. 2011.


The Prevalence and Infectivity of 
*Entamoebahistolytica* in Baghdad Province

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**Abstract**

The present study aimed to explore the *Entamoebahistolytica* in 500 patients (human stool) selected from a private laboratory in Baghdad/Iraq during the period from 1st of April 2018 till the 31st of August, by using the iodine stain to detect the stages of parasite in all samples, evaluate the prevalence of the parasite between males and females and to evaluate the relationship of the parasite in selected months of this study. This study showed that the total number of infected patients is 394 from 500 taken sample. The high incidence (81.13%) is occurred in August and the low incidence (76.84%) is occurred in April. This result showed no significant differences appeared between the chosen months of the study (P<0.01). The result of this study showed no significant differences (p<0.01) appeared between the males and females of the study, the number of infected patients are (192 males out of 240 and 202 females out of 260).

**Keywords:** Prevalence, infectivity, *Entamoebahistolytica*, Baghdad province.

**Introduction**

*Entamoebahistolytica* is considered one of the intestinal parasites of the protozoa family which causes severe diarrhea (dysentery) in man.¹,² *Entamoebahistolytica* is considered one of the pathogenic parasites and leads to amoebiasis and considered one of the main causes of diarrhea in developing countries, the parasites have two stages to complete their life cycle, an active phase inside the host and an inactive phase there is outside a host.²

The World Health Organization has indicated that 3.5 billion people have intestinal parasites and about 450 million suffer from these parasites.³

The encapsulated phase (cyst stage) is the infected phase that exits with the droppings of the affected human and contains four nuclei and average 20 µm in diameter. As for the active phase with a size ranging from 10 to 60 µm, it is the one present in the large intestine of the host that causes damage to the intestinal wall and the appearance of blood with diarrhea.⁴,⁵

This parasite is transmitted in several ways, the most important of which is taking the cysts through contamination of water and food, through contact with two people, one of which is infected and the other is intact, contact with affected areas and finally swimming in water contaminated with the cysts of the parasite, clinical symptoms differ from one person to another, that is, the appearance of signs depends on the number of parasites present in the host, in simple cases, no symptoms appear, but in severe cases there is pain in the abdomen and bloody diarrhea.⁶,⁷

There are few reports of confirmed cases of amebiasis in the dog and even less information on amebicides, their dosages and side effects pertaining to animals.⁸

**Material and Method**

The samples were taken from a private laboratory in Baghdad governorate/Iraq during the 1st of April 2018 till the 31st of August. The number of Stool samples were 500, collected from (males and females) and added inside clean plastic bottles and then detected the stages of parasite by Lugol’s Iodine stain.

The preparation of Lugol’s Iodine is by Diluted 1:5 with sterile de-ionized water. (This working solution should be prepared fresh approximately every 3 weeks). Prepare a direct smear of the specimen, Place a coverslip over the sample and examine the wet mount preparation.
for the presence of motile protozoa. The organisms are very pale and transparent and are more easily observed under low light intensity, once the wet mount has been thoroughly examined, a drop of Lugol’s Iodine (working solution) can be placed at the edge of the coverslip, or a new mount can be prepared using iodine alone; examine the slide for the presence of brown parasitic structures.\(^{(9,10,11)}\)

**Result and Discussion**

This study showed that the total number of infected patients were (394) from 500 samples that had been taken and percentage was (78.8\%).

The high incidence was (81.13\%) that appeared in August and the low incidence was (76.84\%) that appeared in April as shown in the Table (1), this result showed a prevalence of parasite in Baghdad and no significant differences between the months during period of this study.

<table>
<thead>
<tr>
<th>Months</th>
<th>Total number of examined patients</th>
<th>Number of positive (+) patients</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>95</td>
<td>73</td>
<td>76.84%</td>
</tr>
<tr>
<td>May</td>
<td>103</td>
<td>80</td>
<td>77.66%</td>
</tr>
<tr>
<td>June</td>
<td>97</td>
<td>77</td>
<td>79.38%</td>
</tr>
<tr>
<td>July</td>
<td>99</td>
<td>78</td>
<td>78.78%</td>
</tr>
<tr>
<td>August</td>
<td>106</td>
<td>86</td>
<td>81.13%</td>
</tr>
<tr>
<td>Total</td>
<td>500</td>
<td>394</td>
<td>78.8%</td>
</tr>
</tbody>
</table>

This study showed that the total number of infected patients were (192 males and 202 females) from 500 samples that had been taken and percentage was (78.8\%). The incidence was (80\%) in males and (77.69\%) in females, that appeared in the Table (2), this result revealed no significant differences between the gender during period of this study (p < 0.01).

<table>
<thead>
<tr>
<th>Number of total examined</th>
<th>Samples infected</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method of examination</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Iodine stain</td>
<td>240</td>
<td>260</td>
</tr>
</tbody>
</table>

| 78.8%                     |

The reason of the absence of significant differences (p < 0.01) between months in this results it’s due to exposure the patients to the bad environment and low hygiene as well as food and water contamination with cyst of *Entamoeba histolytica*.

This research appeared that *Entamoeba histolytica* increased of incidence in hot months (from April to August), that agreed with\(^{(12,13,14,15,16)}\).

The cyst stage of *Entamoeba histolytica* was more active during hot months; our results agreed with\(^{(17,18)}\).

The incidence of this disease in hot months (from April to August) was without any significant variation as a result of the infected stage (cyst) of *Entamoeba histolytica* staying for weeks and resistance of the bad environment without destroyed the cyst besides the sample taken from symptomatic patients within the high temperature.
months and this condition considered good environment to survive the cyst, this study agreed with\(5, 6, 13\).

The reason of the absence of significant differences \((p < 0.01)\) between gender in this results it’s due to exposure both the gender to the same bad environment and low hygiene as well as food and water contamination with cyst of *Entamoebahistolytica*.

This study was disagree with other studies that recorded not important higher differences in proportions of infection between females and males in Baghdad \(19\) and Mosul city\(20\).

The reason for the different incidence of infection between males and females is attributed to the difference between body structure, immunity and addition to the physiology of the body for both genders, e.g. endocrine activity as male bodies are more tolerant than those of females\(21\).

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Pathological Analysis Techniques and all experiments were carried out in accordance with approved guidelines.

**References**


5. Escolà-Vergé, L, Arando M, Vall M, Rovira, Roger; Espasa, Mateu; Sulleiro, Elena; Armengol, Pere; Zarzuela, Francesc; Barberá, María-Jesús. 2017.


Nurses’ Knowledge toward Procedure Nursing Care on Febrile Convulsions Patient in Emergency Unit Teaching Hospital in AL-Nasiriyah City

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Abstract

Background: Febrile convulsion is seizure correlating with fever in the presence of central nervous system or a cut infection electrolyte imbalance child old one month of age without notice. It is commonly infected of (3% - 4%) of children under six years of age.

Objective: The study aims: 1-Assess knowledge of nurses toward nursing care procedure for children with febrile convulsions . 2- Find out- relation between nurses’ knowledge and demographic information (age, gender, marital status, level of education, Years’ experience in the domain pediatric nursing, Years’ experience in the neonatal intensive care unit, participate to training on Febrile convulsions).

Methodology: Descriptive design (cross sectional research design) performed on stage nursing care on febrile convulsions for patient . in order Knowledge Toward Procedure Nursing Care on febrile convulsions patient the study has been conducted for nurses in emergency unit in AL- Nasiriyah City Hospitals including Muhammad AL-Mawsawi pediatric Hospital, Bint Al -Huda Maternity & Children Hospital .starting from (20th September 2019) to (30th of August 2020).

A non-probability (Purposive) sample of (100) nurse from emergency unit in AL- Nasiriyah City Hospitals, including Muhammad AL-Mawsawi pediatric Hospital,Bint Al- Huda Maternity & Children Hospital . consisting study tool of two section : The first section is regarding that demographic characteristic of nurse and the another section is regarding that nurses’ knowledge toward procedure nursing care on febrile convulsions for Patient. The results by using SPSS (Statistical Package for the Social Sciences) software version 25 descriptive data analysis include) frequencies and percentages, mean and standard deviation). inferential analysis (D.F. and Chi-Square) at P value 0.05.

Results: indicates that nurses are within age group of (20 – 29) years were female. The majority of the sample are married . Regarding the level of education the majority participant of them college of nursing. Showed that non-significant correlation between the nurses’ knowledge with their demographic characteristic at (p > 0.05), except their gender and years’ experience them significant.

Conclusion: Majority of the sample are age group of (20-29) years old .There is non-significant correlation between the nurses’ knowledge with their demographic characteristic at (p > 0.05), except their gender and years’ experience in domain of pediatric nursing revealed significant differences relationship with their knowledge.

Keywords: Knowledge, Procedure Nursing Care, febrile convulsions, Emergency unit.
**Introduction**

Febrile convulsion is seizure it is associated with fever in the presence of central nervous system or acute infection electrolyte imbalance in babies older than one month of age without notice. It is commonly infected of (3%-4%) of children under six years of age and one of the commonly reasons for admission children’s hospital is repetition possibility of febrile seizure in the rate of 30%(1).

Results found for children with febrile convulsion is similar of pediatric control from school performance, behaviors and delay to procedure of health care although childhood febrile seizures are very common and generally seen, specially condition with good prognosis also, it’s very frightening and causes to family emotionally traumatic and anxiety when thinking them child febrile convulsion, parent them shocked and in many situation believe the child He could dies. Nurses may low awareness and willingness to provide every the first aid for children who has a seizure, the researchers stress must be measures taken to teaching nurses about febrile convulsion(2).

It is classification recently as complex or simple. Simple febrile convulsion is a general spasm that persists low than 15 minutes with no recurrence within 24 hours. Not It is caused by febrile illness or nerve problems. while complicated febrile convulsions cause one or more of the main symptoms. The symptoms cause a spasm in one arm or leg, and they last more than 15 minutes within 24 hours, it caused neurological malformations, for example, paresis Patient(3).

Febrile convulsions occur with simple disease or any diseases other and cause by fever and also, occurs with commonly diseases for example ear inflammation, colds, influenza, cough and or any Another viral infection. There are another diseases such as kidney diseases, meningitis and pneumonia is less commonly resulting entry into neonatal intensive care unit. Iron deficiency and zinc and some immunization such as (Diphtheria-Pertussis-Tetanus and Measles –Mumps-Rubella), genetic factor, this is importance factors for febrile convulsion. Febrile convulsion may occur before or soon after fever begins for some minutes with possibility of cramping rising with the child’s body temperature (4).

nurses must be provider of the family with hard copy and oral about them reasons of febrile convulsion and the danger the risk of subsequent events. In necessary know to high body temperature this is sign of infection and occurs not disease. Additionally, must to the nurse teach family of diagnosis febrile convulsion, family are fully, aware: the child is more to outgrow febrile convulsions(5).

**Objective of Study:**

1. Assess knowledge of nurses toward nursing care procedure for children with febrile convulsions.
2. Find out relation between nurses’ knowledge and demographic information (age, gender, marital status, level of education, Years’ experience in the domain pediatric nursing, Years’ experience in the neonatal intensive care unit, participate to training on Febrile convulsions).

**Methodology**

Research is descriptive design (cross sectional research design) performed on nursing care on febrile convulsions for patient. in order knowledge toward procedure nursing care on febrile convulsions patient. The study has been conducted for nurses in emergency unit in AL- Nasiriyah city hospitals including, Muhammad AL-Mawsawi pediatric Hospital, Bint Al- Huda Maternity & Children Hospital. A non-probability sample (Purposive) size of the sample (100) nurse from emergency unit in AL- Nasiriyah city hospitals, including, Bint Al- Huda Maternity & Children Hospital, Muhammad AL-Mawsawi pediatric Hospital. Inclusion criteria included all participating nurses work at emergency unit and nurses’ age (under 20 years to above 40 years), and all sex of the participants are females and males, were confirmed by specialists, completeness and reliability of the results. Exclusion criteria include who have not participate in any assess procedure nursing care on febrile convulsions for patient in emergency. the researcher were used data collection during the instrument designed and constructed by based on previous studies. The study final tool consists of two section: First section is regarding that demographic characteristic of nurse and the second section is regarding that nurses’ knowledge toward procedure nursing care on febrile convulsions for patient. Statistical analyses were conduct that use statistical package for social science (SPSS) version (25) data analysis was works through the implementation of descriptive and inferential statistical approaches which were performed by through the calculation the following: frequencies, percentage, (D.F. and Chi-Square) at P value 0.05.
### Results

#### Table (4-1): Distribution of Nurses According to the Demographical Information

<table>
<thead>
<tr>
<th>Information</th>
<th>Variables</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>19</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td>20-29</td>
<td>76</td>
<td>76%</td>
</tr>
<tr>
<td></td>
<td>30-39</td>
<td>19</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>40-45</td>
<td>3</td>
<td>3%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
<tr>
<td>Sex</td>
<td>Female</td>
<td>83</td>
<td>83%</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>17</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
<tr>
<td>Martial status</td>
<td>Married</td>
<td>60</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>40</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
<tr>
<td>Level of education</td>
<td>Secondary nursing school</td>
<td>32</td>
<td>32%</td>
</tr>
<tr>
<td></td>
<td>Nursing foundation</td>
<td>31</td>
<td>31%</td>
</tr>
<tr>
<td></td>
<td>College of nursing</td>
<td>36</td>
<td>36%</td>
</tr>
<tr>
<td></td>
<td>High education of nursing</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
<tr>
<td>Years’ experience in the domain pediatric nursing</td>
<td>Low of 3 year</td>
<td>60</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>3-5 year</td>
<td>25</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Up of 5 year</td>
<td>14</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>99</td>
<td>99%</td>
</tr>
<tr>
<td></td>
<td>Missing system</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
<tr>
<td>Participate in the training of neonatal intensive care unit</td>
<td>No</td>
<td>25</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

The table indicated that (76%) of nurse are within age group of (20 – 29) year and (83%) of nurse were female. With related to marital status, the most of sample that (60%) are married. Related to the level of education, the majority of them are college of nursing and they are (36%) of the sample. Related to years’ experience in the domain pediatric nursing, the results indicated that (60%) have less than three years of experience of pediatric nursing. The majority of the nurses have participate in the training of neonatal intensive care unit and their answer is (Yes), they are (75%) of the sample.

#### Table (4-2): Correlation between nurses’ knowledge and their demographic Information.

<table>
<thead>
<tr>
<th>Demographic information</th>
<th>d.f.</th>
<th>Nurses’ knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pearson Chi-Square</td>
</tr>
<tr>
<td>Age (years)</td>
<td>3</td>
<td>1.850</td>
</tr>
<tr>
<td>Gender</td>
<td>1</td>
<td>6.545</td>
</tr>
<tr>
<td>Marital status</td>
<td>1</td>
<td>1.559</td>
</tr>
</tbody>
</table>
This table show that there is non-significant association among the knowledge of nurses with their demographic characteristics at \( p > 0.05 \), except their gender and years’ experience in domain pediatric nursing revealed significant differences relationship with their knowledge.

### Discussion

The study sample consisted of (100) sample randomly selected nurses. This chapter systematic clarify the results and discussion are sensible with providing the literature and relevant previous studies of the research. The data was analyzed through the application of descriptive and inferential statistics to obtain the objective of the study.

In table (1) regarding to nurses and results of the study are indicated that. The most of individuals are in the age group and this table indicates that (76%) of the nurses fall within age group (20-29) years. The results of the current study agree with Kennard, (2017) which his study results indicated that most of the average age of the participant in nursing was 29 years (6).

The present study showed that (83%) of the nurses are female. The results of the current study agree with Mould,(2012) which the results of his study indicated that (92.6%) are females and (7.4%) are males (7).

Related to the marital status of subject’s, the most of sample (60%) are married. The results of the current study agree with Baran,(2018) which the results of his study indicated that most of the marital status is Married (60.3)Single (39.7) (8).

Regarding the level of education, the majority to college of nursing and they are (36%) from sample. The results of the study results agree with Kennard, (2017) which indication that the majority the participants reported their highest level of nursing education as a Bachelor’s degree (64%) of the sample . Baran,(2018) revealed in his study that the majority of the pediatric nurses in the sample (87.3%) were university graduates (6).

Present study show that (60%) regarding to years’ experience in the domain pediatric nursing have less than three years of experience of pediatric nursing. The results of the present study agree Mediani et al., (2019) which the results of his study indicated that most (38) nurses had experience working in the hospital for more than ten years, but the majority of 58% (42 nurses) had served in the pediatric ward for less than three years (9).

The majority of the nurses participate in the training of the neonatal intensive care unit and their answer is (Yes) and they are (75%) of the sample. This result differ from Mediani et al., (2019),who studied: The most prominent nursing care intensive care unit,(70%) of the nurses participant in this survey did not undertaken any Intensive Care Unite training , while it is found that participation in the teaching program with the sample (No) (9).

### Part II: Correlation between nurses’ knowledge and their demographic variables:

This table showed that there is non-significant association among knowledge of nurses with their demographic characteristics at \( p > 0.05 \), except their gender and years’ experience in domain of pediatric nursing revealed significant differences relationship with their knowledge. The Researchers’ opinion that decrease knowledge for nurses in nursing care of febrile convulsions patient and effected that gender and years’ experience in domain of pediatric nursing.

### Conclusion

Majority of sample are age group (20-29 years old), female, college of nursing. There is non-significant association between the nurses’ knowledge with their demographic information at \( p > 0.05 \), except their
gender and years’ experience in domain of pediatric nursing revealed significant differences relationship with their knowledge.

**Recommendation:** The study recommended that educational program related to nurses’ knowledge toward procedure nursing care on febrile convulsions for patient updating booklets, boosters and pamphlets should be given for nurses to improve and upgrading their knowledge about procedure nursing care on febrile convulsions for patient and providing an educational courses for nursing worked in emergency unite.

**Acknowledgment:** The researchers are very thanks to all the nurses which participated in this study and filled out the questionnaire to study their knowledge about spasticity. Also, researchers are very thanks to the medical staff in all specialties to provide assistance to complete the study.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the pediatric Nursing Department and all experiments were carried out in accordance with approved guidelines.

**References**

In Vitro Study for Nano Hydroxyl Apatite and Chitosan Coated Surface after Immersion in Simulated Body Fluid

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Abstract

Multiple attempts are made to develop coating layers on the implant surface to enhance ossiointegration and support implant functions. The mixture of chitosan with HA prepared by sol–gel process to make organic–inorganic hybrid composite that has the ability to make network with or without covalent bonds between components.

In this study the immersion of titanium disc coated via sol – gel technique by nano-HA and chitosan in simulated body fluid.

Materials and Method: Composite of nano hydroxyapatite/chitosan was prepared by sol – gel technique after preparation of two solutions of calcium nitride and phosphorous pentaoxide, then the magnetic stirrer was used for mixing of these solutions, then 3 mg of chitosan were added to the mixture and the mixture was stirrer for 15 hours to complete the mixing. Dip coated of titanium samples, then the samples were removed and dried by hot air oven, finally samples were sintered at 400°C for one hour. Coated samples were immersed in SBF in closed containers and placed in incubators at temperature 37°C for 30 days.

Analysis of the surface include thickness measurement, X-ray diffraction (XRD), scanning electron microscopy (SEM) and energy-dispersive x-ray spectroscopy (EDX).

The results of thickness measurement showed increase in thickness of the coated layer after immersion in SBF compared with thickness before immersion. The results of XRD showed the appearance of new peaks of HA, SEM showed there are additional accumulation of HA granules on the original coating layer. EDX test showed decreased in the concentration of the main ions component (Ca, Na, P, O and K) when compared with coated samples before immersion in SBF.

Keywords: Dental implant, dip coating, sol–gel, chitosan, hydroxyapatite, nanoparticles, simulated body fluid.

Introduction

The successful of dental implant depends on many factors; implant material, design of implant and design of implant surface (1). Multiple attempts are made to develop coating layers on the implant surface to enhance ossiointegration and support implant functions(2). The coating layer should be biocompatible and osteoconductive properties which mean that it must have the ability to attract osteoblasts to the implant surface and enhance bone formation to secure bone–implant interface(3). The widely use of Titanium and its alloys as dental implant due to its biocompatibility, good strength, resistance to corrosion and has the ability to enhance ossiointegration(4). Many researches have been done to modify titanium implant surface by coating with materials that enhance stabilization and ossiointegration(5). The hydroxy apatite is commonly used as coating for titanium implant; since it is biomaterial that resembles natural teeth and bones(6). Also because of its biocompatibility that enhance growth of bone when implanted inside the body and acceptable mechanical properties so it is widely used as coating
material in plastic and orthopedic surgery\textsuperscript{(7)}. The sol–gel process can be successfully used in the preparation of HA powder or thin film under specific conditions\textsuperscript{(8)}. Sol–gel is successful process to produce nano sized HA\textsuperscript{(9)}.

Several types of sol–gel coatings can be applied for examples; dip coating, spray coating, flow coating and spin coating, making it an ideal technique for production of biocompatible coating\textsuperscript{(10)}. The use of dip coating procedure to apply the coating materials on titanium substrate has the advantage to change surface properties of the substrate and retaining the favorable properties of the coating material to the implant surface to accelerate osseointegration\textsuperscript{(11)}. The mixture of chitosan with HA prepared by sol–gel process to make organic–inorganic hybrid composite that has the ability to make network with or without covalent bonds between components\textsuperscript{(12)}. Chitosan as an amiopolysacharide that gained from alkaline deacetylation of chitin, it is a natural compound that characterized by its biocompatibility, biodegradability, non toxic and osteoconductive, so it has many medical applications; as surgical, reduction of periodontal pocket\textsuperscript{(13)} and as a material for bone grafting\textsuperscript{(14)}. Many attempts have been made to develop chitosan hybrid by making composites that establish ability of forming bone–like apatite in simulated body fluid (SBF)\textsuperscript{(15)}. A cellular (SBF) that have ions concentrations almost similar to that of human plasma, it has the ability to formulate bone apatite on surface of the bioactive materials, therefore it used for in vitro estimation of the bioactivity of the materials and evaluation of the formation of bone like apatite on the implant surface\textsuperscript{(16)}. The procedure of measure the HA formation on the coated surface considered as in vitro procedure that has many advantages over the conventional in vivo procedure in that is simplest, cheaper, quicker procedure, reproducible method and less effected by experimental conditions\textsuperscript{(17)}. Fan et al, 2008 study the apatite formation on natural nano HA/chitosan composite in simulated body fluid (SBF)\textsuperscript{(18)}. Rhee et al, 2012 study the synergic effect of silanol group and calcium ion in chitosan membrane on apatite forming ability in simulated body fluid\textsuperscript{(19)}.

The study aimed to evaluate the formation of new hydroxyapatite after immersion of coated samples in SBF.

**Materials and Method:**

**Preparation of Sol–Gel:** The preparation of nano HA/chitosan composite was achieved according to (Esmael et al, 2020)\textsuperscript{(20)}:

1. A magnetic stirrer (SH – 3/England) was used for mixing of 125 ml of Ethyl alcohol and (10.78 gm) of Calcium nitride which was weighed by electronic balance (Germany, accuracy 0.0001g). Mixing was continued for one hour until completely dissolved of Ca(NO\textsubscript{3})\textsubscript{2} to prepare first solution.
2. Mixing of (5) mg phosphorous petaoxide P\textsubscript{2}O\textsubscript{5} with (125) ml of Ethyl Alcohol for one hour on magnetic stirrer for completion of mixing and preparation of second solution.
3. Mixing of the two solutions was achieved by drop wise of the first solution on the second solution on magnetic stirrer for 2 hours, at this time (5) mg of KOH was added to complete the reaction.
4. Chitosan (3) mg was added to the mixture then mixed on magnetic stirrer for 15 hours.

**Sample Preparation:** Rod of commercially pure titanium grade 2 (Orotig S rl EU company Italy) were cut into circular discs with 10 mm diameter and 2.5 mm in thickness, the by the use of carbide silicone with 500 micron roughness for 15 min to provide mirror polished surface of samples. Then these discs were placed in ultrasound ethanol water bath absolute ≥ 99.8% for 15 min to remove debris and infection, finally discs were washed by distilled water for 10 min and left to dry at room temperature\textsuperscript{(21)}.

**Dip Coating Procedure:** Titanium samples were immersed in the mixture of chitosan/HA sol–gel on slow speed magnetic stirrer and continue for 90 min. to complete precipitation of the coating layer on samples, then the samples were removed from the mixture and dried by hot air oven (0 _ 200 c) (IMS/406, France).

**Heat treatment (Sintering):** The coated samples were sintered by the use of tube furnace (carbolite type MTF 12/38A. BAMFORD, England). Samples were coated at gel stage and sintered for 400°C for 1 hour.

**Preparation of simulated body fluid (SBF):** SBF prepared according to Kokubo's protocol\textsuperscript{(22)} with some modifications, the chemical composition of SBF and there quantity are listed in table (1).

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity gm/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>NaCl</td>
<td>8.036</td>
</tr>
<tr>
<td>KCL</td>
<td>0.225</td>
</tr>
</tbody>
</table>
At room temperature all salts that are listed in table (1) are mixed with 1L of distilled water on magnetic stirrer for 1 hour to ensure completely dissolving of salts in water, and then the PH of fluid was adjusted to 7.4 and checked by PH meter (Germany).

**Immersion of samples in SBF:** Coated samples are immersed in SBF, and then the containers should be closed and placed in incubator (Gallen bamp. England) at temperature of 37°C which is the temperature of human body\(^{(23)}\). And the fluid should be changed at the same time every day to preserve PH level (7.2–7.4) for 30 days, the early nucleation of apatite start after 24 hours of immersion\(^{(24)}\).

**Analysis of the coated layer:** After 30 days the samples were taken out of SBF and rinsed in distilled water and air dried then surface characterized by:

1. **Thickness measurement:** After removing of the coated samples from the SBF the coated layer was measured by microprocess coating thickness gauge (TF–C–UVIS–SR/U.S.A.), the mean of three readings was 90 um when compared with the thickness of coated samples before immersion in SBF was 60 um because of the formation of new layers of HA after immersion in SBF\(^{(25)}\).

2. **X–Ray diffraction analysis:** The chemical composition of crystallographic structure was tested by this analysis test, the indexing peaks based on the joint committee on powder diffraction standards. (JCPDS). The device used (SHIMAZU, XRD–6000, Japan).

3. **Structural surface characterization by SEM:**

   The device used for this test was (SEM TE scan vega 111, Czech). This test analysis was of two parts:

   - **Surface Analysis:** The surface morphology and topographical characteristics of coated sample was performed by scanning electron microscope (SEM) after 30 days of immersion in SBF.
   - **Material characterization:** By Energy dispersive spectroscopy (EDS) by the use of SEM machine for chemical analysis of the sample, it depends on interaction and excitation of x – ray by each sample.

**Results**

**X-ray diffraction analysis:** As appeared in fig. 3.1 a and b compared between coated samples before and after immersion in SBF for 30 days that illustrate the appearance of new peaks of HA. Peaks of HA were indexed according to the standard pattern (JCPDS09-0432).

![Fig. (3.1) X-ray diffraction of tested samples](image-url)
3.2. Scanning electron microscope (SEM): The surface feature of coated samples after 30 days immersed in SBF was compared with surface feature of coated samples before immersion in SBF. As appeared in fig. 3.2 a, b and c there are additional accumulation of HA granules on the original coating layer. The newly formed crystals of HA accumulated as layers of flaks which differed from the manner of accumulation before immersion in SBF which was spherical like granules, these differences in the manner of accumulation due to the differences in the condition, PH and temperature of HA formation. Also the sufficient time of immersion in SBF leaded to completely coverage of titanium samples with layers of HA even cracks areas and appearance of randomly accumulation of layers because of unrestricted formation and growth of HA crystals\textsuperscript{(26)}. This manner of nucleation and formation of new apatite is an indication of bioactivity of the coated sample\textsuperscript{(27)}.

![Fig. (3.2) a SEM (5 um)](image1)

![Fig. (3.2) b SEM (10 um)](image2)
Energy dispersive x–ray spectroscopy (EDX): This test depended on the interaction of x–ray with each element, as seen in fig. (3.3) a the main component of the plate Ca, Na, P, O and K. showed decreased in concentration of these ions when compared with fig. (3.3) b that showed EDX of coated sample before immersion in SBF.

<table>
<thead>
<tr>
<th>Element</th>
<th>Wt%</th>
<th>Wt% Sigma</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>19.20</td>
<td>0.39</td>
</tr>
<tr>
<td>Na</td>
<td>14.11</td>
<td>0.12</td>
</tr>
<tr>
<td>Mg</td>
<td>0.20</td>
<td>0.03</td>
</tr>
<tr>
<td>Al</td>
<td>2.24</td>
<td>0.04</td>
</tr>
<tr>
<td>Si</td>
<td>0.14</td>
<td>0.03</td>
</tr>
<tr>
<td>P</td>
<td>3.34</td>
<td>0.05</td>
</tr>
<tr>
<td>Cl</td>
<td>11.44</td>
<td>0.08</td>
</tr>
<tr>
<td>K</td>
<td>1.86</td>
<td>0.04</td>
</tr>
<tr>
<td>Ca</td>
<td>3.89</td>
<td>0.05</td>
</tr>
<tr>
<td>Ti</td>
<td>41.72</td>
<td>0.23</td>
</tr>
<tr>
<td>V</td>
<td>1.86</td>
<td>0.08</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.00</strong></td>
<td></td>
</tr>
</tbody>
</table>


**Discussion**

Chitosan material recently has been used in dental implant because of its biocompatibility and bioactivity with the natural tissue \(^{28}\). It has the ability to successfully coating of titanium but doesn’t have ability of new apatite formation, therefore hybridization of chitosan with nano HA prepared by sol – gel technique to form chitosan/HA composite to enhance formation of new apatite\(^{29}\). The nano HA prepared by sol – gel technique have hydroxyl groups on its surface that act as nucleation that promote nucleation of calcium and phosphate that facilitate osseointegration\(^{30}\). Coated samples were immersed in SBF to observe nucleation ability of biomaterials\(^{31}\).

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Dentistry and all experiments were carried out in accordance with approved guidelines.

**References**


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Anti-fertility Effects of Ethanolic Extract of Anethumgraveolens in Male Rabbits

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Abstract

Gonadectomy is the most commonly utilized method for permanent contraception in small animals. But some negative side effects can be noticed after surgical castration, therefore finding safe and effective contraceptive substances can be so useful, medicinal plants have a long history of use in traditional medicine. The sperm cell count, motility, live/dead sperm cell ratio, morphology, LH, FSH and Testosterone level were used in this study to evaluate the effect of prolonged administration of ethanolic extract of Anethumgraveolens on male reproductive system in male rabbits. Twelve healthy adult male rabbit were randomly divided in to two groups. The rabbits in group 1 (control group) were administered normal saline (3ml), while rabbits in group 2 were administered ethanolic extract of Anethumgraveolens at dose 0.5 gm./kg B.W for 30 days. The treatment with extract caused significant decrease in sperm motility, live/dead, sperm count, sperm LH, FSH and testosterone level with significant increase (P≤0.05) of abnormal sperm. Histological study showed many pathological changes in testes. On the other hand, Prolonged administration of the extract could be a good source of drug for birth control.

Keywords: Anethumgraveolens, sperm, testes, LH, FSH and testosterone, Rabbit.

Introduction

Gonadectomy is the very commonly used method for permanent contraception in small animals. But several negative side effects can be observed after surgical castration, therefore finding safe and effective contraceptive materials can be very useful, medicinal herbs have a long history of use in traditional medicine. Anethumgraveolens L commonly known as dill belonging to the family Umbelliferae, the generic name Anethum is derived from the Greek word anethon and the common name dill comes from the Norse word dylla or dilla which probably means to soothe¹. Dill an annual herb growing in the Mediterranean region, Europe, central, southern Asia. The plant is used both medicinally and as an aromatic herb and spice and cookery. dill has been used traditionally for gastrointestinal ailments such as flatulence, indigestion, stomachache colic and to tract intestinal gas² it is used anticonvulsant, antiemetic, anticramp (in children) remedy and also recommended topically as a wound healers³, antispasmodic⁴, antimicrobial⁵, cardioprotective⁶, antihyperlipidemic⁷ and antiproliferative activity⁸ the aim of the present study is to evaluating the effect of ethanolic extract of Anethumgraveolens on fertility in male rabbits.

Material and Method

Collection of plant materials and extraction:
Fresh plant of dill was purchased from the local market at Basra-Iraq. The shade dried plant was finely powdered in chemical mixer, 50gm of powder were put in the round bottle flask, 200ml of ethanol (70%) were added to flask and extracted for 12 hours at 70°C the extract was filtered by using whatmann filter paper, then the extract were put in the petridish and left at room temperature under the shade, the collection extracts were kept in tight closed container and stored till using⁹.

Experimental Animals: Twelve healthy adult male rabbit weighting 1000-1500 gm. were used, the animals kept in suitable cages in the animal house of
veterinary medicine college/Basra university, rabbits were acclimated to holding facilities for two weeks prior to the experiment and were fed standard diet and water ad libitum.

The animals were divided into two groups, each group containing 6 animals as follow:

**Group 1:** Rabbits received oral administration of normal saline (3ml) for 30 days (served as control group).

**Group 2:** Rabbits received oral administration of ethanolic extract of *Anethum graveolens* at dose 0.5 gm./kg B.W for 30 days.

**Blood Samples:** At the end of experimental period, blood samples were withdrawn from all animals through cardiac puncture, then the blood samples were put in a screw tube without anticoagulant then centrifuged at 5000 rpm for 15 minutes to get serum for hormonal assay.

**Hormonal Assay:** Serum samples were assayed for testosterone, using the enzyme-linked immunosorbent assay (ELISA) technique using the Fortress kit.

The concentration of FSH and LH were measured by Enzyme Linked Immuno Assay (ELISA) technique according to kit (Monobind Inc. lake forest CA 92630 USA).

**Semen Collection:** The testes were removed along with the epididymis. The caudal epididymis were separated from the testes, blotted with filter papers and lacerated to collect the semen.

**Semen Analysis:** Progressive sperm motility: this was done immediately after the semen collection. Semen was squeezed from the caudal epididymis onto pre-warmed microscope slide 37° and two drops of warm 2.9% sodium citrate was added, the slide was then covered with a warm cover slide and examined under the microscope. The percentage of motile sperms was defined as the number of motile sperms divided by the total number of counted sperms.

**Sperm Viability:** Eosin and Negrosine stain was used to identify the live and dead sperms. The dead sperm stained with the eosin, while the live sperm did not. The stained and unstained sperms were counted and the percentages was calculate.

**Viability = No. of live sperm/No. of sperm count × 100**

**Sperm abnormality:** Sperm suspension 50 µl was put on one end of the clean and warm slide, then a drop of Eosin-Negrosine stain was added, mixed by using glass rod and spreaded all over the slide by another slide. The smear was left to dry and examined under oil immersion. The abnormal sperms were calculated in each slide by examining 200 sperms.

**% Abnormal sperms = No. of abnormal/No. of total sperm x100**

**Sperm Count:** This was done by removing the caudal epididymis from the right testes and blotted with filter paper. The caudal epididymis was immersed in 5ml formal-saline in a graduated test-tube and the volume of fluid displaced was taken as the volume of the epididymis. The caudal epididymis and the 5ml formal-saline were then poured into a mortar and homogenized into a suspension from which the sperm count was carried out using the improved Neubauerhaemocytometer under the microscope.

**Histological Examination:** After removing the testes, they immediately fixed in Bouin’s fluid for 12 hours and the Bouin’s fixative washed from samples with 70% alcohol. the tissues were dehydrated progressively in ascending ethanol concentration then treated with xylene and embedded in paraffin. Five microns thick section of paraffin embedded tissues were mounted on glass slide and stained with heamatoxylin and eosin stain. Sections were examined by mean of light microscope. The sections were made from the middle portion of the testis and the component and functional changes for tissue of testis slide were examined by using light microscope.

**Statistical Analysis:** The mean and standard deviation (mean±SD) were calculated for all values. comparison between the control and the treated group were done using the student’s t-test. Difference were considered statistically significant at (P ≤0.05).

**Result**

**Effect of ethanolic extract of* Anethum graveolens* motility, live-dead sperm ratio and Sperm abnormalities in male rabbits:** The obtained results in table (1) revealed a significant low (P≤0.05) in motility and live- dead sperm ratio in semen of male rabbits.
treated with ethanolic extract of *Anethum graveolens* compared with control group. Moreover, there is a significant increase (P≤0.05) in abnormal sperm morphology of treated group as compared with control group.

**Table (1): Effect of alcoholic extract of *Anethum graveolens* on motility and live-dead sperm and sperm abnormalities in male rabbits**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Control group</th>
<th>Treatment group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motility % Sperm</td>
<td>90.33±1.032 a</td>
<td>54.83±0.752 b</td>
</tr>
<tr>
<td>Live-dead sperm ratio</td>
<td>84.50±0.836 a</td>
<td>21.00±1.264 b</td>
</tr>
<tr>
<td>Sperm abnormalities %</td>
<td>2.58±16.33b</td>
<td>28.83±1.471 a</td>
</tr>
</tbody>
</table>

Values are expressed as mean± SD of 6 rabbit in each group. Means bearing different letters differ significantly (P ≤ 0.05).

**Effect of ethanolic extract of *Anethum graveolens* on LH, FSH, Testosterone level in semen male rabbits:** The mean values of LH, FSH, Testosterone concentration as presented in table (2), the results indicated a significant (P≤0.05) decline in serum above hormones of treated group with ethanolic extract of *Anethum graveolens* compared with control group.

**Table (2): Effect of alcoholic extract of *Anethum graveolens* on LH, FSH and testosterone level in male rabbits**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Control</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>LH (m IU/ml)</td>
<td>2.90±0.24 a</td>
<td>1.63±0.17 b</td>
</tr>
<tr>
<td>FSH (m IU/ml)</td>
<td>1.73±0.15 a</td>
<td>0.71±0.16 b</td>
</tr>
<tr>
<td>Testosterone (ng/ml)</td>
<td>2.53±0.16 a</td>
<td>1.70±0.14 b</td>
</tr>
</tbody>
</table>

Values are expressed as mean±SD of 6 rabbit in each group. Means bearing different letters differ significantly (P ≤ 0.05).

**Sperm examination:** In the control group the sperm was normal Fig. (1,a), but sperms of rabbit treated with ethanolic extract of *Anethum graveolens* showing large number of dead, and large number of different types of abnormal sperms were observed, coiled tail fig.(1,b), big head fig.(1,c) headless tail fig.(1,d) and tailless head fig.(1,e).

Figure 1: (a) Normal sperm in control group, various sperm defects (b-e) were observed. b: coiled tail, c: big head, d: headless tail and e: tailless head in treated group with ethanolic extract of *Anethum graveolens*. 
Histological Examination: Section of testis of rabbit in control group showing normal seminiferous tubules and spermatogenesis (fig. 2), while section of testis of rabbit treated with ethanolic extract of *Anethum graveolens* showing vacuolation of epithelial cells lining of seminiferous tubules (sertoli cells) with suppression of spermatogenesis, congested blood vessels, thickening in capsules, oedema and fibrosis in interstitial tissue with inflammatory cells, degeneration of basement membrane and fragment of nucleolus cells (fig. 3).

**Fig. (2):** Section of testis of rabbit (control), showing normal seminiferous tubules and spermatogenesis.

**Fig. (3):** Section of testis of rabbit treated with extract, showing vacuolation of epithelial cells lining of seminiferous tubules ( ), congested blood vessels (C) with suppression of spermatogenesis and thicken in capsules (T).

**Discussion**

In this study, Male rabbits administered ethanolic extract of *Anethum graveolens* has significant decrease (P ≤ 0.05) in sperm motility, live/dead and total sperm count when compared to the control group, which could be due to the effect of this extract on the cell cycle, cell division and expression of genes necessary for the spermatogenesis. It is also possible that these changes might be as a result of changes in the microenvironment of epididymis and creation of a toxic microenvironment presence in extract, thus influencing sperm count and motility.
In our study showed a significant decrease in the level of FSH and LH and testosterone concentrations in rabbits treated with ethanolic extract of *Anethum graveolens* compared with control group, this indicates that the active ingredients of the extract may alter the pituitary gonadotropins hormones like FSH and LH\(^{17}\), low levels of these hormones decrease endogenous testosterone secretion from the testis depriving developing sperm of the signal required for normal maturation and also it suppress testicular steroidogenesis and spermatogenesis\(^{17}\) since the pituitary-testicular axis is a central regulatory conduit for testicular function that culminates in the production of spermatozoa\(^{18}\).

Alteration of sperm cell morphology caused by *Anethum graveolens* in our study, as a result of a fundamental problem with the process of maturation where abnormal sperm cells are matured from damaged seminiferous tubules\(^ {19}\). Prolonged administration of the extract can be inferred to have harmful effects on the seminiferous tubules which is reflected in this study the high sperm cell abnormalities observed. This observation is supported by histopathological findings of the testes whereby rabbits administered with *Anethum graveolens* exhibit varying degrees of lesions of the seminiferous tubules theses alterations might be caused by cytotoxicity of extract. This study demonstrated that the ethanolic extract of *Anethum graveolens* have antifertility effect on testis of rabbits and could be further investigated for possibility of developing a cheap, acceptable and easy available male contraceptive.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Veterinary Medicine, and all experiments were carried out in accordance with approved guidelines.

**References**

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DNN Based Plant Diseases Recognition Using Classification of Leaf Images

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Abstract

Throughout the area of image processing, the new generation of convolutional neural networks CNNs has produced remarkable performances. The paper reflects on a new approach to the production of utilizing deep convolutionary networks of a model of the identification of plants centered on the picture classification of the surface. Throughout reality, a modern model of teaching and technique allows it simple and fast to introduce the program. With the ability to differentiate the plant leaves from the environment, the engineered model will recognise 13 specific forms of plant diseases from safe leaves. This approach for identifying plant disease was introduced for the first time, according to our understanding. The entire paper outlines all important measures possible for the introduction of this model for disease identification, beginning with the picture collection to establish a database reviewed by agricultural experts. The comprehensive CNN preparation was carried out by Caffe, a fundamental research system developed by Berkley Vision and Learning Center. On average, the experimental results of the built model were 91 to 98 percent reliable for separate class research.

Keywords: DNN, CNN, Leaf Image, Plant Disease.

Introduction

Plant disease is a common threat to yield and quality of global agricultural production and bears responsibility for a significant portion of production costs. It is reported that the loss caused by plant disease accounts for at least a 10% reduction in global food production. Most of disease damage evaluation and treatment are done by farmers in the field with the guidance of plant pathologists. Incorrect diagnosis and pesticide usage are very common. Therefore, the prevention and control of plant disease have always been widely discussed because plants are exposed to outer environment and are highly prone to diseases. Normally, the accurate and rapid diagnosis of disease plays an important role in controlling plant disease, since useful protection measures are often implemented after correct diagnosis. Many recognition and diagnosis method have been proposed by following the pipelined procedures of image segmentation, feature extraction, and pattern recognition. Recognition method following the pipelined procedures have made some progress. But these method are subject to two issues. First, the accuracy of these method greatly depends on the extraction and selection of visible disease features. Specifically, features of visible disease symptoms should be extracted accurately and proper features should be selected. Second, the method following the pipelined procedures are relatively complicated. The presence of noises is largely unavoidable in disease images captured under field conditions, such as uneven illumination and clutter field background. This can severely decrease the quality of the features and affect the results of recognition. Therefore, many efforts are spent on eliminating the noises in conventional method to achieve robust results. The recent trend in the development of computer vision and the use of various machine learning algorithms for plant disease classification has shown promising results in few selected diseases and crops. Evolution of deep Convolutional Neural Network (CNN) based architectures has further enhanced the accuracy of classification significantly.

Literature Review: In this paragraph, different schemes have been proposed in automatic recognition of plant diseases as shown below:

An automatic identification of plant disease utilizing the capability of the digital image-based algorithm. This
algorithm is proposed to cope with various diseases and it is easy to retrain it to include new diseases. Its histogram based structure enables it to be reasonably robust under different circumstances to capture images. The obtained results show that there is still a place for improvement. Many factors such as a considerable number of present disorders, heterogeneity of symptoms associated with the same disease and symptom similarities between different disorders may need the adoption of hybrid techniques combining expert systems, image processing, and other information gathering techniques may be the best hope to beat at least some of the disadvantages present in practice have been presented.

System generative models are used for text and faces combined with standard shaded and textured regions models. This method makes it possible to interact and collaborate with these various versions to classify the images input. This device allows objects to be segmented, faces detected, and text detected and read in urban scenes. This system showed many cases where shaded models helped discover the face and text by explaining the shadows and absence sun glasses. The face and text models, in turn, improved segmentation quality. The present limits of this methodology lie in the standard class of objects that we are presently modelling. This restriction was inspired by the purpose of our software to identify the text and faces of visually disabled persons. But, in principle, this approach can include broad types of objects that have been presented.

The method of detection depended on an analysing of the number of points clusters in combination with CNN as the final classification. The suggested method of evaluating clusters of dots depends on a combination of modelled fuzzy logic and graphics processing. The suggested detection and classification architecture has been tested and compared to other method in this field to demonstrate performance and to draw conclusions for further progress. The detection results combined with CNN enabled us to create a good classification of objects. In the case of face detection utilizing the large database, we attained the rate of about 83%, while in the case of other items such as people about 75%, animals about 55%, and cars about 80%. The performance showed the high potential of the technique proposed. correctly estimate the likelihood of ARX differentials in order to overcome these problems that have been presented.

A support vector machine is used to identify the object of the selected image. The suggested approach of object detection is compatible with KPCA feature vector reduction and detection utilizing the SVM classification system. The extraction method of the feature from the image’s global descriptors. General features are extracted and formed as a feature vector during the process of extracting an image. The vector parameter is developed for full-image training and utilizes KPCA to minimize dimensions. The SVM classifier is equipped using a reduced feature vector. Later test images are provided as input and the Classifier’s output is checked. Back Propagation Neural Network is used for object recognition to show the validity of the SVM Classifier. SVM classifier outperforms from the comparison have been presented.

The Proposed Method

The framework of the proposed system comprises two main phases: a training phase and a classification phase. These two primary phases share the fundamental modules of the system (pre-processing module and features extraction module), as shown in Figure (1).
In the training phase, after the pre-processing and feature extraction steps extracted features vector, for each training sample, the features vectors are saved in the system database. While in the classification phase the system should match these feature vector of input plant leaf image with all vectors listed in the database and return the file name in dataset classifier. Matching and decision steps in the proposed system have been done by using a convolutional neural network (CNN).

**System using Deep Learning Method:** Deep learning neural network plant leaf diseases by image classification method is consist of two main stages:

1. **Enrolment Phase:** In this stage, many steps will be done such as pre-processing, localization, extracted features, (and labelled objects).

2. **Matching Phase:** In this stage, many steps will be used such as pre-processing, localization, extracted features, and matching process. Figure (2) explained the main stages of the proposed system are work and Figure (3) explained the main stages of CNN are work.

![Figure (2): The main stages of the proposed system](image)

![Figure (3): The main stages of CNN](image)
Image Acquisition: Acquisition of the image is always where vision systems begin in order to complete their set task. Once obtained, there are several different processing methods which are able to be used in order to carry out several tasks in regards to the image. The reason why the image acquisition is always the first step in the workflow sequence is that if there is no image, processing is impossible. There are multiple methods to acquire images including but not limited to, the use of cameras or scanners. The image which has been acquired needs to retain all features.

A. Standard Dataset: The images for 6 different diseases and healthy samples of pepper crops were obtained from the Plant Village dataset. The resolution of these images is 256 x 256 pixels and all these images are available in jpeg format. Figure (4) is showing the sample of Standard Dataset (Plant Village Database).

![Figure (4) The sample of the Plant Village dataset](image)

B. Enrolment Phase: At this stage all enrolled features are passed to the system at the same time in order to train the system. The enrolment phase is consisting of other sub steps:

I. Preprocessing Image: The first step in this work is applied pre-processing image to improve the plant leaf images. This technique is used to improve the image for the purpose of showing the image detail well because sometimes the images may be taken in conditions that are inappropriate in terms of light, noise or the size of the image is very large and does not produce good results.

II. Feature Extraction: The most important stage in the identification system is feature extraction from samples such as plant leaf diseases. In the main proposed, the system uses the convolutional neural network (CNN) in which the convolutional layer is in the role of the feature extraction stage. Figure (5) shown architecture of CNN that employed and explain each layer in details:

A. Resize Image for Plant Leaf Diseases: Since the system aims to get a better style and the advantage of the picture of plant diseases will change the size of the image in a manner appropriate to the system. Because artificial neural network inputs are of a certain size, depending on the structure used in the network, the dimensions of the image are adjusted to fit the desired size. To achieve these dimensions, the method is applied to the image so that no information is lost from the image during the resizing process.
Figure (5): Architecture of Convolutional neural network

1. **Convolutional Layer**: Feature extraction layer, it operated by moving mask of weight slide over the original image and dot product multiplication is performed, to produce feature map. Weight is generated randomly, along with many iterations passes through BN, Pooling, RleU Layers, the Weight changes until reaching the best weight for this image, this weight represents the feature.

2. **Batch Normalization Layer (BN)**: This layer is used to increase the speed of the training process and eliminate sensitivity to network initialization, it minimizes a large number of each channel, firstly, the activation of each channel is normalized by subtracting mean of mini batch and divide on standard deviation of mini batch, after that, the layer input is shifted by offset $\beta$, and then scale by factor $\gamma$. This layer is used between the convolutional layer and RleU layer.

3. **Max Pooling Layer**: In order to get rid of excess and unwanted feature, max pooling layer has been employed, so it returns an important feature, it does that by sliding mask with known dimension over feature map that results from previous convolutional layer, but the max is empty, at each stride, the result is the highest value lie under this mask.

4. **RleU Layer**: Since the images are naturally non-linear, and contain non-linear features such as color and border, the rectifier function is applied to increase non-linearity of the image, i.e. RleU layer is used to ensure only robust feature by taking only positive numbers and convert all negative numbers to zero.

5. **Fully Connected Layer**: It’s represent feature vector that hold the most important information for the input, it is gather the feature from all previous convolutional layer during training operation that can be used for classification later. i.e. train hidden layer to give probability of each class.

6. **Softmax Layer**: The output of Softmax layer is probability number ranging between zero and one (0-1), each class has its probability, for example
(0.011, 0.005), give high probability to the candidate class and decrease other classes.

7. **Loss Function Layer:** The loss function is used to determine the loss (error) at each trading epoch, it is also an important factor that the update of weight during backpropagation depends on i.e. it shown the difference between predicted output and true label.

C. **Matching and Decision Stage:** To find the difference between objects coordinate is used Euclidian distance. therefore, determine the decision of the identification system used Matching operation based on Euclidian distance value. each class has its upper and lower limitations when the result of distance lies between the limitations of any class, this means the examined sample belongs to this class.

4. **Experimental Results:** This method of detecting objects works best with objects that display unrepeated patterns of texture, resulting in special matches of features. With uniformly color objects or items containing repeating patterns, this method is unlikely to work well.

a. **Pre-processing stage:** This is the important stage during which the original image is converted to a grayscale image and ROI is extracted as shown in Figures (6).
b. **Convolutional neural network (CNN):** Feature extraction is the essence (core) of the detection Plant Diseases Leaf system, convolutional layer (conv_) in CNN is feature extraction layer, it works by sliding the weight mask over the input image and perform dot product multiplication, the result is called feature map, feature map of first convolutional layer (conv_1) act as input to Batch Normalization Layer (batchnorm_1) which minimize the numbers of feature map (numbers that represent input image after convolutional layer 1) to speed up training process, the output is going forward to first max-pooling layer, that takes only an important feature (highest values) and ignores the other, to increase the difference between individuals feature. Figure shows the output of each convolutional layer on CNN next layer is RReLU that ignore the negative number to ensure only vital feature are remain, so the size of the feature map is minimized.
Conclusion

In this paper, the goal is to automatically identify and detect herbal diseases from leaf images via a new approach of deep education process. The model was established to identify the involvement of leaves and differentiate between stable leaves and 13 diseases, which can be visually identified. The full method was defined from the set of images used for testing and evaluation, the pre-processing and extension of images and finally the deep CNN testing and fine-tuning technique. Numerous experiments have been performed to verify the newly developed model’s efficiency. New picture archive of plants disease was developed with over 3,000 initial photographs taken from Internet sources accessible and expanded by correct transformations to more than 30,000. Regarding specific class checks, the experimental findings obtained accuracy between 91% and 98%. The average finish of the trainer qualified was 96.3%. Fine-tuning revealed no major improvements in average precision; however, the cycle of improvement had a stronger effect on the performance.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of computer science and all experiments were carried out in accordance with approved guidelines.

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Effectiveness of an Educational Program on Nurses’ Knowledge toward Burn Management

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²Ph.D. in Adult Nursing, Dean of Faculty of Nursing, University of Kufa, Iraq

Abstract

Objective: To determine the effectiveness of an educational program on nurses’ knowledge toward burn management and To identify the relationship between nurses’ knowledge toward burn management and their socio-demographic data. Methodology: “quasi-experimental” loaded out to accomplish the golas of the study consisting of (40) nurses at specialized burn center in Al-Najaf City/Al-Najaf Al-Ashraf Health Directorate from October 6th, 2019 to August 23rd, 2020. Results: the study show that there are highly significant differences in the nurses’ knowledge between the study and control groups in the post-test and the program was positive for the nurses’ knowledge about burn care and that there was a good improvement in the nurses’ knowledge between pre and post test.

Keywords: Educational program; nurses; knowledge; burn management.

Introduction

Burn injury occurs as a result of destruction or loss of body tissue resulting from exposure or direct contact to any type of chemical, thermal, electrical, or radiation. Those injuries are one of the world’s most common and debilitating types of trauma. The burn is considered a significant cause of mortality and morbidity worldwide according to the World Health Organization (WHO), accounting for about 180,000 annual deaths.

In Iraq, burns are a common type of injury. According to the latest WHO report, about 6,000 fire-related deaths and 18,000 disability-related burns occurred in Iraq in 2015 (WHO, 2016). Also WHO reports that 3,390 fire-related deaths occurred in Iraq in 2004, which is corresponding to a death rate of 12.3 per 100,000 per year higher than the global average.

A study conducted in Baghdad showed that the incidence of burns increased in the period after the invasion, from 39 to 117 per 100,000 people, which may be linked to an growing number of cases of burns linked to violence. Moreover, another previous study in Basra showed that the death rate was 22%, which was lower than the rate reported in Sulaimaniyah and the city of Baghdad, but it is 8.9% higher than the rate recorded in neighboring countries like Iran.

Total number of burn patients in Iraq reached 92,734 patients annually, and one of the causes of death was related to side effects after burning such as bacterial and viral infections, ulcers and other diseases, which included about 37% of the total number of deaths.

Methodology

A quasi-experimental design was used. The accidental sample consists of 40 nurses, divided into two groups, and each group consists of 20 nurses. One of these two groups underwent the educational program and is the study group. The other group, namely the control, was not subject to the educational program at a specialized burn center in Al-Najaf City/Al-Najaf Al-Ashraf Health Directorate from October 6th, 2019 to August 23rd, 2020. To assess the nurses’ knowledge about burn care, a two-part questionnaire was used, part I regarding the nurse’s demographic data, and the part II consisting of (40) questions in the form of multiple choice question, including their information about the anatomy and physiology of the skin, classification of burns and its complications, and burn management.
Results

Table (1) Statistical apportionment of study and control groups according to their socio-demographic data

<table>
<thead>
<tr>
<th>Sections</th>
<th>Divisions</th>
<th>Study group (Total = 20)</th>
<th>Control group (Total = 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Age/Years</td>
<td>21-30</td>
<td>15</td>
<td>75.0</td>
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<td>31-40</td>
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<td>41-50</td>
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<td>0.0</td>
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<td>Nursing Institute Graduated</td>
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<td></td>
<td>Nursing College Graduated</td>
<td>7</td>
<td>35.0</td>
</tr>
<tr>
<td></td>
<td>Postgraduate</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Economic Status</td>
<td>Satisfied</td>
<td>4</td>
<td>20.0</td>
</tr>
<tr>
<td></td>
<td>Satisfied to some extent</td>
<td>14</td>
<td>70.0</td>
</tr>
<tr>
<td></td>
<td>Unsatisfied</td>
<td>2</td>
<td>10.0</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Single</td>
<td>7</td>
<td>35.0</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>13</td>
<td>65.0</td>
</tr>
<tr>
<td></td>
<td>Divorced</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>Widowed</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>Separated</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Residency</td>
<td>Urban</td>
<td>20</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>Rural</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Years of Experience in nursing</td>
<td>1-9</td>
<td>19</td>
<td>95.0</td>
</tr>
<tr>
<td></td>
<td>10-18</td>
<td>1</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>19-27</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Years of experience in the burn unit</td>
<td>1-4</td>
<td>16</td>
<td>80.0</td>
</tr>
<tr>
<td></td>
<td>5-8</td>
<td>4</td>
<td>20.0</td>
</tr>
<tr>
<td>Training about burn care</td>
<td>Yes</td>
<td>13</td>
<td>65.0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>7</td>
<td>35.0</td>
</tr>
<tr>
<td>No. of Training Courses</td>
<td>1</td>
<td>6</td>
<td>46.2</td>
</tr>
<tr>
<td>(Total No. = 13)</td>
<td>2</td>
<td>3</td>
<td>23.1</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4</td>
<td>30.8</td>
</tr>
<tr>
<td>Place of training</td>
<td>Inside the Iraq</td>
<td>13</td>
<td>100.0</td>
</tr>
<tr>
<td>(Total No. = 13)</td>
<td>Outside the Iraq</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table (1) illustrate the statistical distribution and difference of study and control groups by their socio-demographic data. This table explains that the majority of the nurses in both groups are those with ages between (21-30) years old. In addition, the table shows that the high percentages of participant in both groups (55%) and (60%) are males for study and control groups separately. Concerning residency, the table demonstrates that the entire sample (100%) are urban. About the marital status, the high percentage is (65%) for study group and (75%) of the sample in control group are married. In regard to the level of education, (35%) and (40%) for study and
control groups respectively are graduated from nursing institute and nursing college. Besides, the table shows that the economic status for study group is (70%) and (60%) for control group are satisfied to some extent.

In regard to the years of experience in nursing, the table shows that (95%) of the sample in study group and (75%) of the sample in control group have (1-9) years. Concerning years of experience in the burn unit, (80%) for both groups have (1-4) years’ experience in burn unit. In relation to training about burn care (46.2%) for study group and (61.5%) for control group have only one training course. However, no one of the participants in both groups has a training course outside Iraq and all courses are inside Iraq.

Table (2): Differences in the assessment of knowledge between pretest and posttest study group

<table>
<thead>
<tr>
<th>Groups</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Paired t test (P value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study (Pretest)</td>
<td>3</td>
<td>17</td>
<td>0</td>
<td>24.54 (0.000) HS</td>
</tr>
<tr>
<td></td>
<td>Mean±SD 0.41±0.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study (Posttest)</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean±SD 0.95±0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This table demonstrate differences in the assessment of knowledge between pretest and posttest study group; it shows that there a strong significant difference (P <0.01) among pretest and posttest assessment in the study group. This mean, there is amelioration in the nurses’ knowledge after program.

Table (3): Differences in the assessment of knowledge between pretest and posttest control group

<table>
<thead>
<tr>
<th>Groups</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Paired t test (P value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (Pretest)</td>
<td>3</td>
<td>17</td>
<td>0</td>
<td>1.95 (0.06) NS</td>
</tr>
<tr>
<td></td>
<td>Mean±SD 0.42±0.26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (Posttest)</td>
<td>1</td>
<td>19</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean±SD 0.43±0.26</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NS: Non-significant, SD: standard deviation

Findings of above table shows the differences in the assessment of knowledge between pretest and posttest control group; it shows that there no significant difference (P >0.05) among pretest and posttest assessment in the control group. The assessment of knowledge is based on the statistical scoring system that indicated total score between (0-0.33) as poor knowledge; fair is between (0.34-0.66); while good knowledge is above (0.66).

Table (4): Total Assessment of knowledge prior the program

<table>
<thead>
<tr>
<th>Groups</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Independent t test (P value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study (Pretest)</td>
<td>3</td>
<td>17</td>
<td>0</td>
<td>0.09 (0.92) NS</td>
</tr>
<tr>
<td></td>
<td>Mean±SD 0.41±0.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (Pretest)</td>
<td>3</td>
<td>17</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean±SD 0.42±0.26</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (4) shows that there are no significant difference among both groups in pretest.
Table (5): Total Assessment of knowledge next the program

<table>
<thead>
<tr>
<th>Groups</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Independent t test (P value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study (Posttest)</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>12.27 (0.000) HS</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>0.0</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean±SD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.95±0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (Posttest)</td>
<td>1</td>
<td>19</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.0</td>
<td>95</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean±SD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.43±0.26</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

HS: High-significant

Table (5) display there is a strong significant difference among the nurses’ knowledge for study and control groups through posttest.

Table (6): Correlation between mean of scores of nurses’ knowledge (study group), No. of training course and their age and experience

<table>
<thead>
<tr>
<th>Demographic Data</th>
<th>Pearson’s Correlation Coefficient</th>
<th>Significance P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of training course</td>
<td>-0.107</td>
<td>&gt; 0.05 NS</td>
</tr>
<tr>
<td>Years of Experience in nursing</td>
<td>-0.248</td>
<td>&gt; 0.05 NS</td>
</tr>
<tr>
<td>Years of Experience in burns unit</td>
<td>-0.120</td>
<td>&gt; 0.05 NS</td>
</tr>
<tr>
<td>Age</td>
<td>-0.35</td>
<td>&gt; 0.05 NS</td>
</tr>
</tbody>
</table>

Table (6) shows correlation between mean of scores of nurses’ knowledge (study group), No. of training course and their age and experience; according to this table there is a no significant negative correlation (P>0.05) between overall knowledge, No. of training course and their age and experience.

Table (7): Association between nurses’ demographic data and their knowledge for study group

<table>
<thead>
<tr>
<th>Demographic Data</th>
<th>Chi Square</th>
<th>Significance P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>4.31</td>
<td>0.03</td>
</tr>
<tr>
<td>Residence</td>
<td>0.16</td>
<td>0.6</td>
</tr>
<tr>
<td>Marital Status</td>
<td>1.56</td>
<td>0.21</td>
</tr>
<tr>
<td>Educational Status</td>
<td>2.07</td>
<td>0.35</td>
</tr>
<tr>
<td>Economic Status</td>
<td>0.67</td>
<td>0.7</td>
</tr>
<tr>
<td>Participation in a training about burn care</td>
<td>1.9</td>
<td>0.16</td>
</tr>
<tr>
<td>Places of training course</td>
<td>0.25</td>
<td>0.54</td>
</tr>
</tbody>
</table>

Table (7) offers there is no significant association (P>0.05) among overall knowledge of the study group regarding burns and their demographic characteristics; except for gender that showed significant difference with males having better answers than woman according to table (8).

Table (8): Contingency table and odds ratio for the correlation between nurses’ knowledge (study group) and gender

<table>
<thead>
<tr>
<th>Nurses’ Subgroups</th>
<th>No.</th>
<th>Responses</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Incorrect</td>
<td>Correct</td>
</tr>
<tr>
<td>1. Male</td>
<td>11</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>2. Female</td>
<td>9</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>
Discussion

Concerning their age, the majority of study and control groups are at age groups (21-30) years. This result coincides with the result mentioned nearly three quarters of the nurses are in the age group 21-30 years old. This may be related to the willingness of young nurses to take part in more educational courses in order to obtain more expertise and practice, while most older nurses do not think they need more courses because they have achieved a degree of experience to serve as a mentor.

About the gender of the study subjects, the higher percentages of participant in both groups (55%) and (60%) are males for study and control groups respectively, which is in consistency with revealed in their study that more than half of the nurses were males. This is may be linked to the few numbers of female in the burn unit.

Relative to the residency, the present study demonstrates that the entire sample from urban. These results are consistent with those who stated in their study that (94.4%) of the sample are urban residents. This may be related with nurses who prefer to stay close to their workplaces especially when working in critical care units such as burn units.

Regarding the marital status, the current study shows that most of the nurses (65%) and (75%) in the study and control groups are married respectively. The results of this study are congruent with who stated in their study that the majority of nurses are married.

Concerning the economic status, the highest percentage of both groups is satisfied to some extent. This result may be related to their need for more expenses to bear the burden of life.

Regarding the level of education, the study shows that the majority of study and control groups were graduated from university and institute. These results are in agreement with who indicated that approximately three quarters of the nurses obtained a university education. Further, reported that more than half of the nurses graduated from medical institutes. This is may be associated that the burn center is considered one of the critical centers that require special care and a scientific nursing staff.

Concerning the years of experience in nursing, the result of current study revealed that the majority of nurses in study and control groups are between (1-9) years of experience in nursing. This result is compatible with where he showed that the percentage of nurses with 10 years of experience and less is (85.7%). It may be related that they want to benefit and increase their knowledge.

Regarding to the years of experience in the burn unit, the present study shows that both groups have between (1-4) years. This finding is harmonious with another study they indicated that more than half of the nurses had work experience less than 5 years. That can happen because the hospital policies from time to time use a special distribution program for staff to fill the vacant positions in the hospital with nurses from different place. Moving the nursing staff to another place of work will also impact their experience, which could be incomplete

About training sessions toward burn injury, the majority of the sample in both study and control groups 65% had one training sessions. These results are correspondent with They revealed that more than two thirds of the sample attended one or two seminars. Furthermore, the findings indicate that none of the nurses in both groups have training sessions outside Iraq, this refers to no chances offered to the participants in nursing field training out of Iraq because of the country’s unstable financial situation.

Nurses knowledge has been improved regarding nursing management for patients with burn injury in the study group after exposure to educational program. This is indicated by the significant difference between pre-test and post-test results, which is reinforced by a preceding study which indicated after execution of nursing guidelines programa significant statistical enhanced of nurses knowledge score stated that the program was effective and developed nurses’ knowledge.

The existing study exposes that there is no significant association between post-test and demographic data of study group in related to (age, residency, marital status, socio-economic status, years of experience, level of education, and training sessions). Except for gender, the current study found that there is a relationship between gender and knowledge, where it was shown that men have better answers than women, this result contrast with (Sudani & Ali, 2017) found no relationship between gender and knowledge. This may be due to the freedom and flexibility given to men in our society where he has more freedom by attending seminars or opening nursing
clinics and gaining knowledge. With regard to other results, there are many studies that match our results and among them the research conducted by (Kadhim et al., 2019; El-Sayed et al., 2015; Lam and Tuan, 2018).

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Adult Nursing and all experiments were carried out in accordance with approved guidelines.

**References**

Study the Role Serum Omentin-1 in Occurrence and Development of Diabetic Retinopathy

Hussein Inam Mustafa¹, Sami A. Zbaar², Marwan Salah Salman³

¹M.Sc. Student, Medical Biochemistry, Kirkuk Health Directorate, ²Ph.D. Medical Biochemistry, College of Medicine, Tikrit University, ³Ph.D. Ophthalmology, College of Medicine, Tikrit University

Abstract

Diabetic retinopathy (DR) is a retinal disease which is one of the most severe microvascular complications occurring due to diabetes mellitus and is a major cause of blindness. The aim of this work was to study the serum level of omentin-1 and its relation to diabetic retinopathy in type 2 diabetes mellitus. The study included 60 diabetic patients (30 patients T2DM complicated with DR and 30 patients T2DM not complicated with DR). The study also included 30 healthy control individuals defended as subjects who apparently haven’t any chronic diseases. Thorough history taking and physical examination with calculation of body mass index (BMI), investigations were done including HbA1c, C-reactive protein (CRP) and serum omentin-1. Fundus examination was carried out by an expert ophthalmologist. The study showed that serum omentin-1 was reduced significantly (P<0.001) in DM patients (15.29±3.69 ng/ml) as compared with the control group (24.95±4.22 ng/ml), Table 1. The study also showed that serum omentin-1 was reduced significantly (P<0.001) in DR patients (12.39±2.21 ng/ml), comparing with DM patients without retinopathy (17.52±2.28 ng/ml). The study revealed that the highest mean of HbA1c was found in DM patients (8.39±1.62 %) as compared by the control group (4.91±0.43 %) (P<0.001), Table 3. The study also found that HbA1c was elevated significantly (P<0.001) in DR patients (9.38±1.65 %) comparing with DM patients without retinopathy (7.66±0.79 %) (P<0.001). The study showed that, the highest mean of serum CRP was recorded in DM patients (7.89±1.76 mg/dl), as compared with the control group (4.51±0.72 mg/dl) (P<0.001), Table 5. The study also found that CRP was elevated significantly (P<0.001) in DR patients (9.37±1.11 mg/dl) as compared with diabetic without retinopathy patients (6.41±0.73 mg/dl), The study showed that 60% DR patients suffered from T2D for more than 9 years and 40% suffered DM for 7-9 years while all diabetic patients without retinopathy were suffered from T2D for ≤ 9 years with a significant relation between Dr and the duration of diabetes (P<0.001). The study showed negative correlation of serum omentin-1 concentrations with duration of diabetes, BMI, HbA1c and CRP. From this study we can conclude that serum omentin-1 levels are correlated with the presence and severity of DR.

Keywords: Omentin-1; Type 2 diabetes mellitus; Diabetic retinopathy; HbA1c.

Introduction

Diabetic retinopathy (DR) is a chronic ocular complication of diabetes that is seen to some degree in approximately one-third of diabetic patients(1). Approximately one-third of patients with diabetic retinopathy have vision-threatening retinopathy (i.e., diabetic macular edema, severe non-proliferative diabetic retinopathy, or proliferative diabetic retinopathy)(2). The rate of progression varies depending on the duration of the disease, glycemic control, hypertension, and genetics. Proliferative diabetic retinopathy (PDR) is diagnosed in the presence of retinal or disc neovascularization, a consequence of retinal ischemia(3). Overall, the rate of progression to PDR and severe vision loss has decreased in the last two decades, most likely due to improvement in diabetic care(4). The risk of developing advanced PDR correlates directly with markers of glycemic exposure (such as HbA1c, duration of diabetes), hypertension, cardiovascular disease events, and albuminuria and inversely with age at diabetes diagnosis and, surprisingly, smoking(5). Omentin-1 is a novel peptide adipocytokine which was first acknowledged from cDNA library
consisting of human omental white adipose tissue (WAT)\(^6\). It is an adipocytokine which is released from omental and epicardial adipose tissue; and also from blood vessels, intestinal and respiratory airway goblet cells, mesothelial cells and ovary. The major effects of this secretory adipokine are the positive influences on insulin sensitivity and reduction of inflammation\(^7\). In human adipocytes, it has been found to play a role in promoting insulin-induced glucose uptake via protein kinase B (PKB) phosphorylation \(^8\). It mainly acts by suppressing ERK/NF-KB pathway or p38/JNK pathway mediated inflammation. In patients with obesity, insulin resistance and DM, the circulating concentration of omentin-1 is found to be reduced. As it is a protective molecule against insulin resistance and inflammation, it is worthwhile to study the role of omentin-1 in the pathogenesis of diabetic retinopathy\(^9,10\). In this study, we aimed to assess and compare the level of omentin-1 in the serum of patients with type 2 diabetes mellitus with and without diabetic retinopathy.

**Materials and Method**

This case-control study was carried out in Kirkuk city from the period started from 1\(^\text{st}\) of December 2019 to the end of February 2020. The study included 60 diabetic patients (30 patients T2DM complicated with DR and 30 patients T2DM not complicated with DR), their age between 45–64 years, these patients who attended Kirkuk General Hospital. Diabetic retinopathy was defined according to Fundus examination which carried out to all participants by an expert ophthalmologist. The study also included 30 healthy control individuals defined as subjects who apparently haven’t any chronic diseases. All participants were subjected to thorough history with special emphasis on age, sex and duration of DM. Complete physical examination performed to all subject with estimation of weight and height to calculate body mass index (BMI). Investigations included HbA1c by immunofluorescence technique (i-chroma II), C-reactive protein by immunofluorescence technique (i-chroma II), urine albumin creatinine ratio by testing micro-albumin and creatinine in urine (manual biochemical kits), and serum omentin-1 level was measured using an enzyme-linked immune sorbent assay.

**Exclusion Criteria:** Type 1 diabetes, Diabetic nephropathy (UACR more than 30 mg/g), Diabetic neuropathy, Chronic inflammatory diseases (e.g. rheumatoid arthritis), collagen disease, and chronic infections, History of malignancies, Heart diseases.

**Statistical Analysis:** Computerized statistically analysis was performed using Minitab version 23 statistic program. Comparison was carried out using Chi-square \((X^2)\), T-Test probability and ANOVA (analysis of variance). The \(P\) value\(>0.05\) was considered statistically significant, while for those which its \(P\) value was greater than 0.05 considered non-significant statistically.

**Result**

The study showed that serum omentin-1 was reduced significantly \((P<0.001)\) in DM patients \((15.29\pm3.69 \text{ ng/ml})\) as compared with the control group \((24.95\pm4.22 \text{ ng/ml})\), Table 1. The study also showed that serum omentin-1 was reduced significantly \((P<0.001)\) in DR patients \((12.39\pm2.21 \text{ ng/ml})\), comparing with DM patients without retinopathy \((17.52\pm2.28 \text{ ng/ml})\), Table 2.

<table>
<thead>
<tr>
<th>Table 1: Levels of serum omentin-1 in the studied groups</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Omentin-1 (ng/ml)</strong></td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>SD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2: Levels of serum omentin-1 in the DM patients (with and without retinopathy)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Omentin-1 (ng/ml)</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Mean±SD</td>
</tr>
<tr>
<td>Minimum</td>
</tr>
<tr>
<td>Maximum</td>
</tr>
</tbody>
</table>
The study revealed that the highest mean of HbA1c was found in DM patients (8.39±1.62 %) as compared by the control group (4.91±0.43 %) (P<0.001), Table 3. The study also found that HbA1c was elevated significantly (P<0.001) in DR patients (9.38±1.65 %) comparing with DM patients without retinopathy (7.66±0.79 %) (P<0.001), Table 4.

**Table 3: Relation of HbA1c with diabetic retinopathy**

<table>
<thead>
<tr>
<th>HbA1c (%)</th>
<th>Type 2 diabetic patients (n:60)</th>
<th>Control group (n:30)</th>
<th>T. Test</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean±SD</td>
<td>8.39±1.62</td>
<td>4.91</td>
<td>15.55</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Minimum</td>
<td>1.62</td>
<td>0.43</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 4: Mean of HbA1c in DM patients (with and without retinopathy)**

<table>
<thead>
<tr>
<th>HbA1c (%)</th>
<th>Type 2 diabetic patients</th>
<th>T. Test</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Retinopathy (n:30)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean±SD</td>
<td>9.38±1.65</td>
<td>13.62</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Minimum</td>
<td>6.9</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>11.8</td>
<td>8.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Without Retinopathy (n:30)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean±SD</td>
<td>7.66±0.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>6.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>8.8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The study showed that, the highest mean of serum CRP was recorded in DM patients (7.89±1.76 mg/dl), as compared with the control group (4.51±0.72 mg/dl) (P<0.001), Table 5. The study also found that CRP was elevated significantly (P<0.001) in DR patients (9.37±1.11 mg/dl) as compared with diabetic without retinopathy patients (6.41±0.73 mg/dl), Table 6.

**Table 5: Levels of C-reactive protein in the studied groups**

<table>
<thead>
<tr>
<th>C-Reactive protein (mg/dl)</th>
<th>Type 2 diabetic patients (n:60)</th>
<th>Control group (n:30)</th>
<th>T. Test</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>7.89</td>
<td>4.51</td>
<td>12.43</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>SD</td>
<td>1.76</td>
<td>0.72</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 6: Levels of C-reactive protein in DM patients (with and without retinopathy)**

<table>
<thead>
<tr>
<th>C-Reactive protein (mg/dl)</th>
<th>Type 2 diabetic patients</th>
<th>T. Test</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Retinopathy (n:30)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean±SD</td>
<td>9.37±1.11</td>
<td>12.15</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Minimum</td>
<td>7.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>11.4</td>
<td>7.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Without retinopathy (n:30)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean±SD</td>
<td>6.41±0.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>5.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>7.8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7 shows that 60% DR patients suffered from T2D for more than 9 years and 40% suffered DM for 7-9 years while all diabetic patients without retinopathy were suffered from T2D for ≤ 9 years with a significant relation between Dr and the duration of diabetes (P<0.001).
Table 7: Relation of diabetic retinopathy with the duration of diabetes

<table>
<thead>
<tr>
<th>Duration of diabetes (years)</th>
<th>Type 2 diabetic patients</th>
<th>Retinopathy</th>
<th>%</th>
<th>Without retinopathy</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>3-6</td>
<td>0</td>
<td>16</td>
<td>53.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-9</td>
<td>12</td>
<td>14</td>
<td>46.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;9</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>30</td>
<td>100</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

P. value: 0.0001 X^2: 34.5 (X^2: Chi square)

**Discussion**

The study revealed that the highest mean of HbA1c was found in DM patients (8.39±1.62 %) as compared by the control group (4.91±0.43 %) (P<0.001), Table 1. The study also found that HbA1c was elevated significantly (P<0.001) in DR patients (9.38±1.65 %) comparing with DM patients without retinopathy (7.66±0.79 %) (P<0.001), Table 2. In agreement, Al-Ramadhan(11) study showed that, HbA1c was elevated significantly in DR group followed by DM patients and indicating that poor glycemic control is a strong predictor for the development of DR. The elevated levels of HbA1c in DR patients may be due to their induction of retinal inflammation and vascular leakage due to their effect on blood vessels which may lead to retinal cell death(12).

The study showed that the highest mean of serum CRP was recorded in DM patients (7.89±1.76 mg/dl), as compared with the control group (4.51±0.72 mg/dl) (P<0.001), Table 3. The study also found that CRP was elevated significantly (P<0.001) in DR patients (9.37±1.11 mg/dl) as compared with diabetic without retinopathy patients (6.41±0.73 mg/dl), Table 4. Our findings were also in agreement with the study done by Du et al (13) and Yasir et al (14), they found the hsCRP level was elevated more frequently in DR patients followed by NDR patients as compared with the control group. Moreover, AL-Harbi (15) data indicated that, serum CRP level had significant increase in T2DM group compared with control group.

Based on the previous investigation of CRP, it has been hypothesized that elevated CRP levels may be beneficial in the pre-proliferative stages of DR by relieving ischemia, up-regulating the expression of vascular endothelial growth factor A and thus increasing retinal perfusion(16). Collectively, the role of CRP in the inflammatory process is rather complicated as this protein may initiate and/or modulate multiple responses of the host and in this current study it is suggested that CRP may play a protective role in the DR pathogenesis(17).

Table 5 shows that 60% DR patients suffered from T2D for more than 9 years and 40% suffered DM for 7-9 years while all diabetic patients without retinopathy were suffered from T2D for ≤ 9 years with a significant relation between DR and the duration of diabetes (P<0.001). Cheng et al (18) revealed that, the presence of DR is strongly related to the duration of diabetes, with an approximate three-fold increase in vision-threatening DR in those who have had DM for 10 years or more. Menzel et al (19) also studied association of various risk factors with diabetic retinopathy and found significant relation of HbA1c with DR (P<0.001). Zhou et al (20) showed in similar study a significant relation of diabetic retinopathy with duration of diabetes (P<0.03). There is a strong positive relationship between the duration of diabetes and prevalence and progression of DR(21). The prevalence of any DR increased from 21.1% in subjects with diabetes of 10 years duration to 54.2% with duration between 10 and 20 years to 76.3% with ≥20 years disease duration in the META-EYE study (22).

The study showed that serum omentin-1 was reduced significantly (P<0.001) in DM patients (15.29±3.69 ng/ml) as compared with the control group (24.95±4.22 ng/ml), Table 6. The study also showed that serum omentin-1 was reduced significantly (P<0.001) in DR patients (12.39±2.21 ng/ml), comparing with DM patients without retinopathy (17.52±2.28 ng/ml), Table 7.
Korany et al. (23) also found that, serum omentin-1 level was significantly lower in diabetic patients compared with the control, and in DR compared with diabetics without DR. Omae et al. (24) also found that, serum omintin-1 was reduced significantly (P<0.001) in DR patients, comparing with DM patients without retinopathy. Additionally, in recent meta-analysis study showed that serum level of omentin was significantly lower in T2DM compared to healthy controls (25).

The possible explanation for this phenomenon is that, as omentin-1 could increases insulin sensitivity, its decrease may be the cause of impaired glucose homeostasis in prediabetic patients (1,3).

Omentin-1 is important for glucose metabolism-invito, omentin-1 increases insulin signal transduction by activating the protein kinase B and enhances insulin-mediated glucose transport in adipocytes. A clinical study of patients suffering from diabetes mellitus, reported that serum and vitreous omentin levels were related to the severity of DR, and experimental investigations have shown that omentin has a potent vasodilatory effect in isolated vessels mediated by endothelium derived nitric oxide, a strong vasodilator of the retinal arterioles (26).

The study showed negative correlation between omentin-1 and duration of DM, Figure 1.

Korany et al. (23) also found that, serum omentin-1 level was negatively correlated with DM duration. Interestingly, El-Mesallamy et al. (27) also found that, omentin-1 was negatively correlated with duration of DM.

The study showed negative correlation between omentin-1 and BMI of DM patients, Figure 2.

In agreement with this finding, Korany et al. (23) found that, serum omentin-1 level had a negative significant correlation with BMI in DM patients. Some studies have also shown that omentin-1 serum levels were generally lower in obese groups with or without type 2 DM (28). In a study performed by de souza Batista et al. (29) plasma levels of omentin were measured in lean, overweight, and obese, otherwise healthy subjects. The authors found that plasma omentin levels were highest among the lean subjects and these levels were inversely correlated with BMI. Our results were agreed with the findings reported by other studies that demonstrated significant negative correlation between plasma omentin-1 concentrations and patients BMI (30-31).

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Kirkuk Health Directorate and all experiments were carried out in accordance with approved guidelines.

**References**


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Estimation Level of Leptin and Resistin in Sera Patients with Type Two Diabetes among Iraqi Peoples

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Abstract

Leptin is a protein hormone containing 167 amino acids, firstly discovered in 1994 by Jeffrey M. Friedman, It is secreted by adipocytes and has been found to regulate food intakes through central neuroendocrine mechanisms. Resistin has been found to be generated and released via adipose tissue to serve endocrine functions which are likely to be associated with insulin resistance.

Aim: The aim of this study determination of leptin and resistin hormone level in serum of male and female with type 2 diabetic patients and healthy control in Iraq.

Subject and Method: This respective study carried out at three main medical facilities in Baghdad; National Center For Teaching Laboratories, Poisoning Consultation Center/Specialized Surgeries Hospital and the National Blood Transfusion center in Medical City,Iraq during the period from November 2019 to February 2020. It was included 100 participants; divided into 2 groups(50 patient with type 2 diabetes and 50 healthy control).

Results: The result of serum leptin showed that there was highly significant difference when comparing the mean of total serum leptin of patient group with that of the control group. While the mean of total circulating resistin in T2DM patient and healthy with no significant difference between the two groups.

Conclusion: Increased serum leptin level in type 2 diabetes patient than healthy control and no significant difference in serum resistin level when compared between diabetics and control

Keywords: Type Two diabetes, Leptin, Resistin.

Introduction

Diabetes is a complex, chronic disorder requiring continuous medical care. It is a serious, long-lasting or chronic disorder that occurs when there are raised levels of glucose in a person’s blood because their body cannot produce any or enough insulin, or cannot effectively use the insulin it produces. Insulin is an essential hormone produced by the beta cells in the islets of Langerhans in the pancreas. It allows glucose from the bloodstream to enter the body’s cells where that glucose is converted into energy. The main function of this hormone is to lower the level of glucose in the blood by promoting the uptake of glucose by the adipose tissue and skeletal muscle, known as glycogenesis. Ultimately to the homoeostasis of glucose which leads to complications like retinopathy, atherosclerosis, cardiovascular diseases, nephropathy and peripheral neuropathy. Type II diabetes usually affects people aged over 40 years. This metabolic disorder is characterized by target tissue resistance to insulin, It is epidemic in industrialized societies, and is strongly associated with obesity, Thus obesity is generally considered to be a strong risk factor for the later development of T2DM, and at times, they frequently occur together. Statistics show that 60%–90% of all patients with T2DM are or have been obese. Leptin originates from of the Greek root leptos, meaning...
Leptin is predominantly derived from white adipose tissue and released as a 16 kilo Dalton [kDa] Non-glycosylated protein with LEP encoding gene, also referred LEP gene in human. Leptin binds to its receptor (LEPR) expressed in the central nervous system and peripheral tissues and performs its biological acts. Generally, hyperleptinemia has been linked with T2DM, insulin resistance and complications of the vascular diabetes. Antidiabetic medicine can reduce leptin levels including sitagliptin, metformin, pioglitazone and liraglutide. Resistin is a putative adipocyte-derived signaling of polypeptides hormone(ADSF) the Molecular weightis 12.5kDa, with a length of 108 amino acids That is generated and released into the bloodstream from white adipose tissue, primarily by macrophages in human Resistin functions as the pathogenic factor which results in insulin resistance by antagonizing the action of insulin, thus raising gluconeogenesis and impairing the absorption of hepatic glucose.

**Subjects and Method**

This respective study was carried out at three main medical facilities in Baghdad; National Center For Teaching Laboratories, Poisoning Consultation Center/ Specialized Surgeries Hospital and the National Blood Transfusion center in Medical City, Iraq during the period from November 2019 to February 2020. It included 100 participants; divided into 2 groups(50 patient with type 2 diabetes and 50 healthy control) and 2 subgroups. The type 2 diabetic patient group were subdivided into(25 male, 25 female) with age (30-65) and healthy control group subgroup (25 male,25 female) with age (29-65). All the information about each individual in the above groups including data about their age, height, weight, cigarette smoking, family history, duration of disease, habit and medication were collected by filling a questionnaire case sheet for each patient. Statistical Analysis: Data was conducted by using SPSS program (Statistical Package For Social Science) version 24.

**Method**

Leptin and resistin was estimated by using ELISA (Enzyme linked immunosorbent assay) Kit from SHANGHAI YEHUA Biological Technology, HbA1c was estimated for each type 2 diabetic patient(T2DM) and healthy control by using Arkray Adam HA-8160 HbA1c is a fully automated analyser is used for estimation that uses high performance liquid chromatography (HPLC) cation exchange method.

**Results**

The study included 50 Males and 50 females were included in this study. The age range for patients and control groups was (30-65) and (29-65) years respectively as show in table(1-1). The Mean± Std. of glycatedhemoglobin (HbA1c %) for patients and control . The mean for patient was highly significantly higher than that of the control group (7.83±1.36% and 5.47±0.234 %respectively) as shown in table (1-2).

<table>
<thead>
<tr>
<th>Study Groups</th>
<th>Mean± Std.</th>
<th>t-test</th>
<th>P-Value</th>
<th>C.S</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1C%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>7.83±1.36</td>
<td>12.092</td>
<td>.000</td>
<td>P&lt;0.01 (HS)</td>
</tr>
<tr>
<td>Control</td>
<td>5.47±0.234</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The result of serum leptin level summarized in the table (1-2) and figure (1-1) showed that there was highly significant difference when comparing the mean of total serum leptin of patient group (44.48±12.41ng/ml) with that of the control group(38.75±7.61ng/ml). While there was no significant difference between males and females of the control group in mean serum leptin level (36.982±6.705 and 40.522±8.169 respectively),
but there was significant difference among male and female patients (P<0.05). And the results in table (1-3) and figure (1-2) showed the mean of total circulating resistin in T2DM patient and healthy control (10.18±3.87 and 9.71±2.02 ng/ml respectively) with no significant difference between the two groups. Furthermore, there was no significant difference between male and female patients (9.208±3.632 and 11.1520±3.933 ng/ml respectively). Similarly, no significant difference in circulating resistin between male and female control (P>0.05).\textsuperscript{13}

### Table (3): Comparison in Leptin level among study groups and Gender

<table>
<thead>
<tr>
<th>Leptin (ng/ml)</th>
<th>Total (Mean± Std.) ng/ml</th>
<th>Male (Mean± Std.) ng/ml</th>
<th>Female (Mean± Std.) ng/ml</th>
<th>t-test</th>
<th>P-Value</th>
<th>C.S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>38.75±7.61</td>
<td>36.982±6.705</td>
<td>40.522±8.169</td>
<td>1.975</td>
<td>.100</td>
<td>P&gt;0.05 (NS)</td>
</tr>
<tr>
<td>Study</td>
<td>44.48±12.41</td>
<td>40.720±12.765</td>
<td>48.237±11.039</td>
<td>2.227</td>
<td>.031</td>
<td>P&lt;0.05 (S)</td>
</tr>
<tr>
<td>t-test</td>
<td>2.782</td>
<td>1.296</td>
<td>2.809</td>
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<td></td>
</tr>
<tr>
<td>P-Value</td>
<td>.006</td>
<td>.201</td>
<td>.007</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C.S</td>
<td>P&lt;0.01 (HS)</td>
<td>P&gt;0.05 (NS)</td>
<td>P&lt;0.01 (HS)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Fig. (1-1): Mean Value of Leptin among study groups

### Table (4): Comparison between studied Groups and Gender according to serum resistin

<table>
<thead>
<tr>
<th></th>
<th>Total (Mean± Std.) ng/ml</th>
<th>Male (Mean± Std.) ng/ml</th>
<th>Female (Mean± Std.) ng/ml</th>
<th>t-test</th>
<th>P-Value</th>
<th>C.S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>9.71±2.02</td>
<td>9.924±1.805</td>
<td>9.504±2.236</td>
<td>0.731</td>
<td>.468</td>
<td>P&gt;0.05 (NS)</td>
</tr>
<tr>
<td>Patient</td>
<td>10.18±3.87</td>
<td>9.208±3.632</td>
<td>11.1520±3.933</td>
<td>1.816</td>
<td>.076</td>
<td>P&gt;0.05 (NS)</td>
</tr>
<tr>
<td>t-test</td>
<td>0.768</td>
<td>0.883</td>
<td>1.821</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Value</td>
<td>.446</td>
<td>.203</td>
<td>.075</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C.S</td>
<td>P&gt;0.05 (NS)</td>
<td>P&gt;0.05 (NS)</td>
<td>P&gt;0.05 (NS)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Discussion

HbA1c analysis in the blood provides proof of the average blood glucose levels through the previous 2 to 3 months, which is estimated half-life of red blood cells (RBCs). HbA1c provides a most reliable measure of chronic glycemia and is well associated with the risk of long term complications of diabetes, so it is widely considered the test of choice for chronic diabetes management and monitoring\textsuperscript{14}.

The association between leptin and diabetes mellitus in humans was examined in few studies. But Leptin is an essential hormone derived from adipose tissue which has been shown to be involved in patho-physiological processes relating to diabetes. This study is consistent with Kumar, et al.,\textsuperscript{15} as the study found that the level of leptin is higher in diabetic patients compared to healthy subjects\textsuperscript{15}. The human laboratory studies indicate levels of leptin are closely linked to body fatness. Serum leptin is reportedly a good biomarker of obesity. Thus, body fat can mediate an association between serum leptin and diabetes mellitus\textsuperscript{16}.

Another study was agreement with these finding Gupta & Mukherjee., who was reported that the level of serum leptin were significantly increase in diabetic patient when compared to healthy control\textsuperscript{17}. In addition to that Osegbe, et al., found differences in the concentration of leptin levels, female with T2DM has higher serum leptin than healthy female and this compatible with our study\textsuperscript{18}. Females with diabetes have a higher concentration of leptin compared to males, and this is consistent with Diwan, et al., study in India reported that the serum leptin levels in females were higher than in males. In addition, the serum leptin levels in diabetics were significantly higher than in nondiabetics\textsuperscript{19}. On the other hand, we found that there was no difference in the level of leptin in males suffering from diabetes compared to healthy controls, and These result was compatible with Zamil.,2019 study in Iraq did not find any significant association in leptin concentration between male with T2DM and healthy control\textsuperscript{20}.

In present study there was no signficant difference between type 2 diabetic patient and control . This study is in agreement with Zamil .2019 a study in Baghdad that
concluded that there is no difference in the concentration of resistin in patients with type 2 diabetes and among healthy subjects. The main biological effects of resistin are associated with increased blood glucose levels and obesity in some animal models, explained in part as a result of increased production of hepatic glucose. Resistin is an adipokine that acts as a biomarker for inflammation and a mediator of insulin resistance linked to obesity. Resistin in humans reduce insulin-stimulated glucose in the isolated adipocytes. The fundamental mechanisms these effects remain unclear while data aim to suppress resistin AMPK activity, primarily in the liver, due to cytokine stimulation-3 suppressor activation. These results are also in agreement with Pfützner, et al., No significant association was found between serum resistin levels and obesity and insulin resistant clinical measures. Bu et al. also found resistin levels in both the T2DM and the normoglycemic group had no relationship to insulin resistance.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the National Blood Transfusion Center and all experiments were carried out in accordance with approved guidelines.

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Placental Vasculogenesis and Angiogenesis Related to GDM and the Possible Affect on the Placenta and the Fetus Outcome

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Abstract

Placentas from gestational diabetes mellitus (GDM) are Patterns of fetoplacental angiogenesis of GDM often hypervascularized. Placenta is a mirror that reflects the well-being of the fetus and continuously undergoes a change in weight, structure, shape and function in order to support the well-being of the fetus.

Aim of Study: In this work we attempted to identify villous vascular and morphological changes in a group of term placentae from mothers with GDM complicating pregnancy.

Objective: To analysis on the possible gross morphological changes and Patterns of fetoplacental angiogenesis of GDM.

Materials and Method: The study was observational, analytical and cross sectional. The patients under this study were selected from the Obstetric of AL-Emam AL-sadiq in the Babylon province. A total of eighty samples were collected from women completed weeks of gestation. Among them, 40 samples were from mothers having GDM, 40 belonged to normal pregnancy (control group). The placentas were examined to measure their weight, diameter, thickness, cotyledons number, Insertion of umbilical cord, Vascular pattern and Fasting blood glucose were determined by enzymatic method using Envoy® 500 reagents .Beta chorionic gonadotrophin, progesterone and estradiol were determined using chemilumiscence immunoassay technique on MAGLUMI 600 analyzer.

Results: In this study, the GDM group showed significantly higher values for the variables of the weight, thickness,diameter, number of cotyledons, Patterns of fetoplacental angiogenesis of GDM and placentas hypervascularized as compared to normal group. Consequences of GDM include increased risk of macrosomia and birth complications in the infant. Fasting plasma glucose FBG, β-HCG, P4, E2 were increased in the gestational diabetic women.

Conclusion: From the findings of this study, placental variations in diabetic and normal mothers during pregnancy. The variations in placental weight, thickness, diameter and fetoplacental angiogenesis found in gestational diabetic mother may be a long term compensatory mechanism, aiming to secure a sufficient nutrient supply to support the growth of the foetus. So, postnatal examination of the placenta can yield information that may be important for immediate and late management of the mother and neonate. Fasting plasma glucose FBG, β-HCG, P4, E2 were increased in GDM group was aimed at assessing placental peptides and maternal factors as potential predictors of the development of gestational diabetes among pregnant women. GDM appears to effect the microvascular remodeling at angiogenesis. So gestational diabetes mellitus (GDM) need to be identified early in pregnancy and managed to maintain a normal vasculature and prevent neonatal mortality and morbidity if rapid intervention is completed.

Keywords: Placenta, GDM, Gross morphology, vasculogenesis, angiogenesis.

Introduction

The placenta is a transient organ that forms during pregnancy to support the growth and development of the fetus. During placental development, trophoblast cells differentiate through two major pathways. In the villous pathway, cytotrophoblast cells fuse to form
multinucleated syncytiotrophoblast. In the extravillous pathway, cytotrophoblast cells acquire an invasive phenotype and differentiate into either (first) interstitial extravilloustrophoblasts, which invade the decidua and a portion of the myometrium, or (second) endovascular extravilloustrophoblasts, which remodel the maternal vasculature. These differentiation controlled by the interplay of oxygen tension, transcription factors, hormones, growth factors, and other signaling molecules. Abnormal placental development, the limited invasion of trophoblast cells into the uterus and the following failure of the remodeling of maternal spiral arteries.\(^1\)

The vascularity of placental tissue is dependent on various factors of which fetomaternal hypoxia plays a major role. Hypoxia can be of different types and each type influences the vascularity of the terminal villi. Chorangiosis was the most frequently identified lesion in the GDM group while normal group had normal villous vasculature. Maternal diseases have a major role in disrupting the placental vasculogenesis and angiogenesis by making a hypoxic that may distress the fetus harmfully. The trophoblasts is epithelial cells have functioning as a precursor for the syncytiotrophoblast and extravilloustrophoblasts (EVT). cytotrophoblasts fuse and undergo biochemical differentiation, giving rise to the multinucleated syncytiotrophoblast. Cytotrophoblasts may also acquire invasive properties, forming the EVT. These trophoblasts are able to invade and remodel maternal tissues (interstitial EVT) and uterine spiral artery (endovascular EVT), leading to the widening of artery lumen, reducing the resistance against blood flow that irrigates the fetus. EVT may also invade and remodel uterine glands (endoglandular EVT), which is important to provide nutrition to the embryo. Trophoblast interact with each other and with decidual cells, Hofbäüer cells, endothelial cells, vascular smooth muscle cells, providing a sole microenvironment that is vital for pregnancy outcome and fetal development.\(^2\)

Fetal growth requires remodelling of maternal spiral arteries to provide an adequate maternal blood supply to the placenta. This arterial transformation is achieved by placental trophoblast cells, which invade into the uterine wall. Fetal growth restriction is associated with reduced remodelling of maternal spiral arteries by trophoblast cells. In normal pregnancy, extravilloustrophoblast cells migrate as far as the myometrium and also infiltrate into the arterial media and endothelium of maternal spiral arteries. This results in dilatation and increased flow of maternal blood at low pressure into the intervillous space. In pregnancies affected by gestational complication, the depth of trophoblast invasion is reduced with less spiral artery remodelling. Blood flows at higher pressure and is more pulsatile, resulting in placental stress, reduced placental development and poor fetal growth. Under-invasion is associated with fetal growth restriction; but if invasion is excessive large babies can result. A growing body of evidence is controlled by interactions between killer-cell immunoglobulin-like receptors expressed on maternal uterine natural killer cells (uNK).\(^3\)

Fetal growth in utero depends on the development of a good maternal blood supply to the placenta that requires modification of the uterine spiral arteries. Trophoblast cells from the placenta invade deeply into the stroma to effect arterial conversion. The extravilloustrophoblast cells (EVT) encircle the arteries, and then cause direct destruction of the smooth muscle of the arterial wall with complete loss of vasoconstriction. Trophoblast cells only move down the inside of the arteries to replace the endothelium and functionally modify the media.\(^4\)

The angiogenic process is divided broadly into three major steps including the initiation of the angiogenic response, endothelial cell (EC) migration, proliferation and tube formation, and finally the maturation of the neovasculature. Angiogenesis is a complex, highly regulated process, involving the sprouting, splitting, and remodeling of the existing vessels.\(^5\)

### Material and Method

**Inclusion Criteria**

Pregnancy women with gestational diabetes mellitus.

**Exclusion Criteria:** Pregnant women with a complication, such as gestational hypertension and pregestational DM (Preeexisting type I and Type II diabetes mellitus), had a twin pregnancy, and hypertension or other chronic diseases were excluded.

A cross-sectional case-control study from January to March 2019. A total of 80 pregnant women 40 fore each group. The study procedure was approved by the ethics committee of the First Affiliated Hospital Department of AL-Emam AL-sadiq in the Babylon province. Informed agreement was obtained from each participant. Placentas and umbilical cords were collected after delivery from full-term within 36th to 40th week of gestation, were included in this study of normal and gestational diabetic groups. Patients and normal pregnant women, who were attended a pretested guided questionnaire.
The participant females were asked to undergo for Oral Glucose Tolerance Test (OGTT). The control women were within the accepted normal ranges of blood glucose level from 90 to 115 mg/dL throughout gestation while the GDM women initially showed levels ranging from 120 to 160 mg/dL. 6

**Macroscopic Examinations:** Morphological variables of each placenta groups were studied: Immediately after the delivery, within 20 minutes after delivery placentas and umbilical cord were collected after delivery from 40 full-term normal or 40 full-term gestational diabetic. The placental membranes were clipped and blood coagulants were removed. The placental weight, diameter and thickness were recorded. Diameter of the placenta. The membranes were trimmed from their edges. Blood was removed gently from both surfaces with cotton wool and the umbilical cord was cut about 2 cm proximal to its insertion. Then the maximum diameter of each placenta was measured with a metallic scale graduated in centimeters, the second maximum diameter was recorded. Then the mean of these two measurements was considered as the diameter of each placenta. Placental thickness measured by piercing a metallic scale through central part including the whole thickness of the placenta were taken from the center of the placenta beside the site of attachment of the umbilical cord. Then separation of the cotyledons to make them prominent in the maternal surface. Counting was started from left side of one end and going through rightward. In this way, counting was continued in spiral manner.

For histological studies, full depth tissue samples. The tissue was cut into ~0.5 cm3 pieces from placenta on the central and marginal areas. Normal saline was used to wash the pieces before they were dissected into small sections, were placed in 10% formal saline for 24-48 hours and were subsequently embedded in paraffin. The 4-µm thick sections were stained with Haematoxylin & Eosin. Numbers and diameter of blood vessels of TV were measured using stage, ocular and reticule micrometers.

Fasting blood glucose were determined by enzymatic method using Envoy® 500 reagents (Vital Diagnostics, USA). Beta chorionic gonadotrophin, progesterone and estradiol were determined using chemilumiscence immunoassay technique on MAGLUMI 600 analyzer. The sandwich chemilumiscence immunoassay technique was used, adhering to the manufacturers’ protocol. The statistical significance of difference between the two groups was evaluated using the Student’s paired t-test.

**Result**

The results in this work, table(I) shows that the weight of placenta is an significant and functionally important parameter as it is related to foetal metabolism and villous area. So placental weight, diameter, central thickness and number of cotyledons per placenta 658±36.5, 22.7±3.44, 167.1±12.22 and (20.55±5.06) respectively Increase in diabetic mothers comparison with the normal placenta. In recent study variation was found in umbilical cord insertion between the two groups. Site of umbilical cord insertion was eccentric (37 vs 25), centric (3 vs 10), marginal (0 vs 3) velamentous (0 vs 2) respectively. Vascular magistral pattern was one case in the GDM group while it was more frequently observed in the normal group. mean birth weight of babies were 3659±123. Ratio of newborn weight to placental weight was 5.8±0.5 reduced in GDM compared to controls. The result of recent study is sex male/female was 24/16 vs 19/21 . In this study the preterm birth only three was in GDM group. Apgar score the mean was 8.9±0.5 vs7.3±0.2, the mean of Apgar score was less than normal group. (Table 2) was revealed the number of BVs were increased in the GDM group compared to normal was 10.50±3.33 vs 19.87±4.62, while its mean diameter of blood vessels was 0.04±0.03 vs 0.03±0.02 found to be significantly decreased. (Table 3) Fasting plasma glucose FBG (mmol/l) 6.30±1.02, β-HCG Iu 5001.0±0.01, P4 (ng/ml) 72.74±10.53, E2 (pmol/L 4501.0±1334.33 were increased in the gestational diabetic women. Histological finding Fig. 1(left): The GDM placenta showed increased syncytial knots, thickening of vasculosyncytial membrane, massive fibrinoid necrosis and chorangiosis as fig(1) and Fig.2(right): placental villi showing the Hofbauer cells within the edema and fibrin deposition.
Fig. 1 (Left): The GDM placenta showed chorangiosis with Fetal vessel thrombosis, increased thickening of vasculosyncytial membrane (arrow).

Fig. 2 (Right): Placental villi showing the Hofbauer cells within the edema, fibrin deposition, and infarction villi.
Table (1): Placenta variables of normal and GDM groups included in the study.

<table>
<thead>
<tr>
<th>Placental variable</th>
<th>Normal n=40</th>
<th>GDM n=40</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placental weight(gm)</td>
<td>558±27.1</td>
<td>658±36.5</td>
<td>*</td>
</tr>
<tr>
<td>Central thickness(mm)</td>
<td>17.91±4.67</td>
<td>22.7±3.44</td>
<td>*</td>
</tr>
<tr>
<td>Placental diameter (mm)</td>
<td>154.5±6.63</td>
<td>167.1±12.22</td>
<td>*</td>
</tr>
<tr>
<td>Insertion of umbilical Cord</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eccentric</td>
<td>37</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Centric</td>
<td>3</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Marginal</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Velamentous</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>No cotyledons per placenta</td>
<td>(19.95±3.42)</td>
<td>(20.55±5.06)</td>
<td>*</td>
</tr>
<tr>
<td>Vascular pattern</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magistral</td>
<td>10</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Dispersal</td>
<td>30</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Perinatal outcome</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth Weight (g)</td>
<td>3608±104</td>
<td>3659±123</td>
<td>*</td>
</tr>
<tr>
<td>Fetoplacental Weight Ratio</td>
<td>6.8±0.3</td>
<td>5.8±0.5</td>
<td>*</td>
</tr>
<tr>
<td>Sex male/female</td>
<td>24/16</td>
<td>19/21</td>
<td></td>
</tr>
<tr>
<td>Preterm birth</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Apgar score</td>
<td>8.8±0.7</td>
<td>7.8±0.9</td>
<td>*</td>
</tr>
</tbody>
</table>

* = significant p-value

Values are presented as mean±SD.* significant. TV from GDM placenta showing the increased number of blood vessels (Chorangiosis).

Table (2) Characteristics of Blood Vessels in TV of normal and GDM groups included in the study.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Control</th>
<th>GDM</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number Blood Vessels in TV/field (mm³)</td>
<td>10.50±3.33</td>
<td>19.87±9.62</td>
<td>0.0001</td>
</tr>
<tr>
<td>Diameter of Blood Vessels in TV (mm)</td>
<td>0.04±0.03</td>
<td>0.03±0.02</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Table (3) Comparison variables of hormones in GDM and normal groups.

<table>
<thead>
<tr>
<th>Variables of hormones</th>
<th>GDM</th>
<th>Non GDM</th>
<th>P- value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBG (mmol/l)</td>
<td>6.30±1.02</td>
<td>4.31±1.02</td>
<td>*</td>
</tr>
<tr>
<td>β-HCG</td>
<td>5001.0±0.01</td>
<td>4021±180.11</td>
<td>*</td>
</tr>
<tr>
<td>P4 (ng/ml)</td>
<td>72.74±10.53</td>
<td>44.83±14.81</td>
<td>*</td>
</tr>
<tr>
<td>E2 (pmol/L)</td>
<td>4501.01±1334.33</td>
<td>2480.52±1297.5</td>
<td>*</td>
</tr>
</tbody>
</table>

* = p < 0.05 was considered statistically significant

Discussion

This study was started to determine the comparative between morphological observation of normal and GDM groups included variables as the following table (1).

Site of umbilical cord insertion eccentric and central in most of placentas except in three cases in which there was marginal insertion and two cases velamentous of placenta in GDM group. Vascular magistral pattern was one case in the GDM group while it was more frequently observed in the normal group. The dispersal pattern showed successive divisions of umbilical vessels with decreasing caliber from center to periphery while the magistral pattern showed fewer divisions of blood vessels.
with noticeably no decrease in diameter from center to periphery. Reduction of uteroplacental circulation results in foetal hypoxia & intrauterine growth restricted IUGR. Because macrosomia affects the fetal portion of the placenta, the placental weight, diameter, and central thickness in diabetic mothers increase. The basal lamina of the chorionic capillaries is part of the placentation barrier increase in its thickness. The result of recent study is sex male/female was 24/16 vs 19/21 this observation agreement with study. Macrosomic newborns are at an increased risk with preterm birth and hypoglycemia. GDM is associated with an increased risk of additional pregnancy complications, including preterm birth and surgical delivery of the baby is required. In this study Apgar score the mean was 8.9±0.5 vs7.3±0.2, the mean of Apgar score was less than normal group. A study of 94 patients with GDM showed lower Apgar scores and increased incidence of perinatal morbidity of neonates compared to neonates of mothers without impaired glycemic control. GDM appears to effect the microvascular remodeling at angiogenesis at 3rd trimester of pregnancy. insulin as a key factor playing a modulatory role in GDM-associated altered angiogenesis. The angiogenic response to VEGF not only depends on its total concentration, but also on the spatial Vascular magistral pattern was one case in the GDM group while it was more frequently observed in the normal group. The dispersal pattern showed successive divisions of umbilical vessels with decreasing caliber from center to periphery while the magistral pattern showed fewer divisions of blood vessels with noticeably no decrease in diameter from center to periphery. Reduction of uteroplacental circulation results in foetal hypoxia & intrauterine growth restricted IUGR. These factors lead to endothelial cell organization within vessels as tip and stalk cell phenotypes ultimately resulting in dynamic developing and branching angiogenesis.

Increased number of capillaries (Chorangiosis). Thickened vessel walls due to endothelial proliferation and thickening of the basement membrane were also identified. Infraction of the villi, fibrin depositions were found in the placenta on histological observations. The decreased elasticity of vessel wall leads to vascular hardening and increased susceptibility to arteriosclerosis, which can lead to a narrowing of the maternal blood vessel lumens, reducing the uteroplacental circulation and thickness of the placentation barrier. It has been seen that increased blood glucose levels induce oxidative stress (OS) and subsequent changes of the placentation architecture. essentially the vascular properties, which are apparent in GDM. Placental Hofbauer cells (HBCs) even in low-grade inflammatory states such as GDM. It is concerned in placental vasculogenesis and angiogenesis. This indicates a regulatory, tissue remodeling rather than an inflammatory macrophage phenotype. Also, it was shown that even inflammatory pathologies. HBC are thought to play a role in maternal immunological tolerance against the fetus. The basal lamina of the chorionic capillaries is part of the placentation barrier; therefore, the increase in its thickness will make the placentation barrier thicker overall, which can lead to a reduction in the oxygen transport and other nutrients through the barrier. In response to this reduction in pO2, the terminal villi exhibit a hyperplasia that may be partially responsible for the increased placental weight in the diabetic group. The distance between maternal and fetal circulation is increased because of an increase in the chorionic villi on the surface as well as greater thickness of the syncytiotrophoblast basal membrane due to an increased type IV collagen deposition. The stroma between the villi is edematous, the capillary surface is enlarged due to of vascular neoformation and a greater penetration of these vessels within the villi. Low oxygen partial pressure (pO2) was noticed, which would produce hyperplasia of terminal chorionic villi. In GDM the placenta suffers alterations are correlated to an oxygenation lack in the fetus and variations in the transplacental conveyance of nutrients and other alterations, causing fetal overgrowth by increasing their availability and adverse outcome. Chorangiosis was defined as the occurrence of 10 or more villi with 10 or more capillaries in 10 or more low power microscopic fields (×10). Hydropic villi were diagnosed when large terminal villi were present with edematous fluid and villous macrophages in placenta of GDM. Fetal vessel thrombosis was diagnosed when a large fetal stem villous vessel was partially or completely occluded by a thrombus. Avascular villi were diagnosed when a group of at least five fibrotic avascular villi without inflammation were seen. These trophoblasts are able to invade and remodel maternal tissues (interstitial EVT) and uterine spiral artery (endovascular EVT), leading to the widening of artery lumen by remodeling normally, reducing the resistance against blood flow that irrigates the fetus. They recommends that all women undergo a fasting plasma glucose (FPG) test at their first prenatal visit (where a reading ≥92 mg/dL is revealing of GDM), and that women with FPG <92 mg/dL undergo a 2-h 75 g oral glucose tolerance test (OGTT) between 24 and
28 weeks’ gestation.\textsuperscript{19} The hormones produced by EVT contribute to vascular and uterine tissue remodelling and to regulate EVT migration and invasion.\textsuperscript{1} They demonstrated that patients with HCG > 1.04 MoM (Multiple of the Median) and unconjugated E\textsubscript{3} (uE\textsubscript{3}) ≤ 0.88 MoM measured in a triple test were associated with GDM development.\textsuperscript{20} Human chorionic gonadotropin (hCG) is a pregnancy-specific hormone that regulates placental development. hCG concentrations vary widely throughout gestation and differ based on fetal sex. Abnormal hCG concentrations are associated with adverse pregnancy outcomes including fetal growth restriction. This was the case for both male and female fetuses. In contrast, high hCG concentrations during the late first trimester were associated with increased fetal growth amongst female, but not male fetuses. Low hCG in the late first trimester is associated with lower birth weight due to a decrease in fetal growth. Fetal sex differences exist in the association of hCG concentrations with fetal growth.\textsuperscript{21} It was reported that the concentrations of the steroids (progesterone and estrogen) are increased in women with GDM.\textsuperscript{22}

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Kufa College of Science and all experiments were carried out in accordance with approved guidelines.

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Coinfection of Enteric Viruses in Elderly Patients with and without Acute Gastroenteritis in Hilla City

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Abstract

This study was conducted to find out the extent of the presence of mixed viral infections for elderly people with and without acute enteritis. 100 stool samples were collected, 50 samples of which were for people with acute enteritis and the other 50 samples were from non-infected people. These mixed infections were obtained within the group of infected patients, where the age group 45-49 was the most infected and then the sample was prepared by making several treatments For the purpose of performing the PCR molecular test. As the results of this test indicated that 15 samples contain Astrovirus from the total number of samples. And 7 samples containing norovirus from the total number of samples. while the test recorded 10 samples containing the sapovirus from the total number of samples. The study showed that the relationship between acute gastroenteritis and gender revealed that male infection is close to female infection, as there is no significant difference between them. In regard to mixed infection the study showed that the number of samples infected with Rota, Adeno, and Astro viruses was 4 positive samples, while the number of samples containing Rota adenonoro is only one positive sample is the same as the number of samples containing only Astro and Noro that were recorded as a result of acute enteritis. The results also indicated that three coinfection positive samples of rota, adeno and sapo. As tested by Rapid test and PCR technique.

Keywords: Coinfection, norovirus, sapovirus, elderly.

Introduction

Acute gastrointestinal is one of the most common diseases in humans, and continues to be a significant cause of mortality and morbidity worldwide. Recently the estimates of mortality associated with diarrhea declined, however the majority of deaths still occur in developing countries and thus urgent intervention is needed for the prevention of these diseases. The incidence of acute gastrointestinal infection rises in the aged group under five years and in those aged over 75. At all ages incidence in men was higher than in women in elderly patients¹. The common enteroviral infection rotavirus, adenovirus, astrovirus, norovirus and sapovirus the most common etiology of acute gastroenteritis (AGE) among infants and young children. Acute gastrointestinal symptomatology—including diarrhea and nausea/vomiting—in patients². Rotaviruses are non-enveloped double-stranded RNA (dsRNA) viruses that have a complex architecture of three concentric capsids that surround a genome of 11 segments of dsRNA³. Human adenoviruses (HAdVs) are nonenveloped, double-stranded DNA viruses in the family Adenoviridae; seven species (A–G) and >60 genotypes are known to cause human infection⁴. Astroviruses are nonenveloped, positive-sense single-stranded RNA viruses that cause gastrointestinal illness⁵. Human noroviruses have a non-segmented positive-strand RNA genome, of approximately 7.5 kb⁶. Sapovirus, a member of the Caliciviridae family, is a single-stranded positive sense RNA virus, with 4 genogroups, that infect humans ⁷.

Materials and Method

During a period (from September 2019 to January 2020) 100 stool sample from adults (equal to or more than 45 years) who were hospitalised with or without acute gastroenteritis (AGE) their primary diagnosis for in enteric virus from four hospitals in the Babil Governorate Region with a total population of 18000,000 people.
These samples were taken from (Imam Sadiq Hospital, Al-Kiif Hospital, Margan Hospital and Hashemia Hospital).

Stool samples were collected in clean sterile containers within 48 hours of admission. Each sample was labeled according to the date of collection and the sample number. The samples were kept at 4°C at the hospital before being transported to the College.

Rapid test of Rotavirus and Adenovirus (Zaragoza, Spain), stool samples and controls to reach room temperature (15-30) prior to testing. The test performed according to company instructions.

Viral RNA was extracted from stool samples by using AccuZol™ Total RNA extraction kit (Bioneer, usa) and done according to company instructions.

PCR test.

PCR was performed for molecular detection of virus based on core protein. This method was done according to\(^8\).

PCR master mix was prepared by using (AccuPower® PCR PreMix) and done according to the company instructions.

The PCR primers used for direct detection of Norovirus, Astrovirus and Sapovirus were designed by\(^9\) and PCR primers were designed in this study using NCBI Database and primer 3 plus and these primers were provided by (Macrogen. Company, Korea)

**Result and Discussion**

The total positively rate of combined viral infection in elderly patient with acute gastrointestinal infection in relation to age.

Among the 50 samples collected from elderly individuals patient with gastrointestinal symptoms the age distribution of positively rate of viral infection (rotavirus, adenovirus, astrovirus, norovirus and sapovirus) infections was detected in the age group 45-49 years were 12 at 24% for each rotavirus and adenovirus while astrovirus recorded 6 at 12% and norovirus recorded 2 at 4% followed by 9 at 18% for rotavirus and adenovirus while astrovirus has 5 at 10% The norovirus has 2 at 4% sapovirus has one infected at 2% at the age group 50-54. At The age groups 55-59, 60-64 and 65-69 years show 6, 2 and 1 for every rotavirus and adenovirus respectively at a percentage 12%, 4% and 2% while astrovirus has 1 at 2% At The age groups 55-59, sapovirus recorded one infected for each these group 55-59 65-69 and 70-74 at 2% (table 1).

**Table 1. The total of positively rate of poly- viral infection in elderly patient with acute gastrointestinal infection in relation to age.**

<table>
<thead>
<tr>
<th>Age groups</th>
<th>Rotavirus</th>
<th>Adenovirus</th>
<th>Astroviurs</th>
<th>Norovirus</th>
<th>Sapovirus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>45-49</td>
<td>12</td>
<td>24%</td>
<td>12</td>
<td>24%</td>
<td>6</td>
</tr>
<tr>
<td>50-54</td>
<td>9</td>
<td>18%</td>
<td>9</td>
<td>18%</td>
<td>5</td>
</tr>
<tr>
<td>55-59</td>
<td>6</td>
<td>12%</td>
<td>6</td>
<td>12%</td>
<td>1</td>
</tr>
<tr>
<td>60-64</td>
<td>2</td>
<td>4%</td>
<td>2</td>
<td>4%</td>
<td>Nil</td>
</tr>
<tr>
<td>65-69</td>
<td>1</td>
<td>2%</td>
<td>1</td>
<td>2%</td>
<td>Nil</td>
</tr>
<tr>
<td>70-74</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>≥75</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>60%</td>
<td>30</td>
<td>60%</td>
<td>12</td>
</tr>
</tbody>
</table>

\(p\_value \leq 8.34\)

The total positively rate of combined viral infection in elderly patient with acute gastrointestinal infection in relation to sex.

The results of relation between occurrence of AGI and gender shown that the positive among male 13 of patients AGI for every rotavirus and adenovirus at
26%, astrovirus has 9 at 18%, norovirus has 3 at 6% and sapovirus has 2 at 4% while female the positive were 16 of patients AGI for rotavirus and adino virus at 32%, astrovirus has 2 at 4%, norovirus has 1 at 2% and sapovirus has 2 at 4% (table 2).

Table 2. The total positively rate of poly-viral infection in elderly patient with acute gastrointestinal infection in relation to sex.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Roravirus</th>
<th>Adinovirus</th>
<th>Astrovirus</th>
<th>Norovirus</th>
<th>Sapopvirus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Male</td>
<td>13</td>
<td>26%</td>
<td>13</td>
<td>26%</td>
<td>9</td>
</tr>
<tr>
<td>Female</td>
<td>16</td>
<td>32%</td>
<td>16</td>
<td>32%</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>58%</td>
<td>29</td>
<td>58%</td>
<td>11</td>
</tr>
</tbody>
</table>

*p_value ≤ 9.11

Viruses infect host cells releasing their genome (DNA or RNA) containing all information needed to replicate themselves. The viral genome takes control of the cells and helps the virus to evade the host immune syste10.

Infectious diarrhea is an important cause of morbidity and mortality among the elderly in the United States. The full scope of its impact has been recognized more in recent years11 can be life threatening in an elderly immunocompetent individual. The whole gastrointestinal tract can be affected by viral, however, small bowel was rarely the only site of disease, In elderly individuals, even though they are immunocompetent, may result in major complications such as bowel perforation, and it should be included in the differential diagnosis of diarrhea if it is resistant to conventional treatment21. Acute diarrheal illness is a global health problem that causes immense human misery. Military history is testament to the overwhelming power of acute diarrheal illness: Napoleon Bonaparte’s army, soldiers of the American Civil War, and German forces of World War II were pillaged by enteric infections. The French Expeditionary Force to Indochina was stricken with many enteric infections. These infections hampered military efforts and were deemed to have played a pivotal role in military defeats. The significance of enteric infection in military campaigns contributed to the US Army’s surgeon general’s decision to establish a team to assess the magnitude and to determine the cause of diarrheal outbreaks among American troops in Vietnam. With the exception of fevers of undetermined origin, diarrheal diseases were responsible for more hospital admissions than any other diseases13. The total positively rate of combined viral infection in heathy elderly individuals in relation to age. Among the 50 samples collected from elderly individuals without acute gastrointestinal infection the age distribution of positively rate of viral infection(rotavirus, adenovirus, astrovirus, norovirus and sapovirus) infections was detcated in the age group 45-49 years only astrovirusrecored 2 at 4% while astrovirus and norovirus have 1 at 2% at the age group 50-54. At The age groups 55-59 for aeah one astrovirus and sapovirus have only one infected at 2% while in this age group norovirusrecored tow infected at 4% when sapovirusrecored one infection at 2% at age group 70-74 (table 3).

Table 3. The frequency of total positively rate of polyviral infection in heathy elderly individuals in relation to age

<table>
<thead>
<tr>
<th>Age group</th>
<th>Roravirus</th>
<th>Adinovirus</th>
<th>Astrovirus</th>
<th>Norovirus</th>
<th>Sapopvirus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>45-49</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>2</td>
</tr>
<tr>
<td>50-54</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>1</td>
</tr>
<tr>
<td>55-59</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>1</td>
</tr>
<tr>
<td>≥64</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>3</td>
</tr>
</tbody>
</table>

*p_value ≤ 1.29
The total positive rate of combined viral infection in healthy elderly individuals in relation to sex.

The results of relation between occurrence of without AGI and gender shown that the positive among male astrovirus has 3 at 6%, norovirus has 2 at 4% and sapovirus has 3 at 6% while female the positive were astrovirus and norovirus have 1 at 2% for every one and sapovirus has 3 at 6% (table 4).

<table>
<thead>
<tr>
<th>Gander</th>
<th>RotaVirus</th>
<th>Adenovirus</th>
<th>Astrovirus</th>
<th>Norovirus</th>
<th>Sapovirus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Nil</td>
<td>Nil</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Female</td>
<td>Nil</td>
<td>Nil</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>Nil</td>
<td>Nil</td>
<td>4</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

*p_value ≤ 1.48

Adults more than 65 years of age were the age group most commonly affected.

The mixed viral infection in elderly individuals with and without acute gastrointestinal infection

This figure showed the mixed viral infection in 100 sample collected from elderly individuals with and without symptoms. The mixed infection were found between rotavirus, adenovirus and astrovirus were more domine at 4% followed by rotavirus, adenovirus and sapovirus 3%. Then rotavirus, adenovirus and norovirus 1%, and the double infection were noticed between astrovirus and norovirus at 1% (Figure 4-1).

![Virus](image)

Figure (1) The distribution mixed viral infection in elderly individuals with and without acute gastrointestinal infection.
This could be explained by a close-knit family environment where the elderly frequently look after their grandchildren. Vomiting was, thus, associated with viral pathogens. Various factors influence symptoms and signs, including pathogen and host factors, infectious load, and mixed infections. The English re-examination study showed that about 40% of symptomatic patients harbored mixed infections the occurrence of mixed infections suggests that a wide test panel should be applied in some cases, such as for food handlers. Selective testing is necessary for cost efficiency and is widely practiced\textsuperscript{19}. Antibodies were found in 10% of serum samples from the aged. Of patients with acute gastroenteritis, showed a significant rise in antibody to adenovirus, and of the same serum samples had a significant rise in antibody to rotavirus by enzyme immunoassay \textsuperscript{20}. The PCR results of stool sample from acutgastrointestinal infection showed that the produce analysis Astrovirus form exacerbated RNA stool of patients with AGI positive for gives 15 sample with positive Astrovirus at 523bp PCR produce these results indicate the presence of Astrovirus during exacerbated of AGI while may indicated the chance of association with AGI.

![Figure (2): Agarose gel electrophoresis image that show the PCR product analysis of Astrovirus, where ladder (1500-100bp), some positive samples at (523bp) PCR product.](image1)

The PCR results of stool sample from acutgastrointestinal infection showed that the produce analysis Norovirus form exacerbated RNA stool of patients with AGI positive for gives 7 sample with positive Astrovirus at 560bp PCR produce these results indicate the presence of Norovirus during exacerbated of AGI while may indicated the chance of association with AGI.

![Figure (3): Agarose gel electrophoresis image that show the PCR product analysis of Norovirus, where ladder (1500-100bp), some positive samples at (560bp) PCR product.](image2)
The PCR results of stool sample from acute gastrointestinal infection showed that the produce analysis Sapovirus form exacerbated RNA stool of patients with AGI positive for gives 10 sample with positive Sapovirus at 401bp PCR produce these results indicate the presences of Sapovirus during exacerbated of AGI while may indicated the chance of association with AGI.

Figure (4): Agarose gel electrophoresis image that show the PCR product analysis of Saprovirus, where ladder (1500-100bp), some positive samples at (401bp) PCR product.

Sapovirus,astrovirus and Norovirus increasingly are recognized as cause of acute viral gastroenteritis (AGI). We evaluated the RT-PCR viral stool panel for detection of SaV, AstV and NoV in clinical stool samples.

A total of stools were tested using reverse transcription RT-PCR, PCR to detect and quantify SaV, AstV and NoV were detected in many age groups, especially in the elderly.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Babylon and all experiments were carried out in accordance with approved guidelines.

References
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Oral Fordyce’s Granules and Serum Lipid Profile; any Relationship?

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Department-Oral Medicine

Abstract

Background: Sebaceous glands are normal structures of the skin, but may be ectopically found in the mouth, as oral Fordyce granules. They are located just beneath the overlying epithelium and are visible through the epithelium producing local elevations. It has been suggested that there is a relation between elevated lipid profile and the presence of these granules.

Method: A total of 130 individuals were included in this cross-sectional study, who were subjected to the oral examination for the presence & scoring of oral Fordyce granules, then blood samples were taken. Case sheet involved, demographic information and medical history. Using specialized kits, lipids profile analysis was done on a fully automated spectrophotometric analyzer.

Results: Fordyce granules were recorded in 25% of cases, with males formed the majority of them. In both gender, lip was the most commonly affected sites. Fordyce granules were observed in one-third of patients with systemic diseases.

The majority of cases with Fordyce granules, recoded normal triglyceride, HDL, LDL and VLDL levels, but one-fourth of patients with hyper cholesterol were seen with Fordyce granules. Chi-Square test showed no association between lipid profile & these granules.

A negative correlation was found between Fordyce granules number and cholesterol, HDL and LDL levels, although statistically non-significant.

Conclusion: Oral Fordyce granules were most frequently observed in the lips, with male gender and older age predilections. The current study did not support the association between oral Fordyce granules and serum lipid profile changes.

Keywords: Oral Fordyce granules, lipid profile.

Introduction

Sebaceous glands are normal structures of the skin but may also be found ectopically in the mouth, where they are referred to as oral Fordyce granules or ectopic sebaceous glands.1

Fordyce granules (FGs) are ectopic sebaceous glands located on the mucosal surface of the oral cavity which may be considered as a variation of normal anatomy2. These spots are typically present as small asymptomatic, multiple whitish, or yellowish 1-3-mm sized papules3-5. The glands are located just beneath the overlying epithelium and often produce a local elevation of the epithelium6.

Fordyce granules are often discovered during routine dental examinations which are mainly seen on the labial and buccal mucosa in adults7.

The common site for Fordyce’s granules is vermillion border and lips, with buccal mucosa particularly inside the commissures and retro molar region has also been suggested as common site8.

Studies reported that FGs are not usually visible in
children, and tend to appear at about age 3, then during puberty and become more obvious in later adulthood\textsuperscript{8}.

Some studies showed that they are more prominent in males while, other studies reported no significant difference in the prevalence between both genders\textsuperscript{9}.

Few patients were seen with hundreds of granules while the majorities were seen with only one or two.

Etiologically, it is not known what causes FGs, but some studies have linked their development to hormonal changes and genetic; and they are not known to be associated with any disease or illness and are of cosmetic concern only. While, some authorities believed that FGs are seen in some rheumatic disorders and in hereditary non-polyposis colorectal cancer syndrome\textsuperscript{10}.

Lipid is an important for normal cell function, with normal level of cholesterol is a vital component of cell membranes structure. It is also involved in many enzymatic processes and genetic stability\textsuperscript{11,12}.

Considering lipid profile, total cholesterol (TC) measures all the cholesterol in all the lipoprotein particles. High-density lipoprotein (HDL) measures the cholesterol in HDL particles takes up excess cholesterol and carries it to the liver for removal. Low-density lipoprotein (LDL) measures the cholesterol in LDL particles, it deposits excess cholesterol in walls of blood vessels, which can contribute to atherosclerosis. This can be calculated using the results of total cholesterol, HDL and triglycerides (TG). Triglycerides measure all the triglycerides in all the lipoprotein particles; most of it is in the very low-density lipoproteins (VLDL)\textsuperscript{13}.

A study showed that individuals with an elevated lipids profile tend to have oral FGs and may be with higher numbers compared to normal range of lipid profile\textsuperscript{14}.

A very few research in this topic, and to date, no study has been published to describe the clinical manifestation of FGs and lipids profile in Iraqi population. Thus, the present study was designed to investigate the prevalence and relationship between serum lipids profile with oral FGs in relation to demography and medical history of patients.

**Material and Method**

The protocol of this observational cross sectional study was reviewed and approved by the Ethical Committee of the Oral Diagnosis Department of the College of Dentistry- University of Baghdad. The written informed consents were obtained from all recruits, after clearly explained the protocol to the participants, and detailed information about the study and the blood samples collection.

From September 2019 to March 2020, a total of 130 participants attended Al-America primary health center in Al-America sector in Baghdad, who were sent for serum lipids profile tests, were enrolled in this study. During their follow up, those patients were already asked to fast overnight approximately 8-12 hours to test their lipids profile.

The subjects were excluded if they had a major illness in recent past or were taking or had previously taken any medications known to influence lipid levels metabolism in the past 6 months.

Case sheets were filled for the patients who gave their consent form to participate in this study. Case sheet includes demographic information such as age, gender, marital status, number of children. The individuals were also questioned about systemic diseases.

During the same visit of taking the blood samples, oral examination of each participant’s mouth, was performed by the oral medicine specialist (author) focusing on the presence of the FGs in the oral cavity. Recording their location and the number, using five scoring system: Group 1: 0 granules, Group 2: up to 10 granules, Group 3: up to 30 granules, Group 4: 30 to 100 granules and Group 5: more than 100 granules.

Under sterile conditions, 4-5 milliliters of venous blood was collected after an overnight fast, from antecubital vein in vacuumed blood collection tubes with gel and were labeled with an individual patient ID, then serum was extracted after centrifugation for 15 minutes (2000 rpm).

Estimation of serum lipids profile was done on a fully automated analyzer based on spectrophotometric principle using enzymatic colorimetric method kits. The serum lipid profile was analyzed on the same day of the withdrawal of blood samples.

Plasma levels of TC, TG, HDL were estimated using enzymatic colorimetric test (Linear Chemicals S.L.U, SPAIN). VLDL and LDL were calculated using the formula given below: 

\[
\text{VLDLC} = \frac{\text{TG}}{5} \\
\text{LDLC} = \text{TC} - \text{VLDLC} - \text{LDLC}
\]
Statistical Analysis: Data analysis was performed using Statistical Package of Social Sciences software version 20.

Descriptive statistics were obtained for all variables in the study with means, standard deviations and standard error of mean (SEM) were applied as appropriate.

Analysis of variance (ANOVA), student T-test, Chi-Square test, Fisher’s Exact and correlation coefficients tests were used. A p-value of less than 0.05 was considered to indicate statistical significance.

Results

1. Patients Demography: In this study, 130 participants were included, with an age range of 20-79 years and a mean age of 51.4 years. Patients were divided into three age groups; 20-39, 40-59 and 60-79 years, with the age group 40-59 years, formed the majority of patients, followed by the older age group 60-79 years.

The majority of patients were males 75 (57%) with males mean age was 52.9 years. Females were younger than males with a mean age of 49.6 years.

2. Fordyce’s granules distribution in the oral cavity: Thirty-two patients (25%) out of 130, were with FGs. Twenty-four (75%) were recorded in the lips and 12 were recorded in the cheek (4 cases were with both lips and cheek). Considering the number of FGs, the majority of patients were with ≈ 10 granules per location, with only one patient was with more than 100.

The majority of patients were males 75 (57%) with males mean age was 52.9 years. Females were younger than males with a mean age of 49.6 years.

3. Fordyce’s granules, Age, Gender, Medical history and Lipid profile tests: The mean age of males with FGs (54 years) which was higher than that of females with FGs (49.3 years).

Regarding gender, out of the 32 patients with FGs, 22 were males forming 69% and 10 (31%) were females. In both gender, lips showed the most common oral sites for these granules. Considering males, 14 were with lips FGs and 8 were with cheek granules. Similarly, in females lips recorded more FGs (6 out of 10).

In the current study, the majority of participants were with systemic diseases (90, 69%) while rest 40 (31%) were without any systemic diseases. The majority of patients (54, 42%) were previously diagnosed with hypertension, followed by both hypertension and diabetes mellitus (23, 18%) and only 13 (10%) were with a diabetes mellitus only.

Considering gender, those with systemic disease, 55 were males and 35 were females. While those without any systemic diseases, 19 were males and 21 were females.

The majority of patients (66%; 21/32) with systemic diseases were with FGs, and all of them were with lips involvement, but only 3 cases with FGs, were without any systemic diseases.

As shown in Table (1), hypertensive patients showed higher mean cholesterol, triglyceride, HDL and VLDL compared to patients with diabetes and those suffered from both hypertension and diabetes mellitus together. While patients with both hypertension and diabetes showed higher mean values for LDL. Students t-test showed no significant difference between different systemic diseases in mean lipids value.

As shown in Table (2), a higher mean lipid value was seen in females in cholesterol and LDL, while higher means were seen in males in triglyceride, HDL and VLDL. However, t-test showed no significant differences.

Fordyce’s granules, Cholesterol and Triglyceride

Both cholesterol and triglyceride levels were divided into 3 levels; normal range, border line and high range level, which subsequently scored as 0,1 and 2, respectively; Table (3).

One-fourth of cases with hyper cholesterol were seen with FGs; however, Chi-Square test showed no association between cholesterol level and oral FGs (1.214, df:2, p=0.545).

The majority of cases were with normal level, followed by high and then border line values.

The majority of FGs cases, were with normal triglyceride and ≈ 1/3 of cases with higher triglyceride. Chi-Square test showed no association between triglyceride level and FGs (1.556, df:2, p=0.459). Considering gender, the majority of males were seen with high level range of triglyceride compared to females.

Fordyce’s granules, HDL, LDL and VLDL

High density lipoprotein, LDL and VLDL levels were divided into 2 scores; Table (4). Cases with
FGs were commonly seen with normal HDL values, followed by the higher HDL levels; Chi-Square test showed no association between HDL and FGs (0.192, df:1, p=0.661), although half of cases with hyper LDL were seen with FGs.

Similarly, LDL showed no association with presence of FGs (0.002, df:1, p=0.966); an equal number of FGs were seen in normal and high level scores.

Regarding VLDL, the majority of cases were within normal range values followed by the high values.

Although, the majority of both gender recorded normal VLDL, males were seen with higher VLDL values compared to females. FGs cases were nearly equally in number in normal and high VLDL level. Chi square test showed no association between VLDL and FGs (0.761, df:1, p=0.383), although ≈ half of FGs cases were observed with high LDL levels.

4. **Hyperglycemia:** In this study, overlap records were seen in recording higher levels of lipids profile. Using just the higher lipid score values for the all 5 lipids, cases with higher levels of LDL and VLDL were commonly seen with positive FGs, followed by those with higher HDL, triglyceride and cholesterol.

However, Chi square test showed no association between the presence FGs and each type of lipid with its higher recorded levels (0.457, df=4, p=0.978); Table (5).

Using cases with different types of hyperlipidemia to study the association with FG, Fisher’s Exact Test showed no association between FGs and hyperlipidemia in only, one type of lipid, 2 types, 3 types, 4 types and all the 5 types of lipid profile (P=0.65).

5. **Correlations between study parameters:** Using Pearson correlation, although no significant correlation was found between FG count and the five lipid profile values; there is a negative relations between FG number and cholesterol, HDL and LDL; Table (6). Also, a negative but no significant correlation was recorded between HDL and oral FGs, using the scores for each type of lipids (r = -0.040, p=0.664).

### Table (1): Mean lipid values in patients with different systemic diseases.

<table>
<thead>
<tr>
<th>Lipid profile</th>
<th>Systemic disease</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholesterol</td>
<td>Hypertension and Diabetes</td>
<td>19</td>
<td>200.11</td>
<td>42.76</td>
<td>9.81</td>
</tr>
<tr>
<td></td>
<td>Diabetes</td>
<td>12</td>
<td>192</td>
<td>40.94</td>
<td>11.82</td>
</tr>
<tr>
<td></td>
<td>Hypertension</td>
<td>46</td>
<td>203.26</td>
<td>55.47</td>
<td>8.18</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>Hypertension and Diabetes</td>
<td>19</td>
<td>135.32</td>
<td>69.46</td>
<td>15.94</td>
</tr>
<tr>
<td></td>
<td>Diabetes</td>
<td>12</td>
<td>146.42</td>
<td>66.15</td>
<td>19.1</td>
</tr>
<tr>
<td></td>
<td>Hypertension</td>
<td>46</td>
<td>158.87</td>
<td>84.79</td>
<td>12.5</td>
</tr>
<tr>
<td>HDL</td>
<td>Hypertension and Diabetes</td>
<td>18</td>
<td>38.17</td>
<td>5.54</td>
<td>1.31</td>
</tr>
<tr>
<td></td>
<td>Diabetes</td>
<td>11</td>
<td>36</td>
<td>3.38</td>
<td>1.02</td>
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<td>Hypertension</td>
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<td>41.72</td>
<td>11.98</td>
<td>1.77</td>
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<tr>
<td>LDL</td>
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<td>127.83</td>
<td>39.22</td>
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<td></td>
<td>Diabetes</td>
<td>10</td>
<td>125.5</td>
<td>28.42</td>
<td>8.99</td>
</tr>
<tr>
<td></td>
<td>Hypertension</td>
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<td>122.54</td>
<td>41.39</td>
<td>6.1</td>
</tr>
<tr>
<td>VLDL</td>
<td>Hypertension and Diabetes</td>
<td>18</td>
<td>26.06</td>
<td>13.76</td>
<td>3.24</td>
</tr>
<tr>
<td></td>
<td>Diabetes</td>
<td>11</td>
<td>29.15</td>
<td>11.12</td>
<td>3.35</td>
</tr>
<tr>
<td></td>
<td>Hypertension</td>
<td>45</td>
<td>35.09</td>
<td>25</td>
<td>3.73</td>
</tr>
</tbody>
</table>
Table (2): Lipid profile in relation to gender in the study group

<table>
<thead>
<tr>
<th>Type of Lipids</th>
<th>Gender</th>
<th>No.</th>
<th>Mean ± SD</th>
<th>± SE</th>
<th>t - test</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>♂</td>
<td>73</td>
<td>203.13</td>
<td>58.72</td>
<td>6.87</td>
<td>126</td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td>♀</td>
<td>55</td>
<td>208.14</td>
<td>41.29</td>
<td>5.56</td>
<td>126</td>
<td>0.59</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>♂</td>
<td>73</td>
<td>160.32</td>
<td>92.95</td>
<td>10.87</td>
<td>126</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>♀</td>
<td>55</td>
<td>139.18</td>
<td>70.14</td>
<td>9.45</td>
<td>126</td>
<td>0.16</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>♂</td>
<td>69</td>
<td>40.71</td>
<td>9.20</td>
<td>1.10</td>
<td>121</td>
<td>0.31</td>
</tr>
<tr>
<td></td>
<td>♀</td>
<td>54</td>
<td>38.94</td>
<td>10.25</td>
<td>1.39</td>
<td>121</td>
<td>0.31</td>
</tr>
<tr>
<td>HDL</td>
<td>♂</td>
<td>69</td>
<td>126.70</td>
<td>46.64</td>
<td>5.61</td>
<td>120</td>
<td>0.43</td>
</tr>
<tr>
<td></td>
<td>♀</td>
<td>53</td>
<td>132.76</td>
<td>35.06</td>
<td>4.81</td>
<td>120</td>
<td>0.43</td>
</tr>
<tr>
<td>LDL</td>
<td>♂</td>
<td>68</td>
<td>32.46</td>
<td>19.34</td>
<td>2.34</td>
<td>120</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>♀</td>
<td>54</td>
<td>28.69</td>
<td>18.62</td>
<td>2.53</td>
<td>120</td>
<td>0.27</td>
</tr>
</tbody>
</table>

Table (3): Cholesterol- Triglyceride range values in relation to age and gender

<table>
<thead>
<tr>
<th>Cholesterol</th>
<th>Score</th>
<th>Values (Mg/dl)</th>
<th>No</th>
<th>♀</th>
<th>♂</th>
<th>Mean &amp; age range (years)</th>
<th>Fordyce’s granules (Lips and cheeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>109-199</td>
<td>61</td>
<td>26</td>
<td>35</td>
<td>51(20-75)</td>
<td>48 Yes</td>
</tr>
<tr>
<td>Normal range</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Border line</td>
<td>1</td>
<td>200-239</td>
<td>35</td>
<td>16</td>
<td>19</td>
<td>55(23-79)</td>
<td>24 No</td>
</tr>
<tr>
<td>High level</td>
<td>2</td>
<td>240-384</td>
<td>32</td>
<td>13</td>
<td>19</td>
<td>48(22-79)</td>
<td>24 Yes</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>128</td>
<td>55</td>
<td>73</td>
<td></td>
<td></td>
<td>96 Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Triglyceride</th>
<th>Score</th>
<th>Values (Mg/dl)</th>
<th>No</th>
<th>♀</th>
<th>♂</th>
<th>Mean &amp; age range (years)</th>
<th>Fordyce’s granules (Lips and cheeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal range</td>
<td>0</td>
<td>49-148</td>
<td>74</td>
<td>32</td>
<td>42</td>
<td>53(22-79)</td>
<td>58 No</td>
</tr>
<tr>
<td>Border line</td>
<td>1</td>
<td>150-198</td>
<td>20</td>
<td>10</td>
<td>10</td>
<td>44.7(23-72)</td>
<td>13 No</td>
</tr>
<tr>
<td>High level</td>
<td>2</td>
<td>200-500</td>
<td>34</td>
<td>13</td>
<td>21</td>
<td>51.4(20-79)</td>
<td>25 No</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>128</td>
<td>53</td>
<td>73</td>
<td></td>
<td></td>
<td>96 Yes</td>
</tr>
</tbody>
</table>

Table (4): High density lipoprotein values in relation to age & gender

<table>
<thead>
<tr>
<th>HDL levels</th>
<th>Score</th>
<th>Values (Mg/dl)</th>
<th>No.</th>
<th>♀</th>
<th>♂</th>
<th>Mean age range (years)</th>
<th>Fordyce’s granules</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal range</td>
<td>0</td>
<td>24-39</td>
<td>68</td>
<td>31</td>
<td>37</td>
<td>51.8(20-79)</td>
<td>51 No</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>High level</td>
<td>1</td>
<td>40-78</td>
<td>54</td>
<td>23</td>
<td>31</td>
<td>49.6(25-79)</td>
<td>41 No</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>92</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LDL levels</th>
<th>Score</th>
<th>Values (Mg/dl)</th>
<th>No.</th>
<th>♀</th>
<th>♂</th>
<th>Mean age range (years)</th>
<th>Fordyce’s granules</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal range</td>
<td>0</td>
<td>19-129</td>
<td>63</td>
<td>27</td>
<td>36</td>
<td>52.8(20-75)</td>
<td>48 No</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>High level</td>
<td>1</td>
<td>130-300</td>
<td>58</td>
<td>26</td>
<td>32</td>
<td>49.5(22-79)</td>
<td>44 No</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>92</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VLDL</th>
<th>Score</th>
<th>Values (Mg/dl)</th>
<th>No.</th>
<th>♀</th>
<th>♂</th>
<th>Mean age range (years)</th>
<th>Fordyce’s granules</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal range</td>
<td>0</td>
<td>11.5-30</td>
<td>71</td>
<td>31</td>
<td>40</td>
<td>51.8(22-79)</td>
<td>56 No</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>High level</td>
<td>1</td>
<td>31-125</td>
<td>50</td>
<td>22</td>
<td>28</td>
<td>50.7(20-79)</td>
<td>36 No</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>92</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table (5): Higher lipid profile scores in relation to Fordyce’s granules

<table>
<thead>
<tr>
<th>Types of lipid</th>
<th>Score</th>
<th>Fordyce’s granules (Lips and cheeks)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>2</td>
<td>24</td>
<td>8</td>
</tr>
<tr>
<td>Trichlesteride</td>
<td>2</td>
<td>25</td>
<td>9</td>
</tr>
<tr>
<td>HDL</td>
<td>1</td>
<td>41</td>
<td>12</td>
</tr>
<tr>
<td>LDL</td>
<td>1</td>
<td>44</td>
<td>14</td>
</tr>
<tr>
<td>VLDL</td>
<td>1</td>
<td>36</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>170</td>
<td>57</td>
<td>227</td>
</tr>
</tbody>
</table>

Table (6): Correlation Coefficient between study parameters.

<table>
<thead>
<tr>
<th>Correlation Coefficient</th>
<th>Variables</th>
<th>Lips and cheeks -Fordyce account</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation Coefficient</td>
<td></td>
<td>.017-</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.851</td>
</tr>
<tr>
<td>Number</td>
<td></td>
<td>128</td>
</tr>
<tr>
<td>Cholesterol</td>
<td></td>
<td>.077</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.389</td>
</tr>
<tr>
<td>Number</td>
<td></td>
<td>128</td>
</tr>
<tr>
<td>Triglyceride</td>
<td></td>
<td>-.069-</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.446</td>
</tr>
<tr>
<td>Number</td>
<td></td>
<td>123</td>
</tr>
<tr>
<td>HDL</td>
<td></td>
<td>.033-</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.721</td>
</tr>
<tr>
<td>Number</td>
<td></td>
<td>122</td>
</tr>
<tr>
<td>LDL</td>
<td></td>
<td>.048</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.601</td>
</tr>
<tr>
<td>Number</td>
<td></td>
<td>122</td>
</tr>
<tr>
<td>VLDL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discussion

Oral Fordyce granules are often discovered during routine dental examinations. They are considered anatomic variations and are typically seen on the labial and buccal mucosa.14,7

The current study recorded FGs in 25% of the participants which is lower than what was recorded by Gaballah and Rahimi (2014)15, but it is higher than what was recorded (7.2%) by Tortorici et al., (2016)16 who studied the prevalence and distribution of oral mucosal non-malignant lesions.

Studies have investigated the relation of FGs with age, puberty and gender.17,18 According to Choudhry, the incidence increased with age, with 60-80% of patients were elderly.19 This agrees with this study which found that patients with FGs were older than those without FGs.

The current study showed that FGs were predominant in males and the majority of cases were with lips involvement, which agrees with Gorsky et al., (1986)20 who found that lips were the most common location for these granules (82.2%).

Also, Olivier (2006)9 found that FGs were mostly seen on the lips, followed by buccal mucosa, with no significant difference in the prevalence between males and females.

This completely agrees with the current study which reported that lips were the most common site, followed by cheek, but no significant difference between both gender.
Cardiovascular disease is the most common cause of death in industrialized countries and hyperlipidemia can lead to accelerated atherosclerosis and premature death from ischemic heart disease.\textsuperscript{21,22} The risk of developing atherosclerosis is directly related to the plasma LDL and inversely related to the HDL level.\textsuperscript{23,24}

Although, the majority of the previous studies did not find a relation between FGs and systemic diseases (Scully, et al., 2004). In the current study, one-third of patients with systemic diseases were with FGs.

Hypertensive patients showed higher mean values of cholesterol, triglyceride, HDL and VLDL compared to patients with diabetes and those suffered from both hypertension and diabetes mellitus together. This is supported by the findings of a recent study which found that diabetes mellitus, cardiovascular disease, liver and thyroid disease could also lead to changes in lipids profile.\textsuperscript{25}

In this study, no relation was found between FGs and cholesterol, triglyceride, HDL and VLDL levels, although between 1/4 and half of cases were with hyperlipidemia were observed with FGs. This may be due to the sample size or other confounder factors.

Cases with positive FGs recorded higher means cholesterol, triglyceride and VLDL values, but lower mean values of HDL and LDL, with males showed the highest VLDL levels.

This study reported a negative correlations between FGs number and cholesterol, HDL and LDL; however, non-significant. Further studies with larger number are required to be able to discuss these findings.

Because there are many factors affecting lipid metabolism and subsequent lipid profile levels. Recent progress in molecular biology may assist researchers in the near future to identify the genes and enzymes of lipid metabolic pathways and can understand the relation between each individual lipid and FGs in the oral cavity. Up to our knowledge, no study(s) considered these relations.

To conclude, the hyperlipidemia may contribute to the appearance of the oral FGs either by the increase fatty content of clinical undetectable glands making them easily visible during the oral examination or de novo differentiation of cells leading to more oral FGs. Both explanations require confirmation studies histochemically.

The findings of this study required larger population groups with wider age groups. Due to the fact that there are many factors affecting lipid metabolism, the inclusion criteria could lead to different conclusion.

Also, dentists as care providers for the oral cavity should be aware of the importance of referring patients with high density of FGs for lipid profile tests and then for an appropriate medical care especially those with risk factors for the cardiovascular system.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved and all experiments were carried out in accordance with approved guidelines.

**References**

9. Olivier JH. Fordyce granules on the prolabial and oral mucous membranes of a selected population. SADJ. 2006; 61: 072-074


Molecular Detection and Quantification Gene Expression of Efflux Pump Antibiotic Resistance Genes in Extensive Drug Resistance Pseudomonas Aeruginosa Isolated from Clinical Infection Patients in Al Diwaniyah City of Iraq

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Abstract

The study was included investigated 16 extensive drug resistance pseudomonas aeruginosa isolates which previously isolated from sputum, burns, urine, and ear swab clinical patients samples. The reverse transcription Real Time PCR (RT-qPCR) was performed for molecular detection and quantification of gene expression levels for efflux pump antibiotic resistance gene (mexA, mexB, mexC, mexE, and mexY) and chromosomal lactamase (AmpC) gene, as well as outer membrane prion protein (OprD) gene in extensive drug pseudomonas aeruginosa isolates. The relative expression analysis was done by used the 2-ΔΔCT (Livak) method, this method was used for normalization of expression levels (mRNA transcript levels) in target genes with suitable housekeeping gene. In this study 30S ribosomal protein S12 (rpsL) housekeeping gene was used in normalization of antibiotic resistance genes expression levels in extensive drug pseudomonas aeruginosa isolates. The efflux pump resistance gene expression were by RT-qPCR technique. The relative gene expression analysis were showed highest frequency of overexpression at (100%, 100%, 87.5%, 81.25%, 56.25%) for (mexB, mexE, mexA, mexC, and mexY) with fold change ranged (2.16- 184.82) fold change compared to wild type PA control isolate. The relative gene expression analysis of chromosomal lactamase AmpC gene was showed highest frequency of overexpression (100%) in XDR isolates with expression levels ranged (6.77- 73.1) fold change compared to wild type PA control isolate. Whereas, the relative gene expression analysis of OprD gene was showed (68.75%) frequency of down expression in XDR Pseudomonas aeruginosa isolates with expression levels ranged (0.01-0.16) fold change compared to wild type PA control isolate. In conclusion, The XDR Pseudomonas aeruginosa isolates can ability to over expression production of inducible chromosomal lactamase AmpC gene, efflux pumps protein genes, and low expression outer membrane prion protein (OprD) gene as important antimicrobial mechanism against Cephalosporins and Carbapenems antibiotic classes.

Keywords: Pseudomonas aeruginosa, XDR, efflux pumps genes, gene expression.

Introduction

The development of XDR Pseudomonas aeruginosa has become a genuine overall clinical issue. The decrease of medication amassing in the cytoplasm is likewise a significant system to oppose anti-microbials. There are two different ways to accomplish the reason for lessening drug collection: one is through layer impermeability, and the other is by film related siphons. The overexpression of efflux siphons was accounted for to add to multi-drug opposition in P. aeruginosa. Most Gram-negative microorganisms have the characteristics for efflux siphons having a spot with the restriction nodulation division family and a couple of homologous hindrance nodulation cell division-type siphons are delegate in P.
**aeruginosa** with the ultimate objective that MexAB-OprM (coding quality: mexA, mexB and oprM), MexCD-OprJ (mexC, mexD and oprJ), MexEF-OprN (mexE, mexF and oprN), MexXY-OprA (mexX, mexY and oprA) and some P. aeruginosa strains lost oprA quality. MexAB-OprM adds to counter-agent poison assurance from β-lactams, for instance, cephalosporines or penicillins, macrolides, chloramphenicol, anti-infection prescription and fluoroquinolones MexCD-OprJ adds to antidote poison insurance from macrolides, anti-toxin drugs, fluoroquinolones and a couple β-lactams including cefepime. MexEF-OprN adds to hostile to microbial security from fluoroquinolones, chloramphenicol and trimethoprim. MexXY-(OprA) adds to hostile to contamination insurance from aminoglycosides, cefepime, ciprofloxacin and levofloxacin. Mutational changes can cause diminished counter-agent poison take-up, alterations of against microbial targets, and overexpression of efflux siphons and hostile to contamination inactivating synthetics; all of which license minuscule living beings to make due inside seeing antimicrobial particles. For instance, an investigation by showed that inactivation of the DNA oxidative fix framework expands change frequencies in P. aeruginosa prompting upgraded β-lactamase creation and overexpression of the MexCD-OprJ efflux siphon. Unconstrained changes can influence the articulation or capacity of a particular porin, consequently diminishing bacterial layer penetrability and expanding anti-toxin opposition. Our examination was meant to measurement quality articulation of efflux siphon anti-toxin opposition gene in extensive multidrug resistance Pseudomonas aeruginosa isolates was carried out according to method described by and include the following steps:

**Total RNA extraction:** The XDR Pseudomonas aeruginosa bacterial isolates were inoculated on Luria Bertani broth and incubated at 37°C into reach bacterial cells (OD600:0.8-1.0), the bacterial cells were harvested by centrifuge at 13000rpm for 1min then, supernatant removed. Total RNA was extracted by using (easy-BLUE™ Total RNA Extraction Kit) and done according to company instructions.

**Estimation of extracted total RNA:** The extracted total RNA was checked by using Nanodrop (Thermo Scientific Nano Drop Lite UV Visible Spectrophotometer. USA) that measured RNA concentration (ng/µL) and checked the RNA purity at absorbance (260/280 nm).

**DNase I treatment:** The extracted RNA were treated with DNase I enzyme to remove the trace amounts of genomic DNA from the eluted total RNA by using samples (DNase I enzyme kit) and done according to method described by Promega company, USA instructions as following table (1).

<table>
<thead>
<tr>
<th>Mix</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total RNA 1µg</td>
<td>10µL</td>
</tr>
<tr>
<td>DNase I enzyme</td>
<td>1µL</td>
</tr>
<tr>
<td>10X buffer</td>
<td>4µL</td>
</tr>
<tr>
<td>DEPC water</td>
<td>5µL</td>
</tr>
<tr>
<td>Total</td>
<td>10µL</td>
</tr>
</tbody>
</table>

From that point onward, The blend was brooded at 37°C for 30 minutes. At that point, 1µl stop response was included and hatched at 65°C for 10 minutes for inactivation of DNase catalyst activity.

**cdDNA combination:** The DNase treated complete separated RNA tests were utilized in cdDNA combination step from mRNA records by utilizing (AccuPower® RocketScriptTM RT PreMix) and this pack was finished by organization directions as following table (2).

<table>
<thead>
<tr>
<th>RT mix</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total RNA 100µg</td>
<td>10µL</td>
</tr>
<tr>
<td>Random Hexamer primer</td>
<td>1µL</td>
</tr>
<tr>
<td>DEPC water</td>
<td>9µL</td>
</tr>
<tr>
<td>Total</td>
<td>10ul</td>
</tr>
</tbody>
</table>

**Material and Method**

**Bacterial Isolates:** A 16 XDR Pseudomonas aeruginosa isolates were provided from Microbiology laboratory in college of Medicine. These XDR isolates were previously isolated from different official hospitals includes Al-Diwaniyah teaching hospital, Diwaniyah burn center hospital, Diwaniyah Chest center hospitals, as well as from many private medical laboratory in Al-Diwaniyah city.

**Quantitative Reverse Transcription Real-Time PCR:** The quantitative Real-Time PCR technique was performed for quantification detection and gene expression analysis of antibiotics resistance efflux pumps genes and normalized by housekeeping (rpsL)
After that, these RT mix components that mentioned in table above placed in AccuPower® RocketScript™ RT PreMix kit strip tubes that containing all other components which needed to cDNA synthesis such as (Reverse Transcriptase, 5 x Reaction Buffer, DTT, dNTP, and RNase Inhibitor). Then, all the strip tubes transferred into Exispin vortex centrifuge at 3000rpm for 3 minutes, and then incubated in Thermocycler (BioRad-USA) as following thermocycler conditions protocol as showed in table (3)

### Real-Time PCR (qPCR) master mix preparation:
qPCR master mix was prepared by using (RealMODTM Green SF 2X qPCR mix Kit) based on SYBER green dye amplification in Real-Time PCR system and the qPCR master mix was prepared as following:

### Real-Time PCR primers:
Real Time PCR primers were designed in this study using NCBI-Genbank database and primer3 plus online. These primers were provided by Macrogen company from Korea as following table (4).

### Table (4): Real Time PCR primers for efflux pumps gene expression with their nucleotide sequence and product size.

<table>
<thead>
<tr>
<th>Primer</th>
<th>Sequence (5’-3’)</th>
<th>Product Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>MexA</td>
<td>TCGAATTCTCCGAGGTTTCCG</td>
<td>142bp</td>
</tr>
<tr>
<td></td>
<td>AGGATGGCCCTTCTGCTTGAC</td>
<td></td>
</tr>
<tr>
<td>MexC</td>
<td>TGGCTGATTTGCGTGCAATAG</td>
<td>115bp</td>
</tr>
<tr>
<td></td>
<td>TCCACCGGCAACACCATTC</td>
<td></td>
</tr>
<tr>
<td>MexE</td>
<td>TGGAAACAGTCATCCCCACTTCTC</td>
<td>145bp</td>
</tr>
<tr>
<td></td>
<td>AGCGGTGGTTCGATGACTTC</td>
<td></td>
</tr>
<tr>
<td>MexY</td>
<td>GTCGTTGAAAGGCCGTTTACC</td>
<td>122bp</td>
</tr>
<tr>
<td></td>
<td>TGTGAAACAGACGCACGAG</td>
<td></td>
</tr>
<tr>
<td>MexB</td>
<td>CGTCAAGCAATTGCCGAAAG</td>
<td>150bp</td>
</tr>
<tr>
<td></td>
<td>ATCGACCAGCTTCTCGATAGG</td>
<td></td>
</tr>
<tr>
<td>AmpC</td>
<td>ATGCCGCGATACCATCCC</td>
<td>146bp</td>
</tr>
<tr>
<td></td>
<td>TTGCGCTTTCATACGGGTTG</td>
<td></td>
</tr>
<tr>
<td>OprD</td>
<td>AAGAGCGCGGATTTCATG</td>
<td>125bp</td>
</tr>
<tr>
<td></td>
<td>AGTGGGAAGGTGATAGTTCTG</td>
<td></td>
</tr>
<tr>
<td>Housekeeping gene rpsL</td>
<td>TATGCACCGCGTATACACC</td>
<td>93bp</td>
</tr>
<tr>
<td></td>
<td>AAACCTGAAACCGTGTTTCG</td>
<td></td>
</tr>
</tbody>
</table>

### Standard Curve qPCR master mix:
qPCR standard curve was performed to evaluate the qPCR efficiency by Real-Time PCR amplification and prepared by using DNA Copy number calculator, online to calculate \((1 \times 10^8)\) DNA copy number Pseudomonas aeruginosa, then used for prepared 10 fold dilution as \((1 \times 10^8, 1 \times 10^7, 1 \times 10^6, 1 \times 10^5, 1 \times 10^4, 1 \times 10^3, 1 \times 10^2, 1 \times 10^1)\) that used in qPCR master mix as following table (5).

### Table (5): qPCR standard curve master mix protocol

<table>
<thead>
<tr>
<th>qPCR master mix</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 fold dilution (10ng)</td>
<td>5 µL</td>
</tr>
<tr>
<td>DNA template</td>
<td></td>
</tr>
<tr>
<td>rpsL Forward primer(10pmol)</td>
<td>1 µL</td>
</tr>
<tr>
<td>rpsL Reverse primer (10pmol)</td>
<td>1 µL</td>
</tr>
<tr>
<td>qPCR Master Mix</td>
<td>10 µL</td>
</tr>
<tr>
<td>Nuclease free water</td>
<td>3 µL</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>20 µL</td>
</tr>
</tbody>
</table>
Data analysis of qPCR: The data results of qPCR for target and housekeeping gene were used expression analysis (fold change) used (The ΔCT Method Using a reference gene) that described by\(^9\) as following equation:

\[
\text{Ratio (reference/target)} = 2^{\Delta CT(\text{reference}) - \Delta CT(\text{target})}
\]

Statistics Analysis: The statistical analysis was done by using LSD test, one way anova at P value < 0.05 were performed by using GraphPad Prism 7 Statistics software.

Results and Discussion

The converse record Continuous PCR (RT-qPCR) was performed for sub-atomic recognition and evaluation of quality articulation levels for efflux siphon anti-toxin obstruction quality (mexA, mexB, mexC, mexE, and mexY) and chromosomal lactamase (AmpC) quality, just as external layer prion protein (OprD) quality in broad medication pseudomonas aeruginosa separates. The relative articulation investigation was finished by utilized the 2-ΔΔCT (Livak) strategy, this technique was utilized for standardization of articulation levels (mRNA record levels) in target qualities with appropriate housekeeping quality. In this investigation 30S ribosomal protein S12 (rrpL) housekeeping quality was utilized in standardization of anti-toxin obstruction qualities articulation levels in broad medication pseudomonas aeruginosa detaches as appeared in figure (3). The constant PCR productively was dictated by utilizing genomic DNA standard bend and the qPCR intensification plot results for three 10 overlay weakened DNA (1x102, 1x104, 1x106, and 1x108/duplicate number) with RT-PCR effectiveness (100%) were appeared in figure (1) & (2).

![Figure (1): Real-Time PCR amplification plot of 10 fold diluted DNA template.](image1)

![Figure (2): Ongoing PCR standard bend of 10 overlay weakened DNA format with qPCR proficiency (100%).](image2)
Figure (3): Constant PCR intensification plot of 30S ribosomal protein S12 (rpsL) housekeeping quality, that indicated no huge contrast in edge cycle numbers between broad medication pseudomonas aeruginosa disengages ran (26.63-53) CT number.

The relative quality articulation investigation were demonstrated most elevated recurrence of overexpression as appeared in table (6):

Table (6): Livak technique for Relative quality articulation investigation in XDR Pseudomonas aeruginosa disengages.

<table>
<thead>
<tr>
<th>Gene</th>
<th>qPCR detection (%)</th>
<th>Fold change ($2^{-\Delta\Delta CT}$)</th>
<th>Over expression (%)</th>
<th>Down expression (%)</th>
<th>No Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AmpC</td>
<td>100%</td>
<td>6.77-73.1</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>mexA</td>
<td>87.50%</td>
<td>2.16-121.10</td>
<td>87.50%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>mexB</td>
<td>100%</td>
<td>15.24-148.06</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>mexC</td>
<td>81.25%</td>
<td>2.79-184.82</td>
<td>81.25%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>mexE</td>
<td>100%</td>
<td>16.11-123.65</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>mexY</td>
<td>56.25%</td>
<td>3.97-20.11</td>
<td>56.25%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>OprD</td>
<td>68.75%</td>
<td>0.01-0.16</td>
<td>0%</td>
<td>68.75%</td>
<td>0%</td>
</tr>
</tbody>
</table>

The mean of overlap change quality articulation investigation in of efflux siphon anti-infection obstruction qualities in XDR Pseudomonas aeruginosa disengages as appeared in figure (4):

Figure (4): The mean of overlap change quality articulation investigation in of efflux siphon anti-toxin opposition qualities in XDR Pseudomonas aeruginosa detaches.
The present study was showed that all XDR Pseudomonas aeruginosa isolates has significantly increased overexpression production of inducible chromosomal lactamase AmpC gene expression at (100%) and their relative expression ratio ranged (6.77-73.1) fold change compared to wild type PA control. This finding explains that overexpression of chromosomal AmpC (ampC) is mainly responsible for upregulation to resistance mechanism to penicillin and cephalosporinase β-lactams class as showed in our results for antibiotic susceptible pattern that (XDR) Pseudomonas aeruginosa isolates are resistance to cephalosporins. Study by[10] who finding that mutation-dependent overproduction of intrinsic β-lactamase AmpC is considered the main cause of resistance of clinical strains of Pseudomonas aeruginosa to antipseudomonal penicillins and cephalosporins and these finding consistent with our results that exhibiting a greater resistance to ceftazidime and Cefepime as well as Piperacillin antibiotics. Another study in France showed increased resistance to ceftazidime among the clinical isolates of P. aeruginosa it primarily because of AmpC over-expression[11]. The present study was showed the relative gene expression analysis were showed highest frequency of overexpression at (100%, 100%, 87.5%, 81.25%, 56.25%) for (mexB, mexE, mexA, mexC, and mexY) with fold change ranged (2.16-184.82) fold change compared to wild type PA control isolate and all the XDR isolates were produced overexpression at relatively variable expression levels, it may be resulting from single mutation in efflux pump antibiotic resistance genes that effect on expression regulatory mechanisms. This suggestion consistence with previously observed results in the P. aeruginosa clinical isolates [12]. Who finding that overexpression of the two efflux systems may result from mutations affecting multiple regulatory genes. The expression of AmpC is significantly increased, P. aeruginosa is resistant to almost all classes of β-lactams, except the carbapenems[13]. Finally, our study was concluded that Pseudomonas aeruginosa is important causes of nosocomial diseases and has high ability to acquired multidrugs resistance capacity especially in burn infection patients, XDR Pseudomonas aeruginosa isolates can ability to overexpression production of inducible chromosomal lactamase AmpC gene, efflux pumps protein genes, and low expression outer membrane prion protein (OprD) gene as important antimicrobial mechanism against Cephalosporins and Carbapenems antibiotic classes.

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Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Medicine and all experiments were carried out in accordance with approved guidelines.

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Principles of Humanitarian Law in the War Biography of Imam Ali (Peace be upon Him) the Equestrian Principle and Proportionality as a Model

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Abstract

The biography of Imam Ali included the most human principles and rules, and his war biography was a mixture of justice, fairness and mercy. This brief study reached several results, which we summarize as follows: The Imam hated war and pushed it as long as he found a way to do that. The basic principle for him is the state of peace, and war is an exceptional and urgent case, and all his wars were self-defence, a response to aggression and the payment of sedition and corruption. The Imam prevailed in his battles against humanism over the necessities and requirements of war, so love, peace, compassion and mercy were the basis of his personality, and his perseverance was forgiveness and tolerance, even if that led to the loss of victory, as happened in the incident of the law of water in the battle of ((Safin)). The principle of chivalry was evident in its most beautiful form in the personality of the Imam, with the qualities of honesty, courage and arrogance he carried.

Keywords: Humanitarian law, biography of Imam Ali, Proportionality as a Model.

Introduction

The personality of Imam Ali (peace be upon him) is distinguished by its many dimensions and its intellectual, scientific, spiritual and literary aspects... and each dimension has its great human value and value, and among those bright dimensions is its humanity in war and his unique horsemanship with the values of nobility, magnanimity, fairness and mercy of enemies. His military career included many humanitarian principles, what he calls - today - international humanitarian law. The importance of the research stems from the fact that it deals with a modern vital topic that has little experience, especially since the issues of humanitarian law are among the studies developed in our universities.

Research reasons and objectives:

1. The research aims to show the greatness of Islam and its human and moral civilization, by reviewing some of the positions of Imam Ali (PBUH) - in word and deed - in war and what is related to its affairs, as his war history represents in that the true approach of Islam.

2. On the occasion of the passage of one thousand four hundred Hijri years since the martyrdom of the Imam (PBUH), the University of Kufa decided to consider this year - 1440 AH - as its own and direct its professors to show some aspects of this great personality.

3. Many subjective reasons, including familiarity with and depth of most issues of humanitarian law and the diversification of our legal research.

The research problem: It is represented in knowing the extent to which Imam Ali’s war biography includes the most important principles of humanitarian law and their application before their appearance in Western civilization.

Methodology

We followed the descriptive historical method, the legal analysis method, as well as the comparative approach.

Search Plan:

For the sake of brevity, we will address the topic in two main points:
**First:** Humanism in the military biography of Imam Ali.

**Second:** The principles of chivalry and proportionality.

The conclusion comes with the summary, results and recommendations it contained, and then the approved sources.

**First: the humanism in the military biography of Imam Ali**

The military biography of Imam Ali consists of two stages:

1. **The First:** During the era of the Messenger (PBUH) -1-11 AH- in which the Imam was a military commander in what is used - today - in military terms ((Chief of Staff of War)), and at this stage, he participated in all the major wars of Islam led by the Messenger (p.) Himself, as the Messenger sent him during this period as commander of several companies - Khaybar - Fadak - Yemen, and others.

2. **The Second:** The days of his caliphate 35-40 AH - and in it, he was the political leader of the nation and the supreme commander-in-chief of the armies of the Islamic state, and in which he led the major internal wars himself - Al-Jamal-Siffin-Al-Nahrawan.

In both phases, his military practices manifested the humanism that is the model for noble warriors, bypassing the requirements and necessities of war. The war did not have a means of extending influence and control, nor did it aim to heal and retaliate or exterminate the opponent, and he only fought it in defence of freedom of belief and the security of the state and society.

The evidence for this in his war biography are many, including that he did not invite anyone to fight him, and if he was invited he answered, thus recommending his son Al-Hassan: ((Do not call for a duel, and if you are called, then he will answer, for the caller is absent and the perpetrator is killed))\(^1\). Bin Wad in the battle of the Trench is what confirms this. Before confronting him, Islam offered him or return and peace \(^2\), and if he met the two armies he would not authorize the fighting until he offered peace and return to the enemies and frightened them with the consequences of the war, and he invoked his words: ((Oh God, inject our blood and their blood and reform the self) Between us and them, and save them from their misguidance so that the truth is known from his ignorance, and he feeds on the treachery and treachery of his accusers))\(^3\).

This is what happened in the Battle of the Camel. After the leaders of the other side responded to his envoys and did not heed his advice, he remained until the last moment, appealing to them and inviting them to peace, and one of his companions sent them with the Qur’an in hand to offer them his arbitration and they killed him, and then they attacked his army, so he said: ((Oh God, bear witness ...)).\(^4\) He had no choice but to defend himself and repel aggression.

Thus he did with Muawiyah and the people of Levant before the battle of ((Safin)), as they were guided by the month of Muharram from the year -37 AH- so that they might respond to the call of reason and humanity. God Almighty, by calling you to him, you did not refrain from tyranny, and you did not answer to the truth, and I rejected you the same because God does not love the traitors))\(^5\), and he used to recommend his soldiers before meeting the enemy in two ranks by his famous saying: ((Do not fight them until they start you, for you Praise be to God for proof, and he left you until they start another argument for you on them)).\(^6\)

And this is how his position was with the internal opposition - the outside - where he dealt with them with unprecedented humanity, for after they broke with his rule and opposing him, he did not imprison them or restrict them, nor did he exclude them from participating in political life, and they would attend the mosque with him, discuss it and pray alone, and he protested them several times and obeyed He had many of them, and decided to deal with them by saying: ((You have three times with us, we do not prevent you from praying in this mosque, and we do not prevent you from your share in this category - what your hands were with ours - and we do not fight you until you fight us))\(^7\) And when they announce the disobedience and rebel Corruption on the ground and they killed the Muslims, who wrote them and warned them against the consequences of war and preached them, and when the battle took place on them he raised a flag of safety for them, as he allowed those who wanted to leave the war to leave, and healed their wounded \(^8\)

Upon studying his war behaviour, we see that his war was not an unrestrained war with no boundaries, but rather disciplined and moderate, in which he refrained from using harsh or hideous method and means under
any circumstance or name - such as the necessities of war or reciprocity, and his war behaviours stemmed from an innate and moral human capacity. Sublime, his actions and war stances were validation of what (Grosius) looked to him after ten centuries defending the controls of moderation in war.

Among these behaviours was the incident of the Sharia of water in the Battle of Siffin, where Muawiya’s army took control of it first, and they decided to put the Imam and his army to death by thirst. And his leaders were to prevent Muawiya’s army from it and exterminate them thirst, or they surrendered to a reciprocal treatment, so the imam refused that and left between them and the water and said to his commanders: (Indeed, God has given you victory over them by their injustice and their intent ... and all water is in it).

This is the core and essence of humanitarian law and its goal that it seeks to achieve.

Second: The principle of chivalry and proportionality of Imam Ali: Humanitarian law is based on a set of basic principles whose origins are traced back to humanitarian, religious and ethical sources. They existed before the emergence of the law and governed after its codification. The conventions may explicitly mention them in the preamble or the context with the expression ((laws of humanity)) or ((the prevailing custom)) or ((What is dictated by the general conscience)), and it applies to all times and places, and we will deal with it in this point two basic principles, as follows:

1. The Equestrian Principle: It is an ancient principle known to most nations, including the Arabs, and emerged in the Middle Ages among the Romans and Franks after they converted to Christianity, and the principle is the qualities of heroism and nobility in a knight or a fighter, which necessitate refraining from treachery, treachery, deception, or the use of excessive force and brutality or prohibited weapons, and all that it would avert honour, and the principle also requires not to finish off a wounded, unarmed or prisoner, or attack civilians and loot their property, and among the equestrian rules is reciprocity, and unfortunately, previously Christian countries did not apply them to non-Christians, especially in their Crusades against Muslims, which were committed. It contained the most heinous human crimes until it came to decorating some churches with the bones of Muslims.

The principle contributed to alleviating the pain of war and sparing non-combatants from its woes.

It is not an exaggeration to say: The most perfect validation of the principle is the person of the Imam, because of the qualities and morals of the knights he possessed, and in that he says - Carlyle -: ((As for that boy Ali you cannot help but love him, God has installed nobility in his character since modernity, In its shade, generosity was manifested throughout his life, and then it was imprinted on work, impassion and frankness of strength, and the mystery of chivalry and the boldness of the Layth came to him, and all of this was in the tenderness of the heart, sincerity of faith, and effective generosity worthy of Christian chivalry)).

It is not mentioned in its history that he betrayed a covenant or betrayed anyone, who said: ((Loyalty is the twin of sincerity, and I do not know a better paradise than it ... We have become in a time when most of his people have taken treachery and attributed them to the people of ignorance in it to good resourcefulness ..., he may see the change. The heart is the face of the trick, and without it is an objection to the command of God and forbids it, so it allows it to see the eye after being able to it, and it takes its opportunity for the one who does not need religion)).

And he confirmed this in his covenant to the owner of Ashtar - when the ruler of Egypt - saying: ((If you made a knot between you and your enemy or clothe him from you, then make your pledge to honour your commitment and make yourself a paradise as you were given ... so do not betray your responsibility and do not betray your pledge ...)).

He also did not mention in his fights and wars - despite their many - that he killed someone from behind or killed a wounded person. Rather, in his wars, he used to repeat his commandment to his commanders and companions that: ((... do not kill a mastermind, and do not prepare against a wounded ...)) Historians have mentioned His duel in ((Battle of Uhud)) for one of the leaders of the great polytheists - Talha bin Othman - where he called for the duel, so the imam went out to him, cut his leg and left it. The imam was told:

((Could I be ready for him, so he said: God and the Womb have appealed to me, and I have stopped him)), and this is the core of the equestrian principle.

2. The principle of proportionality: It is an ancient principle that emerged under the principle of
chivalry and was established after the spread of Christianity, and it is a compromise principle that seeks to establish a balance between two opposing interests, the first being the war imperatives, which allows the use of violent method and means of combat to defeat the enemy and achieve victory - even if that leads to excruciating pain. And heavy losses among combatants, and even civilians, who are covered by special protection, while the other interest is represented by humanitarian requirements and considerations, which prohibit the use of unfamiliar or brutal method and means of combat and prevent excessive injuries, and call for civilians and those covered by special protection, such as the wounded and sick, to be spared the scourge and pain of war.

**Conclusion**

The biography of Imam Ali included the most human principles and rules, and his war biography was a mixture of justice, fairness and mercy. This brief study reached several results, which we summarize as follows: The Imam hated war and pushed it as long as he found a way to do that. The basic principle for him is the state of peace, and war is an exceptional and urgent case, and all his wars were self-defence, a response to aggression and the payment of sedition and corruption. The Imam prevailed in his battles against humanism over the necessities and requirements of war, so love, peace, compassion and mercy were the basis of his personality, and his perseverance was forgiveness and tolerance, even if that led to the loss of victory, as happened in the incident of the law of water in the battle of ((Safin)). The principle of chivalry was evident in its most beautiful form in the personality of the Imam, with the qualities of honesty, courage and arrogance he carried. The Imam applied the principle of proportionality in his wars, so he did not use unfamiliar and despicable method of brutal weapons, such as killing the enemy at night or using poisonous weapons, and he did not go too far in killing or eradicating enemies, and he was content with achieving victory on the battlefield, and this is the essence of proportionality. The significance of what was stated in the proclamation of Saint Peter Burg - 1168.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the University of Kufaan and all experiments were carried out in accordance with approved guidelines.

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Assessment of Mothers’ Knowledge toward Cesarean Section Complications at the Hospitals in Baghdad City Hospitals

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²Assistant Lecturer, Collage of Nursing-Al-Bayan University

Abstract

Background: Cesarean section is one of the most frequently performed major abdominal surgeries and carries the risk of infection, including local wounds, pelvic, respiratory tract, and urinary tract infections, as well as lung emboli, venous thrombosis, and complications of anesthesia.

Objective: The study aimed to assess mothers’ knowledge toward complications of cesarean section and to find out the relationship between mothers’ knowledge and their demographic characteristics such as (age, level of education, and multipara cesarean section).

Methodology: A descriptive (cross-section) study design was conducted on (100) mothers with cesarean section in the maternal ward. (The data were collected by the investigator, fill the questionnaire formats by interview technique and fill it by the investigator). Questionnaire form was constructed for the purpose of the study. It consists of two parts which were dealing with the demographic characteristics of mothers and the mothers’ knowledge towards cesarean section complications. The data collection reliability of the questionnaire was determined through internal consistency. Content validity of the questionnaire was determined through panel of experts. Data were analyzed through descriptive and statistical approach (frequency and percentage, and chi-square) by Socioeconomic Package for Social Science approach Version 16.

Results: The finding of the study demonstrated one result about the knowledge of mothers there was accepted statistical percentage between mothers’ knowledge and their demographic characteristics such as (age, level of education, and multipara cesarean section).

Keywords: Assessment, Cesarean Section, Complications, Hospitals.

Introduction

Cesarean section (CS) is one of the most frequently performed major abdominal surgeries. Despite a lack of upsurge in obstetric emergencies, the rate of CS has increased in many parts of the world, reaching higher than 50% in some countries.¹⁻³ Most of these CS surgeries are performed without any medical indication and some are cesarean delivery on mother’s request (CDMR).⁴ The world incidence of CDMR is estimated to be 8–14% of all cesarean deliveries.⁵ In order to prevent the dangers of vaginal delivery, the idea of elective CS in full-term pregnancy attracted the media’s attention about 20 years ago.⁶ Since then, there have been serious discussions about performing CDMR in full-term pregnancies.⁷ Although recent studies have shown that the risk of planned CS and planned vaginal delivery in the short term are low and similar, in subsequent pregnancies, the risk will be higher in a mother who has had a previous CS.⁸⁻¹⁰ Like other surgical operations, CS carries the risk of infection, including local wounds, pelvic, respiratory tract, and urinary tract infections, as well as lung emboli, venous thrombosis, and complications of anesthesia. Thus morbidity and mortality rates are higher in CS compared to normal vaginal delivery (NVD) in both mother and child.¹¹ In addition, studies show that financial burden of repeated CS, including duration of hospitalization, drugs used, and their complications, are significantly greater as...
compared to NVD. Other complications of CS are the increased risk of placental adherence and uterine rupture in subsequent pregnancies, intensive care admission, hysterectomy, problems with subsequent fertility (e.g., reduced fertility, ectopic pregnancy, miscarriage), and increased risks of fetal and neonatal mortality.

**Methodology**

Descriptive study design was conducted on (100) mothers having multipara delivery, data collection started from 20\(^{th}\) February 2016 to 20\(^{th}\) April 2016 achieve the objectives of the study. The study was carried out by Baghdad Teaching Hospital at medical city and Mohammed Bakeer Al- Hakeem Teaching Hospital. Non-probability (purposive) sample of (100) mothers multipara cesarean section. The questionnaire was designed and constructed by the investigator to measure the variable underlying the study. A questionnaire was consisted of two parts : (1) demographical information includes items such as (mothers’ age, mothers’ multipara cesarean deliveries) and the complications effects on the mothers. The second part it comprised of structured (16) items concerning mothers’ knowledge toward complications of cesarean section on her health. Items related to the knowledge of sample under study rated according to 3 points rating scale (I know, uncertain and don’t know) data were collected through the use of questionnaire format and, means of an interview with mothers who have multipara cesarean section in maternity ward. A pilot studies was conducted on (10) mothers who have mulipara cesarean section selected from Nurse Home Hospital at 15 February 2016, and the result by Split Half : (r = 0.80). Data analyzed through the application of statistical procedure which may assist for the determination of the study finding.

**Results**

**Fig. 1** Association between Maltipara Caesarian Section of the Study Sample and their Age

![Bar Chart](#)
Figure (2): Association between Multipara Cesarean Section of the Study Sample and their Educational Level

Table (1): Distribution of Study Sample General Information

<table>
<thead>
<tr>
<th>No.</th>
<th>Variables</th>
<th>*F.</th>
<th>***%</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-</td>
<td>Mothers’ Age Group</td>
<td></td>
<td></td>
<td>100(100%)</td>
</tr>
<tr>
<td>1-1</td>
<td>Less than 20 years</td>
<td>12</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>1-2</td>
<td>20-29 years old</td>
<td>45</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>1-3</td>
<td>30-39 years old</td>
<td>36</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>1-4</td>
<td>40 and above years old</td>
<td>7</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>2-</td>
<td>Mothers’ Educational Level</td>
<td></td>
<td></td>
<td>Total</td>
</tr>
<tr>
<td>2-1</td>
<td>No Read and no Write</td>
<td>5</td>
<td>5</td>
<td>100(100%)</td>
</tr>
<tr>
<td>2-2</td>
<td>Primary Level</td>
<td>21</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>2-3</td>
<td>Elementary Level</td>
<td>18</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>2-4</td>
<td>Secondary Level</td>
<td>32</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>2-5</td>
<td>Instituted Level</td>
<td>11</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>2-6</td>
<td>Collage and Postgraduate Level</td>
<td>13</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>3-</td>
<td>Mothers’ Multipara Cesarean Section</td>
<td></td>
<td></td>
<td>Total</td>
</tr>
<tr>
<td>3-1</td>
<td>2-3 times of Caesarian Section</td>
<td>53</td>
<td>53</td>
<td>100(100%)</td>
</tr>
<tr>
<td>3-2</td>
<td>4- and above times of Caesarian Section</td>
<td>47</td>
<td>47</td>
<td></td>
</tr>
</tbody>
</table>

*F. = Frequency, ***% = Percent
This table shows that more than one third percent (45%) at mothers’ age group (20-29 years old), while one third percent (32%) for secondary level of education, and more than half percent of the study sample (53%) have (2-3) times cesarean section.

**Table (2) Distribution of the Mothers’ Knowledge toward Complications of Cesarean Section**

<table>
<thead>
<tr>
<th>No.</th>
<th>Complication Effect on Mothers’ Health</th>
<th>I Know</th>
<th>Uncertain</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>*F.</td>
<td>***%</td>
<td>*F.</td>
</tr>
<tr>
<td>1</td>
<td>Delayed healing wound after the operation</td>
<td>89</td>
<td>89</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>Early bleeding after the operation (1 day -14 days)</td>
<td>53</td>
<td>53</td>
<td>28</td>
</tr>
<tr>
<td>3</td>
<td>Late bleeding after the operation (15 day - 40 days)</td>
<td>21</td>
<td>21</td>
<td>32</td>
</tr>
<tr>
<td>4</td>
<td>Bladder puncture during operation</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>Respiratory tract infection as a result of anesthesia</td>
<td>32</td>
<td>32</td>
<td>29</td>
</tr>
<tr>
<td>6</td>
<td>Weakness of a bowel movement after delivery</td>
<td>48</td>
<td>48</td>
<td>28</td>
</tr>
<tr>
<td>7</td>
<td>Obesity and bulge the mother’s abdomen</td>
<td>61</td>
<td>61</td>
<td>24</td>
</tr>
<tr>
<td>8</td>
<td>Urinary tract infection</td>
<td>63</td>
<td>63</td>
<td>12</td>
</tr>
<tr>
<td>9</td>
<td>Blood clots finally lead to death</td>
<td>30</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>10</td>
<td>Laceration of the uterus wall</td>
<td>12</td>
<td>12</td>
<td>27</td>
</tr>
<tr>
<td>11</td>
<td>Placenta progressing in the next pregnant</td>
<td>15</td>
<td>15</td>
<td>21</td>
</tr>
<tr>
<td>12</td>
<td>Placenta permeation in the next pregnant</td>
<td>15</td>
<td>15</td>
<td>21</td>
</tr>
<tr>
<td>13</td>
<td>Hysterectomy related to Placenta permeation</td>
<td>13</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>14</td>
<td>Uterus explosion in the next deliveries</td>
<td>27</td>
<td>27</td>
<td>29</td>
</tr>
</tbody>
</table>

*F. = Frequency, ***% = Percent

This table shows that most of the mothers were knowledgeable (89%) about delayed healing wound after operation, more than half of them (53%) knowing about bleeding after the operation, more than one third (48%) weakness of bowel movement after delivery, more than one half (61%, and 63%) about obesity and bulge their abdomen, and about urinary tract infection. While in regard to other items mother have no information about them.

**Table (3) Association between Mothers’ Knowledge toward Complications of Cesarean Section and their Age**

<table>
<thead>
<tr>
<th>No.</th>
<th>Mothers’ Knowledge toward Complications of Cesarean Section</th>
<th>Mothers’ Age Groups</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Less than 20</td>
<td>20-29</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I Know</td>
<td>Uncertain</td>
</tr>
<tr>
<td>1</td>
<td>Delayed healing wound after the operation</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Early bleeding after the operation (1 day -14 days)</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Late bleeding after the operation (15 day-40 days)</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Bladder puncture during operation</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Respiratory tract infection as a result of anesthesia</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>
### Mothers' Knowledge toward Complications of Cesarean Section

<table>
<thead>
<tr>
<th>No.</th>
<th>Complication</th>
<th>Mothers’ Age Groups</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Less than 20</td>
<td>20-29</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I Know</td>
<td>Uncertain</td>
</tr>
<tr>
<td>6</td>
<td>Weakness of a bowel movement after delivery</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Obesity and bulge the mother’s abdomen</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>Urinary tract infection</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Clotting blood in lungs, and Legs.</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>Blood clots finally lead to death</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>Inflammation of the uterus lining</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>Laceration of the uterus wall</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>13</td>
<td>Placenta progressing in the next pregnant</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>Placenta permeation in the next pregnant</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>15</td>
<td>Hysterectomy related to Placenta permeation</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>16</td>
<td>Uterus explosion in the next deliveries</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

*p-value ≤ 0.05 the significant

This table shown that laceration of the uterus wall, uterus explosion in the next deliveries, have highly significant association with the study sample age group, while the other items and the total knowledge have non-significant. Less than one third (30%) has information about complications of Cesarean section at age (20-29 years old).
Table (4) Association between Mothers’ Knowledge toward Complications of Cesarean Section and their Level of Education

<table>
<thead>
<tr>
<th>No.</th>
<th>Mothers’ Knowledge toward Complications of Cesarean Section</th>
<th>Mothers’ Level of Education</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Read no Write</td>
<td>1 Know</td>
<td>Uncertain</td>
</tr>
<tr>
<td>1</td>
<td>Delayed healing wound after the operation</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Early bleeding after the operation (1 day -14 days)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Late bleeding after the operation (15 day-40 days)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Bladder puncture during operation</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>Respiratory tract infection as a result of anesthesia</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Weakness of a bowel movement after delivery</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>Obesity and bulge the mother’s abdomen</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Urinary tract infection</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>Clotting blood in lungs, and Legs.</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>Blood clots finally lead to death</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>Inflammation of the uterus lining</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Laceration of the uterus wall</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>13</td>
<td>Placenta progressing in the next pregnant</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>Placenta accreta in the next pregnant</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>Hysterectomy related to Placenta accreta</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>Uterus explosion in the next deliveries</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

This table shown that the association between mothers’ knowledge and their level of education have significant for the items: bladder puncture during operation, respiratory tract infection as a result of anesthesia, placenta permeation in the next pregnant, and hysterectomy related to placenta permeation, while the other items and total of it have no significant association.

Table (5) the Association between Mothers’ Knowledge toward Complications of Cesarean Section on her and their Multipara of Cesarean Section

<table>
<thead>
<tr>
<th>No.</th>
<th>Mothers’ Knowledge toward Complications of Cesarean Section</th>
<th>Mothers’ Multipara of Cesarean Section</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Read no Write</td>
<td>1 Know</td>
<td>Uncertain</td>
</tr>
<tr>
<td>1</td>
<td>Delayed healing wound after the operation</td>
<td>49</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Early bleeding after the operation (1 day -14 days)</td>
<td>22</td>
<td>15</td>
</tr>
</tbody>
</table>

This table shown that the association between mothers’ knowledge and their level of education have significant for the items: bladder puncture during operation, respiratory tract infection as a result of anesthesia, placenta permeation in the next pregnant, and hysterectomy related to placenta permeation, while the other items and total of it have no significant association.
This table shown that the association between mothers’ knowledge and their multipara cesarean section has significant with Inflammation of the uterus lining, while the other items and the total have no significant association.

**Discussion of the Results**

In figure (1) twenty seven percent (27%) (2-3 times) of multipara cesarean section mothers were at age (20-29) years old and twenty three percent (23%) of them also have (4 and above) multipara cesarean section at age (30-39) years old this results agreed with the study by Ahmad study(14) reported that thirty seven percent (37%) of multipara was within age group of (21-25) years with a mean of 27.6.0, while nearly one third (32%) of grandmultipara was within age group 36-40 years with a mean of 33.2. Also(15) reported that the average age of the study group was 25.1 years, which was a suitable age for reproduction. Simonsin study(16) reported that numerous obstetrics complications have been independently associated with progressive maternal age. In addition, older women with 5 or more babies known as risk group. (17) Daniel and Seidman(18) considered the age factors that increase the hazards of high parity, so the grandmultipara is an older woman and suffers those disabilities which accompany age; especially her cardiovascular system is less resilient so that hypertensive disease is more manifest. The risks of teenage pregnancy are well known, but these account for a relatively small proportion of pregnancies in most countries. In contrast, the proportion of pregnancies in women aged 35 and older are higher and are rising in many countries. The proportions of older mother are rising in many countries ranged from a low of 7.5 in Slovakia to a high of 24.3 in Ireland.(19) Older mothers have a higher prevalence of pregnancy complications, including some congenital anomalies, hypertension, and diabetes. Older maternal ages is significant risk factor for maternal mortality and morbidity, are more delivered by C/S. and have more low birth weights, which will thus cause higher rates of fetal and infant death.(20)

*Educational level* concerning poor educational status of women largely contributes to multipara cesarean section (MCS) and its complications, and prevents
them to take benefit from available facilities. That is why MCS is more common in lower socioeconomic group.(21) The educational level for most mothers in both groups (2-3, and 4-and above) times (MCS) was limited (secondary and primary educational level graduate) as shown in figure (2). This result agrees with Ahmed and Roman et al.14 and 22 studies who stated in their study that concerning obstetric and neonatal outcomes in grand multiparity that grand multipara was in lower level of education, and consistent with Begum study(23) who reported that the level of education status almost poor in grand multiparous women. Mothers of poor level of education often face the following consequences: social isolation, poor life habits, low education level, maltreatment, stress, and depression, in addition young mothers are at greater risk of leaving school or attaining a lower level of education.(24) Educational level is well correlated with perinatal outcome.(20)

The results indicated that more than two third of mothers (89%) have information about delayed healing wound after operation and more than half (53%) knowing about bleeding after the operation, more than one third (48%) weakness of bowel movement after delivery, more than one half (61%, and 63%) about obesity and bulge their abdomen, and knowing about urinary tract infection after cesarean section and this results agree with Ghasvari, et al. study(25) indicate mothers have good and moderate knowledge about maternally complication for elective and emergency cesarean section.

In table (3) shows that no significant association between maternal knowledge and their age groups, and its agree with Ghasvari and et al. study(25).

In regard to their Educational Level study by Ghasvari and et al.25 reported that have (35.5% and 41.8%) good and moderate knowledge level about cesarean section at under diploma mothers educational level and its agree with the present study in tables (4), while the association between mothers’ knowledge and their level of education have significant for the items: bladder puncture during operation, respiratory tract infection as a result of anesthesia, placenta accreta in the next pregnant, and hysterectomy related to placenta accreta only.

Related to their multipara cesarean section the present study table (5) shown that the association between mothers’ knowledge and their multipara cesarean section has significant with Inflammation of the uterus lining item only and the other items and totally knowledge items has no significant and it’s agree with Ghasvariand et al.25 reported that have (33.9% and 43.5%) good and moderate level of knowledge.

### Conclusion

Most of the study samples have multipara cesarean section at age above thirty years old; means the previous twenty years increase number of cesarean section instead of normal vaginal delivery. Most of them have low educational level lead to poor information about the risk of cesarean section and chose easily kind of delivery with no difficulty pain.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Al-Bayan University and all experiments were carried out in accordance with approved guidelines.

### References

Value of the Perineal Ultrasound in the Diagnosis of Anterior Urethral Stricture in Male Patient

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Abstract

Objectives: Determine the role of perineal ultrasound in the diagnosis of anterior urethral strictures and assessment of peristenotic fibrosis.

Material and Method: Thirty healthy adult male and thirty patients with suspected urethral stricture have had urethral ultrasound after distension of urethra with a normal saline. The thirty patients also underwent retrograde urethrogram (RUG).

Results: Average diameters healthy urethra were 11.6 +/- 3.1 mm at penile level, 11.2 +/- 2.7 mm at the bulbous level, and 9.7 +/- 2.8 mm at the bulbomembranous level. The periurethral tissue thickness averaged 2.7 +/- 0.5 mm at penile level, from 3.5 +/- 0.65 mm to bulbous level and 3.8±0.6 mm at the bulbomembranous level. Ultrasound made the diagnosis of 31 stenosis or 96.87%. On ultrasound, the length of the stenosis was significantly longer than that seen on retrograde urethrogram with a significant difference between the two techniques (P = 0.045). There is also a significant difference in diameter of urethral strictures between the two techniques. The thickness of the periurethral tissue at the level urethral stenosis was more than that measured in a healthy zone in all cases, whatever the urethral portion concerned. There was not no correlation between periurethral tissue thickness and degree of stenosis.

Conclusion: Urethral ultrasound is a method that allows us to make the diagnosis of urethral stricture and to assess periurethral fibrosis. It could validly replace retrograde urethrogram in diagnosing anterior urethral stricture.

Keywords: Perineal ultrasonography. Urethral stricture. Retrograde urethrogram.

Introduction

Urethral stenosis is the decrease of the caliber of the urethra, causing a resistance to the antigrade flow of urine¹. Stricture of male anterior urethra is a common pathology and may be congenital or acquired in origin². It has a therapeutic problem which is the risk of recurrence related to the development of a peristenotic fibrosis in the spongy tissue³. A precise therapeutic preassessment taking into account the characters of the urethral stenosis and peristenotic tissue appears so indispensable³. The usual investigation of diagnosing urethral stricture were based on retrograde urethrogram which have limits in evaluation of the exact length of the urethral stricture and they cannot appreciate the associated spongy fibrosis³⁻⁴. Ultrasound could be a good alternative to them due to the possibility of evaluation both the urethral stenosis and the peristenotic tissue (3-4). Our purpose is determining the value of ultrasound in the diagnosis of urethral stricture and in the appreciation of peristenotic fibrosis.

Patients and Method

We conducted a prospective study over one-year period that has consisted of comparing the ultrasound of the anterior urethra to the retrograde urethrogram (RUG) in adults. Sixty adult men were recruited from the urology department and have been divided into two groups. Thirty men were considered healthy without trouble in micturition or antecedent of urine pathology.
have undergone Urethral ultrasound. The ultrasound study of the normal urethra made us familiar with normal ultrasound anatomy before studying the stenotic urethra. Thirty patients suspected of having a urethral stenosis have undergone RUG and urethral ultrasound performed on same day.

**Technical:** At retrograde urethrogram: number, degree of stenosis, length and gauge stenosis were appreciated each time on the view that unfolded it best. The length and gauge were evaluated by direct measurements on radiographic images. The degree of stenosis was obtained by dividing the diameter of the residual lumen in narrowed area on the diameter of the healthy zone downstream. Urethral Ultrasound were performed using an ultrasound General Electries Logiq E9 machine with an ML 6-15 probe. A specialized radiologist who did not know the results of RUG.

![Normal](image)

![Mild < 1/3 Lumen occluded](image)

![Moderate 1/3-1/2 Lumen occluded](image)

![Severe > ½ Lumen occluded](image)

**Fig (1): McAninch Ultrasound classification of the degree of urethral stricture**

The patient was lying supine; the urethra was distended by a retrograde perfusion of normal saline. The penile urethra has been visualized by a ventral approach, the bulbar urethra was visualized by transscrotal, and bulbo-membranous urethra was visualized transperineally. The urethral strictures were evaluated by direct measurements on the screen in their following aspects: topography, number, degree of stenosis, length, caliber. The echostructure and the corpus spongiosus peristenotic thickness were compared to those of the adjacent normal area, to appreciate peristenotic fibrosis. We adopted the classification by MacAninch of the degrees of stenosis. According to this, a mild stenosis is less than 33%, moderate between 33 and 50% and severe stenosis is greater than 50%. Examination ended with suprapubic route ultrasound of the bladder, prostate and seminal vesicles. Analysis was performed using IBM SPSS v 23.0 software. The paired t-test and correlation coefficients were calculated. In all tests, p values of ≤0.05 were considered significant.

**Results**

The average age of the 30 healthy subjects was 39.77 +/- 9.5 years old. Average diameters healthy urethra were 11.6 +/- 3.1 mm at penile level, 11.2 +/- 2.7 mm at the bulbar level and 9.7 +/- 2.88 mm at the bulbo-membranous level. The periurethral tissue thickness averaged 2.7 +/- 0.5 mm at penile level, from 3.5 +/- 0.65 mm to bulbar level and 3.8±0.6 mm at the bulbo-membranous level. The average age of 30 patients suspected to have urethral stricture was 44.8 +/- 7.71 years old.

On RUG, we observed 32 urethral strictures including 28 single and two double strictures. At the ultrasound radiologist reported 31 urethral strictures, 96.87% of which 29 single and one double strictures. Because in one patient who had two strictures (bulbar and penile), ultrasound had detected only the penile one.

At RUG, the types of urethral strictures were the following: 5 penile (15.63%), 21 bulbar (65.62%), 6 bulbo-membranous (18.75%). Locations on ultrasound were identical but one bulbar stricture less (figure 2). Urethral stricture causes were traumatic in 6 cases, 20% and post-infectious in 24 cases, 80%.

The length of the strictures was compared in an accurate way between the two techniques RUG and ultrasound. Of 26 strictures, the length of urethral stenosis measured on ultrasound is greater than that seen
on RUG. Of 6 strictures, the length is the same between the two techniques. At RUG, strictures ranged from 2 to 14 mm with an average of 5.96 +/- 3.05 mm. On ultrasound the length of the strictures varied from 3 to 25 mm with an average of 9.25 +/- 5.9 mm, there was a significant difference between the two techniques (P = 0.045). As for the caliber, it varied from 1 to 7 mm at the RUG, while from 1 to 12 mm at ultrasound with averages of 3.1 +/- 2.2 mm and 4.6 +/- 1.9 mm respectively with a significant difference (P = 0.05). The comparison of the degree of stenosis with RUG and ultrasound did not show significant difference (P = 0.66). The minimum values were 12% and 15% at RUG and ultrasound and the maximum 70% and 80% respectively (table 1). The thickness of the periurethral tissue (TPU) at the level of urethral strictures was greater to that measured in a healthy zone in all cases, whatever the portion urethral concerned. This thickness averaged 6.9 +/- 2.05 mm at the level of penis, 6.3 +/- 1.67 mm at the level bulbar urethra and 6 +/- 1.8 mm at the bulbomembranous level. The peristenotic fibrosis had more echogenicity than healthy periurethral tissue but there was no correlation between periurethral tissue thickness and degree stenosis.

![Figure (2): RUG showing urethral stricture and diverticulum](image)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>RUG</th>
<th>Ultrasonography</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average of length of stricture</td>
<td>5.96 +/- 3.05 mm</td>
<td>9.25 +/- 5.9 mm</td>
<td>0.045</td>
</tr>
<tr>
<td>Average of caliber of stricture</td>
<td>3.1 +/- 2.2 mm</td>
<td>4.6 +/- 1.9 mm</td>
<td>0.05</td>
</tr>
<tr>
<td>Average of degree of stenosis</td>
<td>12 - 70 %</td>
<td>15 – 80 %</td>
<td>0.66</td>
</tr>
</tbody>
</table>

Figure (2): shows the percentage of strictures according to their location that seen on US

Table (1): shows the comparison between RUG and Ultrasonography
Figure (3): RUG showing urethral stricture (14 mm) in length

Figure (4): perineal US showing urethral stricture

Figure (5): perineal US showing urethral stricture
Discussion

The average age of patients with urethral stricture was 44.8 +/- 7.71 years has been in line with the data from the Quirassy study. Preponderance of the infectious etiology was observed by many authors. Ultrasound diagnosed with urethral stenosis in 96.87%, these results are comparable those of Gluck’s study in which two bulbar urethral strictures were undetected without having a precise reason. In our study undiagnosed stenosis could be explained in that the patient presented a double stenosis and only the stenosis the tighter was individualized. This would be overridden with more experience of examining urethral strictures. We found that the lengths of urethral strictures were significantly greater in ultrasound than RUG, our results are consistent with those in Das [9] while differs from the results of Pierredon-Fulongna in which the lengths on ultrasound and UCAM were substantially equal. Our ultrasound measurements were not compared to the surgical results. But studies which have compared the length of the urethral stenosis determined by ultrasound and by RUG to the urethroplasty results showed better ultrasound reliability. Ultrasound measurements seemed more reliable because they have been carried out directly on the exact stenotic area without radiological magnification or distortion of the image. In our study there was a concordance of the topography of urethral strictures between RUG and ultrasound except for one bulbar stenosis. The predominance of the bulbar seat (65.62%) in our work was observed by other authors. This predominance could be due to stagnation of urethral gland secretions at this level according to Thoumas. We did not have observed a significant difference between degree of stenosis measured on RUG and ultrasound as in Pierredon-Foulongne study. On ultrasound, a periurethral tissue thickening in the portions where there were stenosis has been demonstrated in all our patients. However, we could not distinguish perstenotic tissue from the fibrosis properly. The prognostic value of the echogenicity of the perstenotic tissue could not be specified in the absence of comparison with the follow-up imaging of the patients. Several authors noted in their studies that the visualization of the fibrosis was inconstant with its ultrasound appearance, because it was hyper or isoechoic for some and hypoechoic for others. The use of a higher frequency probe would provide a better definition of perstenotic structures according to the study of Garcia. Magnetic resonance imaging can highlight any evidence of an inflammation of the urethra in the form of a diffuse thickening of the TPU which appears as an intermediate signal intensity in T2 weighed imaging.

CONCLUSION

Urethral ultrasound is an easy accessible method of diagnosing urethral stricture with a greater safety than retrograde urethrography and voiding cystourethrogram. Ultrasound can reliably replace them especially in post-infectious etiologies after proper training of the operator. Ultrasonography has more value than RUG in assessment of length and caliber of the anterior urethral stricture. Also has advantage in assessing the periurethral tissue thickness (TPU).

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Radiology and all experiments were carried out in accordance with approved guidelines.

References


Judicial Jurisdiction According to the United Nations Convention Against Corruption and its Application to the Iraqi Medical Sector

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Abstract

There is no doubt that corruption is a growing scourge in all countries due to its direct negative impact on the development of societies and limiting their development. It has also become a phenomenon with social, economic and political aspects. Combating it does not require the concerted efforts of one state institutions only, but rather the necessity for states to cooperate with each other to curb administrative and financial corruption. Since 1996, international anti-corruption conventions have served to raise political commitments to fight corruption and have defined basic international standards and practices to tackle corruption. The medical sector in Iraq suffers from corruption in its various health and administrative sectors.

Keywords: Judicial jurisdiction, Corruption, application, medical sector.

Introduction

Notwithstanding a surge in awareness and a plethora of international initiatives, many hurdles remain on the road towards a corruption-free world. To start with, there is no agreement as to what exactly constitutes corruption. Different countries and actors apply differing definitions. Even where agreement exists as to a corrupt act, jurisdictional problems may impede the prosecution of such acts. Moreover, even after a successful legal challenge of corrupt acts, the recovery of assets needs to overcome several legal and logistical hurdles in order to be successful. In addition, the link between corruption and good governance, and between corruption and human rights, remains the subject of intense debate. Iraq has continued the constitutional embrace of international law over the past 15 years by making new international commitments, including joining the United Nations Convention against Corruption. As the United Nations Secretary-General recently noted, the agreement promotes “the shared goals of good governance, stability and prosperity for the international community” and disrupts money laundering, organized crime, and theft of public funds. Iraq took a number of steps in accordance with these goals that led to, and shortly after, accession to the Anti-Corruption Convention. They included, for example, developing and maintaining “coordinated anti-corruption policies”, such as issuing an anti-money laundering law, issuing public procurement and investment laws, issuing a law mandating disclosure of assets by senior government officials, reinforcing the responsibilities of Article 5 of United Nations Convention against Corruption. In addition, the state has established and maintained “bodies, as appropriate, that prevent corruption,” such as the Integrity Commission, which has investigated thousands of corruption cases since 2004. The health sector in Iraq lives in the midst of an intractable crisis that has worsened in recent years in a country that does not know stability for several reasons that vary but are closely related to the political will of the country’s rulers. The health care system in Iraq suffers from several diseases that have decayed its body, such as the permanent shortage of medicines and the unavailability of medical staff.

The Connection between Corruption and Human Rights: When several global and regional treaties to combat corruption were adopted in rapid succession. Regarding the emergence of anti - corruption international legal standards, the Chief of Crime Conventions Section of the United Nations Office on Drug and Crimes (UNODC) maintains that: “the gradual understanding of both the scope and seriousness of the problem of corruption can be seen in the evolution of
international action against it, which has progressed from general consideration and declarative statements, to the formulation of practical advice, and then to the development of binding legal obligations and the emergence of numerous cases in which countries have sought assistance from other countries in investigating and prosecuting corruption and in tracing, freezing, confiscating and recovering proceeds of corruption offences."Bribery and embezzlement involving public officials diminishes the enjoyment of a human right. Any specific corrupt act is considered a violation or diminution of human rights.

Accordingly, “Corruption” and “bribery” Corruption and bribery are two terms often mistaken for one another or used interchangeably as they have very similar meanings. However, it is important to understand the differences between the two so that businesses can effectively manage, mitigate or hopefully prevent the problems they cause. And the Corruption, is not a technical term; it is not considered a criminal offence in most criminal codes around the world and it also does not have a legal definition in most international treaties. The most common definition is that used by the NGO Transparency International, according to which corruption is the abuse of entrusted power for private gain. Such abuse may happen on the level of day-to-day administration and public service (“petty corruption”), or on the high level of political office (“grand corruption”). These terms do not mark a legal distinction but merely describe variations of the same theme. Often, a particular scheme of corruption permeates the various levels of public administration, and thus links both forms of corruption. Because of the growing power of large corporations and non State actors such as FIFA, the abuse of obligations arising from private law—in a “private” principal-agent relationship—is also increasingly qualified as corruption. The relevant criminal offences are active and passive bribery, criminal breach of trust, graft, illicit enrichment, and so on. In the private sector, offences include anti-competitive practices and regulatory offences. This is not about any (new) human right to a corruption-free society. Such a right is neither recognized by legal practice nor is there a need for it. Rather, corruption affects the recognized human rights as they have been codified by the UN human rights covenants. In practice, what is most often affected are social rights, especially by petty corruption. For example, corruption in the health sector affects the right of everyone to the highest attainable standard of health (Article 12 ICESCR); in the education sector, the right to education (Article 13 ICESCR) is at issue. But also the classical liberal human rights may be undermined by corruption: If a prisoner has to give the guard something in return for a blanket or better food, then the prisoner’s basic right to humane conditions of detention (Article 10 ICCPR) is affected. If – as most observers tend to think – the current surge in human trafficking is made possible and facilitated primarily by corruption that induces police and border guards to look the other way, then this affects the human right to protection from slavery and servitude (Article 18 ICCPR). Obviously, corruption in the administration of justice endangers the basic rights to judicial protection, including the right to a fair trial without undue delay (Article 14 ICCPR). In the case of grand corruption and foreign bribery, however, the implications for human rights—such as the effect of nepotism on the right to equal access to public offices (Article 25(a) ICCPR)—are less clear.

The most important principles related to the implementation of the United Nations Convention are as follows:

1. The agreement is a binding legal instrument for the states parties, and the failure of the state to implement it entails its international responsibility. Article 66 of the agreement allows for the settlement of disputes between the states parties regarding the interpretation of the agreement and its application through arbitration. If the states parties are unable to agree to arbitration, the dispute may be referred to a court. International justice.

2. The implementation of the agreement shall be through the adoption of a set of legislative and administrative procedures to put the state’s commitment into practice.

3. The implementation of the convention by the national judge shall be through the frameworks laid down by national legislation that explain how to implement the convention and clarify the implementation procedures.

4. The obligation to implement the agreement does not undermine the respect for the national sovereignty of the states parties, including the exclusive exercise of the jurisdiction over their territory in all prosecution and punishment procedures, unless the mechanisms of international judicial cooperation allow for some kind of joint investigation.
Preventive Measures: It is a set of public policies aimed at preventing corruption and states must implement or activate them. Among the most important policies mentioned in the agreement are:

1. Establishing independent bodies responsible for combating corruption and cooperating with states parties to the convention,
2. Spread anti-corruption awareness
3. Establish codes of conduct for public employees and private sector employees with the aim of enhancing integrity and responsibility.
4. These measures also include the establishment of systems and regulations requiring public officials to disclose their earnings from work and any other external activities.
5. Regulating public procurement in addition to enhancing cooperation between law enforcement agencies and private sector entities,
6. It should be noted in this regard that the agreement also emphasized the role that civil society and civil organizations play in the field of prevention and preventive measures.

Criminalization and enforcement: Chapter Three of the Convention consists of twenty-eight comprehensive articles. The importance of this chapter is due to its relevance to the acts criminalized according to the convention. Accordingly, all states parties must adopt “all the legislative and other measures that may be necessary to criminalize these acts,” when they are committed intentionally. This chapter also deals with law enforcement procedures. The convention lists legislative measures to criminalize a number of acts, including but not limited to; A public official promised an undue advantage in return for performing an act or abstaining from it, or seeking or accepting a public official for an unworthy advantage, and the bribery is considered one of the most criminal and most dangerous acts, and the matter is equal in the case of bribing a public official affiliated to the state party, or bribing a foreign public official, or An employee of an international public institution as long as the purpose behind granting him such advantage is to obtain an undue benefit or advantage related to the work of that employee concerned.

The convention also criminalizes the exploitation of the actual influence of the public office, and obligates states to take the necessary legislative and other measures to criminalize the public official’s intention to abuse and exploit the public office.

Trial procedures and protection of witnesses, informants and experts: It is legally established that the procedures for any trial must be conducted in accordance with the fair trial standards established by international human rights covenants, which are affirmed by almost all state constitutions, and that conviction is only made with sufficient evidence that reaches a stage beyond reasonable doubt, and that such a trial Its existence is only conceivable if there is sufficient evidence that is legally acceptable, and that this evidence needs procedural protection, otherwise it will lose justice.

* On the other hand, the necessary measures must be taken to protect witnesses, and here comes the issue of witness protection to take on growing importance, especially when it comes to crimes related to money, and Article (32) of the Convention dealt with the issue of protecting witnesses and experts, while Article (33) dealt with Of the United Nations Convention against Corruption, protection of whistleblowers and those in a more dangerous situation than witnesses; This is because the amount is the source of the first information about the alleged crime, and this puts the amount in a situation where it needs legal protection during and after the litigation procedures. In order to achieve the goals aimed at by the convention, articles (37-38-39) deal with aspects of cooperation with law enforcement authorities on the one hand, and the cooperation of these authorities with each other on the other hand. Among the forms of corruption is the employee’s interference in the safety of more or more government tenders or the abuse of office influence in obtaining rights for others at a low price and deliberately damaging state funds, which is one of the crimes of gross negligence. General No. 19 of 2008 due to its attachment to public money and its preservation, and in accordance with Article 341 of the Iraqi Penal Code No. 111 of 1969, as amended, every employee or person assigned to a public service who causes a serious error to inflict serious damage on the funds and interests of the entity in which he works or is related to it by virtue of his position or With the money or interests of the people entrusted to him if this resulted from gross negligence in performing his job or from abuse of authority or from a serious breach of his job duties, and other laws that deal with cases of administrative and
ten years if the convict is sentenced to life or temporary
punishable by imprisonment for a period not exceeding
accompanying or transporting any of them. Escaping is
service is assigned to arrest a person or guard a person
that every employee or person charged with a public
truth. Corruption crimes, as Article (271) stipulates
Judicial rulings are considered the title of the judicial
proven to be unlawful and was the result of mediation.
and in Article (234) the issuance of a decision that was
in favor of or to the detriment of one of the litigants,
overstepping the limits of their jobs, and any of the
crimes stipulated in Articles (233, 234, 271, 272, 275,
276, 290, 293 and 296) of the Penal Code No. 111 of the
year 1969 amended and any other crime in which one of
the aggravating circumstances stipulated in paragraphs
(5, 6 and 7 of Article 135) of the effective penal code
amended by Section (6) of the Organic Law issued by the
dissolved Governing Council Attached to the dissolved
Coalition Provisional Authority Order in Iraq No. 55
of 2004, where the Iraqi legislator added crimes that
breach the course of justice, considering the judiciary
a safe haven to preserve the rights, lives, honor and
money of people, as it considered the crime of mediating
before the judiciary as corruption crimes, where every
employee or taxpayer is punished with imprisonment.
In a public service that mediated with a judge or a court
in favor of or to the detriment of one of the litigants,
and in Article (234) the issuance of a decision that was
proven to be unlawful and was the result of mediation.
Judicial rulings are considered the title of the judicial
truth. Corruption crimes, as Article (271) stipulates
that every employee or person charged with a public
service is assigned to arrest a person or guard a person
who is arrested or detained or detained or imprisoned or
accompanying or transporting any of them. Escaping
punishable by imprisonment for a period not exceeding
ten years if the convict is sentenced to life or temporary
imprisonment, or if he is accused of a felony punishable
by death, and the penalty is imprisonment in other cases
and in Article (272) of the Penal Code. Punish with
imprisonment or a fine whoever is charged with guarding
an arrested, detained or arrested person, accompanying
him or moving him and causing one of them to escape.
The Integrity Commission Law considered the crime
of forgery stipulated in Article 290 of the Penal Code
No. 111 of 1969, as amended, which stipulates that
(Whoever carries an employee and is assigned to a
public service while recording a report is within the
competence of his job, either by impersonating another
person’s name) Or by acting in a capacity that he does
not have, or by reporting false facts, or by other means
to record or prove an incorrect fact regarding a matter
that the document would prove to be proven by the legislator
as the legislator considered as one of the corruption
cases that the employee or the person charged with a
public service issued one of the aforementioned papers
with the knowledge that the one for whom it was issued
He has assumed a false name or a false personality, as
well as Article (296) of the Penal Code considered a
crime of corruption that punishes with imprisonment
whoever is legally mandated to keep books or papers
subject to the control of the public authorities, and he
writes in them things that are not true. It is possible or
omitted to record true matters in it, and that would have
deceived the aforementioned authorities and made them
into a mistake and any other crime in which one of the
aggravating circumstances provided for in paragraphs 5,
6 and 7 of Article 135 of the Penal Code in force.

More than 50% of the money allocated to building
hospitals in Iraq has been wasted, indicating that huge
sums of money were spent to build 15 to 20 large
hospitals, of which only 4 hospitals entered service. And
the reality in Iraqi hospitals in light of the Corona virus
crisis is that Iraqi hospitals are a hotbed of transmission
of infection and the spread of the epidemic between sick
people and health personnel.

International Cooperation: Under Chapter Four
of the Convention, states parties must assist each other
in combating corruption, and this chapter provides
standards for mutual legal assistance, and cooperation
comes in the form of extradition, mutual legal assistance,
transfer of judgments of persons, criminal procedures
and law enforcement cooperation, which encourages
Also, cooperation in civil and administrative matters.
Likewise, member states must, in accordance with this
chapter, take the necessary measures that would support
tracking, freezing, seizing and confiscating proceeds of
corruption.
Asset Recovery: Chapter five is one of the basic principles of the agreement, as the recovery of assets obtained from incidents of corruption is a very important issue, especially for developing countries where corruption rates are increasing.

The agreement includes the essential provisions that establish specific measures and mechanisms for cooperation with the purpose of recovering assets while preserving flexibility in recovery procedures that may be justified under special circumstances, and those provisions would support countries’ efforts to address the effects of corruption by sending a message to those responsible for committing Acts of corruption that there will be no place to hide illegal assets in the presence of international cooperation based on the recovery of the proceeds of corruption.

Jurisdiction: The United Nations Convention against Corruption requires both the requesting state party and the requested state to have jurisdiction according to the role entrusted to it in the issue of asset recovery, i.e. the state submitting the recovery request must have jurisdiction over the crime from which the money the subject of the recovery request was obtained from. The acceptance of the requested State Party shall depend on this request. She referred to this agreement condition in paragraph (1) of Article (55), which affirmed that the state party receives a request from another state party for the purpose of confiscating proceeds or property obtained from a crime of corruption that has jurisdiction over it or the tools used to commit this crime if it takes The necessary procedures, that is, the state party receiving the request for confiscation does not accept the request and does not take the necessary measures unless the state party submitting the confiscation request has jurisdiction over the crime from which the money or property to be confiscated was obtained.

Not only that, but also the preparations for the draft United Nations Convention against Corruption confirmed this condition, as it mentioned an explanatory note regarding Paragraph (1/a) of Article (54) of the Convention that the state party does not take the necessary measures to enforce a confiscation order issued by the courts of a state party. Others, by referring it to its competent authority for implementation in the event that this order is issued by a court that does not have jurisdiction over the crime of corruption and the money obtained from it.

Regarding the state party receiving the request for recovery, the agreement requires this state to also have jurisdiction in relation to the legal actions that it takes in relation to the proceeds of crime, property, money or equipment that are the subject of the recovery request. Article (52) devoted to measures to prevent and uncover the transfer of proceeds derived from a crime of corruption stipulated in this agreement, as it required the State Party that received the request to have jurisdiction to take the necessary measures regarding obligating existing financial institutions to take a set of measures in relation to opening Accounts in them, verify the identity of customers, and take reasonable steps to determine the identity of the beneficial owners of the funds deposited in high-value accounts, and to carefully examine the accounts to be opened. The state party can also inform the financial institutions that have jurisdiction over them and upon a request from another state party or on its own initiative, with the identity of natural or legal persons, by carefully examining their accounts. The request cannot undertake these measures if it does not have jurisdiction over the financial institutions that wish to undertake the aforementioned procedures.

Asset recovery through confiscation: The agreement specified three cases of freezing or seizure in paragraph (2) of Article (54), where it stipulated that the State Party, in order to be able to provide mutual legal assistance, upon a request submitted pursuant to Paragraph (2) of Article (55) of the Agreement, must: It shall, according to its national law, the following:

1. The State Party shall take the necessary measures to enable its authorities concerned with the freezing and seizure of property, in accordance with a freezing or seizure order issued by a court or other concerned authority present in the requesting State Party that constitutes a reasonable basis for the requested State Party to believe that there are sufficient reasons to take such measures and that in the end, the mentioned property will be forfeited.
2. The State Party shall take the necessary measures to enable its competent authorities to freeze or seize property and in accordance with a request issued by another State Party that constitutes a reasonable basis for the requested State Party to believe that there are sufficient reasons to take such measures and that these properties will eventually be confiscated.
3. The State party should consider taking additional measures to enable its competent authorities to
preserve property for the purpose of confiscation based on an arrest or a criminal accusation related to the possession of such property.

An explanatory note regarding Paragraph (2/a) of Article (54) (first case) indicated that the State party can choose between instituting the procedures either for recognition and enforcement of the foreign seizure or freezing order or for the use of this foreign order as a basis for obtaining a seizure or freezing order. The reference to the freezing or seizure order stipulated in Paragraph (2/a) of Article (54) should not be interpreted as requiring the enforcement of this order upon its issuance by an authority that does not have jurisdiction or recognition.

It can be said that the invitation is necessary for the drafters of the agreement to amend paragraph (2) of Article (54) to remove the ambiguity or confusion arising in it by clarifying when the request for freezing or seizure should be based on an order issued by a court or other competent authority and when the mere request is sufficient to complete this process. It is also necessary to clarify when the request is based on sufficient reasons and what are these reasons, and it is also necessary for them to indicate what the additional measures are, whether for example or exclusively.

The authority governing the confiscation: Confiscation is a complementary punishment, and since it is a punishment, it must be issued by a court ruling, meaning that a person’s money cannot be confiscated except by the court hearing a case related to a felony or misdemeanor, and by referring to the United Nations Convention against Corruption, we find that it has violated this rule and deviated from it as it came with a ruling. The meaning of the permissibility of a confiscation order issued by a non-judicial authority when defining confiscation in Paragraph (g) of Article (2) as it defined “the term confiscation, which includes forfeiture, where applicable, means the permanent deprivation of property by an order issued by a court or other competent authority.” The agreement did not indicate what this authority is, is it the public prosecutor or an administrative body.

Conclusions

1. Encouraging the states parties to the convention to adopt the mechanisms of international cooperation contained in the convention, and to include them in their domestic laws and bilateral or multilateral agreements that they conclude; Because this cooperation has a great role in reducing corruption.
2. The necessity to develop anti-corruption mechanisms in international agreements to suit the specificity of the country in which they will be applied, with an emphasis on the common goals of all these countries to achieve a high level of good governance and transparency, and not to hinder efforts made for all these countries to join global and regional conventions against corruption.
3. The necessity to establish a special body to combat corruption in every country of the world consisting of persons of credibility and integrity, to give it complete independence and to grant it full powers and immunity in conducting investigations and decision-making and to develop carefully studied strategies that apply the true concept of financial, administrative and judicial control for those who attack public money and those who commit Corruption crimes and for the United Nations Convention against Corruption to be more meaningful and effective.
4. The researcher calls on the Iraqi legislator to enact a law concerned with combating corruption and to allocate part of its articles to the international cooperation mechanisms mentioned in the agreement.
5. Cooperation internationally and regionally to combat corruption in all its forms, and other phenomena related to corruption, such as organized crime and money laundering, and to join and ratify international treaties and charters that achieve combating corruption.
6. Establishing an international court similar to the International Criminal Court, with jurisdiction over corruption crimes and the trial of the most corrupt and theft of public money, including money laundering crimes in third world countries whose people are unable to bring them to justice.

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Combating International Crimes in Iraqi Legislation

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Abstract

The terrorist financing activities are considered one of the most important threats that facing the security and safety of people of society in all its forms, as their danger increases by adopting a pattern of transnational organized crime. There is no longer planning, managing and implementing them is done within the territory of one country, but its lines are woven across multiple countries to conduct them in the targeted country with the crime. Iraq comes in the forefront of countries that suffered from terrorism and the violent crimes, in order to strike stability in it, also to sow discord and sectarian fighting for this, the Iraqi state must confront the terrorism in general, as well as the terrorist financing activities in particular, reducing its seriousness and punish the perpetrators, so, the Anti-Terrorism Law No. 13 of 2005, and the Anti-Money Laundering and Terrorist Financing Law No. 39 of 2015, was issued, as it was issued in implementation of Article 22 of the Money Laundering Law that was mentioned previously, this leads to the question about the adequacy of these legal texts to address the crime of financing terrorism, whether the Iraqi legislator succeeded in putting in place the necessary mechanisms with the appropriate part to prevent these funds for reaching to the hands of terrorist organizations.

Keywords: Terrorism, penalties, Anti-Terrorism.

Introduction

Criminal legislation did not agree on a unified concept of terrorism, as this is normal in light of the variation in their perception of terrorism (¹) because it is in what is considered a terrorist act in the eyes of a specific country or a specific community may not be considered so in the view of another country or society (²) then by referring to the Iraqi Penal Code No. 111 of 1969, it did not include a definition of terrorism, but it indicated in item (a) of Article (21) of it that the terrorist crime is not considered a political crime without specifying its concept, as this is a legislative deficiency in it, where it referred to a term without defining its concept. As for the Iraqi Anti-Terrorism Law No. 13 of 2005, terrorism was defined in its first article as: (Every criminal act by an individual or an organized group that has targeted an official or unofficial individual or groups or institutions or has caused damage to public or private property in order to disturb the security situation, stability and national unity or introduce terror or fear among people, creating chaos to achieve terrorist goals) in this way, the Iraqi legislator has followed the direction that was limited to defining terrorism without mentioning terrorist crimes, as some may see that what distinguished the definition that the legislator which he mentioned in the anti-terrorism law is that he limited terrorism to the acts that were criminalized by the law as the description was not detailed, that this is one of the advantages of the text that prevents the authority from arbitrarily using its authority in the fight against terrorism (³), while we can find others criticizing this definition in several ways, on the one hand, it was limited to the terror of individuals and groups, that the state terrorism has not been shown despite the gravity of the threat which is posed by terrorism of the state, on the other hand, others see that what the Iraqi legislator did not represent a definition of terrorism, but a description of the act of terrorism that it is counting and formulating a group of criminal acts, that which must be give a direct definition of the term terrorism, in addition, its formulation according to which the definition was established was weak, as the definition came vague, as the legislator did not show what these goals were, nor did he explain the criteria for determining them (⁴).
term terrorism financing, it has been dealt with by economists more than that dealt with by legislators, as the economists have defined it as (searching for sources through which money can be spent to spend it on implementing or conducting a plan) \( ^{(5)} \), also others define it as (taking the necessary measures to obtain funds from their appropriate sources at the appropriate time and on satisfactory terms) \( ^{(6)} \), as for the jurists of the law, they have defined the financing of terrorism as (providing or collecting, under any name, money or related services for the purpose of using it, or that he knows you will use all or part in a work that provides benefit to any individual or collective terrorist project and whether or not the result is achieved) \( ^{(7)} \). It is also it was defined as (financial support in various forms which is provided to individuals and organizations that support terrorism or who are planning terrorist operations, as the transfer may come from legitimate sources such as charities, for example, with or without intent or other illegal sources, for example, the trade of damaged goods and drugs) \( ^{(8)} \), while others went on to define it as (financial support or presenting financial support in any form for terrorism, or for those who encourage or develop its plans, or participate in or assist in it, or those who personally undertake terrorist operations) \( ^{(9)} \). In light of these definitions that are provided for the financing of terrorism, it can be said that the financing of terrorism is every act through which, whether directly or indirectly, collecting, or providing money or whatever is equivalent to it to a terrorist group or terrorist person, or the intention of the perpetrator is to use it for terrorist purposes. The sources of financing terrorism have developed in Iraq after the terrorists which occupied several cities in the northern and the western of Iraq from traditional sources of financing, which are represented by rented murder, kidnapping, robbery, armed robbery and other terrorist acts to the more organized and more self-financing sources of influence and larger, traditional internal funding sources no longer meet the aspirations of terrorist groups in Iraq, this is because these groups seek to expand their areas of influence to include new regions to disperse the international efforts to combat it on one hand, establishing terrorist bases of influence in areas that are allowed to move across international borders to facilitate the movement of their trade, whether from smuggling crude oil, antiquities or other, in addition for expanding its revenues from customs duties, whether through transit fees for foreign trade between Iraq and a number of neighboring countries, or by paying the fees to their terrorist groups to facilitate the transportation of crude oil to the sources of maritime transport through pipelines that pass in the controlled by the territories. Among the most important sources of self-financing for the terrorist groups in Iraq are the revenues from oil exports which derived from the sale of crude oil, smuggling it from dominated fields and trafficking in evil, as well as smuggling Iraqi antiquities \( ^{(10)} \). The sources of financing terrorist operations in Iraq have varied in various forms and in various styles, with the aim of continuing the sources of financing to the maximum extent possible. So the terrorists are already developing new measures and plans to finance it, that the method that succeed in combating it become, as soon as they are successful, outdated method, as terrorism like malaria is changing continually and constantly, among the most important sources of its financing are money laundering, international financing, foreign aid, external financial support, external financial transfer, and others in the absence of financial control from and to Iraq, as most terrorist operations are funded from abroad which is from suspicious sources, however, a statement issued by the White House stated that 29 of the largest groups that deal in drugs that were classified by the US Department of Justice in 2010, as its number was 63, it had an association with terrorist organizations, which indicates that administrative corruption with the loss of citizenship for the motherland will cause harm not only to the country itself, but will also harm other countries, so how it could be going on if terrorism, administrative corruption, loss of citizenship, national identity and political sectarian tension in the same country as in Iraq? Also government agencies may participate, with or without intent, in financing terrorist operations. Often times, commercial deals are conducted to finance goods such as foodstuffs, equipment, devices, etc. from outside Iraq without external financial transfer for some Iraqi merchants, then those commercial deals are disposed of and sold on the local market, therefore the financing of terrorist operations is carried out from those suspicious deals \( ^{(11)} \). When the legislator actually criminalizes something, he sets a penalty commensurate with the gravity of this act, so the punishment is a penalty determined by the law which is signed by the judge for an act that is considered a crime in the law, so the punishment, then, must be prescribed by a text in the law and must be signed within the limits of what the law says according to the principle (no crime or punishment except by text), accordingly, we will deal in this pillar with the penalties or punishments which are prescribed for the crime of financing the original, dependent and
complementary terrorism. The original penalties for the crime of financing terrorism are life imprisonment, as this is stipulated in Article (37) of the Money Laundering and Terrorist Financing Law which is conducted, while the Anti-Terrorism Law went to criminalize the financing of terrorism as a form of criminal behavior in the crime of inciting of a sectarian strife in the fourth item of the second article, whereas the financier’s punishment was specified in the second item of the fourth article as it came in it: (... the financier and anyone who enabled the terrorists to carry out the crimes that were mentioned in this law shall be punished with the punishment of the original perpetrator), meaning that this article considers him a partner in the terrorist crime, as the financier shall be punished with the punishment stated in the Anti-Money Laundering Law, as the funded terrorist crime did not take place, as it is an original actor in the crime of financing terrorism, that is, the text of Article (1) item (10) of the Anti-Money Laundering Law applies to it. But if the result is achieved, that is, if the funded terrorist crime occurred, the financier shall be punished with the punishment stipulated in the second paragraph of Article 4 of the Anti-Terrorism Law as a partner in the terrorist crime, therefore, we can sum up the financier’s penalty in general with the following penalties:

1. The death penalty: The legislator considered the death penalty to be the appropriate punishment against the terrorists, since the gravity of the danger and the gravity of the damage that results from these crimes are what prompted the legislator to decide that punishment, as it is the best deterrent for such criminals, so the legislator has done well when he stipulated that punishment despite the voices of those opposing it.

2. As we see if the Iraqi legislator added to the death penalty the maximum by taking measures to resolve terrorist cases and counting them as urgent cases, provided that there are different courts to consider their cases and fast in issuing rulings on them, so as not to delay the resolution of their cases and be subject to external and internal interference from them, then the innocent right is lost because justice has not been achieved, as there was no deterrent and decisive later on for the criminals who did not apply on them the death penalty.

The subordinate penalties, according to Article (25) of the Iraqi Penal Code are (that inflicts on the convicted by the rule of law without the need to stipulate it in the ruling) Article (20) of the Iraqi Penal Code stipulates that: (Every judgement of the death penalty entails the rule of law from the day it was issued until the time of the execution of the judgement, depriving the convict of the rights and benefits that were stipulated)

In the two preceding articles, there is invalidity of every act of management and administration that is issued during the aforementioned period, except of the will and cessation, the Personal Status Court or the Personal Material Court is appointed according to the cases which are based on the request of the public prosecution or any person of valuable interest to the convict), as the deprivation that which mentioned in this article includes the rights which were mentioned in Article (21) penalties and they are as follows:

1. Jobs and services he undertakes
2. To be a voter or elected in the representative councils
3. To be a member of the administrative or municipal councils or one of the companies or was a director
4. To be a trustee or agent
5. He must be the owner, publisher or president of a newspaper

As for the material precautionary measures in the crime of financing terrorism, the Iraqi legislator did not define the material precautionary measures, but rather he explained their types and provided for material precautionary measures that could be applied to the convict by committing the crime of financing terrorism, the measures that are confiscation with the removal or dissolution of the legal entity.

Recommendations: After we have completed our humble study, we can recommend a number of points, as it would be desirable if the competent authorities and the legislative bodies took them, as the most important of them are: The necessity of activating the national supervisory to monitor the sources of financing terrorism, especially in relation to money laundering, human smuggling and sale in the slave market. Issuing deterrent penalties for media promoters of terrorist groups and refraining from granting them legitimate descriptions. Respecting human rights and rejecting violence in all of its forms. Prosecuting cross-border crimes through cooperation and agreement with other countries in the judicial areas and facilitating, extraditing and transferring the accused to bring them to trial. The necessity for national laws in their formulation to combat terrorism and the financing of its sources to take into account all possible aspects of
them with the existence of prior studies on the nature of societies and their national also ethnic configurations, so that they do not lead to provoking counteractions from the purpose of their legislation, so that they are far from applying them to human rights violations.

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**Ethical Clearance:** All experimental protocols were approved under the College of Biotechnology and all experiments were carried out in accordance with approved guidelines.

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Assessing Knowledge and Perceptions of Health Care Workers toward Novel Coronavirus (COVID-19)

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Abstract

Objective: To assess the knowledge and perceptions of health care workers towards coronavirus (COVID-19) in most of the governorates of Iraq.

Method: A cross-sectional survey, web-based study was conducted among HCWs about COVID-19 during the last two weeks of April 2020. Knowledge and Perception were assessed by five components adapted from the Ebola knowledge scale, and A 7-item instrument this part was developed using WHO course materials on Emerging respiratory for viruses COVID-19 and distributed randomly to HCWs using social media. Descriptive statistics were used to express participants’ demographic information, mean knowledge score and mean Perception score of HCWs. Chi squares tests were used to assess the association between study variables and Perception questions was used to identify the level of association among variables at the significance level of p<0.05.

Result: (184) participated of HCWs complete the survey (64.1%) are males, aged 20-29 years (54.3%), and most of them are Nurse (64.7%) and Lab-technicians (20.1%). Regarding COVID-19, most of them used social media to obtain the information (68%), About less than half of the respondents (41.30%) opined that COVID-19 was — a severe illness transmitted to people from wild animals. Approximately 87% of respondents identified “contact by airborne droplets through breathing, sneezing or coughing” as the most common mode of transportation; Most of the participants associated COVID-19 with fever (90.80%), shortness of breath (89.10%) and coughing (76.66%). Handwashing and social distraction were chosen by most respondents (95.70%) as a method of preventing infection while 9.80% reported consuming gin, garlic, ginger, herbal mixtures and foods/soups as precautions against COVID-19. The majority of participants (81%) believed that COVID-19 is fatal; It was also noted that the social media (Whatsapp, Facebook, Instagram, Twitter etc.) are the most common source of health information about COVID-19 (65.20%). demonstrated a positive perception of prevention and control towards COVID-19. Most elements of Perception were significantly associated with gender and age at (P <0.05).

Conclusions: The results of this study showed that healthcare workers have a good knowledge and positive Perception towards COVID-19. As the global threat of COVID-19 continues to emerge, it is critical to additional education interventions and campaigns are required for healthcare workers.

Keywords: Coronavirus, outbreak, COVID-19, Media, knowledge, perceptions, healthcare.

Introduction

Covids are a huge gathering of infections regular all through society. Truly, proof has demonstrated that the infection is sent by feathered creatures and warm blooded animals, with people especially defenseless against disease and transmission of the infection⁴. Past episodes of Covids, for example, SARS-CoV and Middle East Respiratory Syndrome-(MERS-CoV) in 2003 and 2015 show similitudes with the new Covid, which was first detailed in December 2019, which is the momentum sickness in questions Which Caused Coronavirus Outbreak Worldwide, COVID-19.² It was first revealed
by the Chinese experts in Wuhan, capital of Hubei Province in China toward the finish of December 2019(3). The progressing COVID-19 pandemic was affirmed without precedent for Iraq in February 2020. Cases were affirmed in each of the nineteen Iraqi governorates until March 27, with the Kurdistan Region of Iraq representing 309 (26%) of these cases until April 8. (4) During the pandemic, Iraq announced its initially affirmed instances of SARS CoV-2 contamination on February 22, 2020 in Najaf. (5) By April, the quantity of affirmed cases surpassed 100 in Baghdad, Basra, Sulaymaniyah, Erbil, and Najaf. (6) Coronavirus fundamentally spreads from individual to individual through close contact (around 6 feet) with contaminated individuals through the respiratory framework (hacking or wheezing) or is sent by contacting a surface or something in which the infection is discovered (7). As far as manifestations, the World Health Organization revealed that over 80% of the COVID-19 patients demonstrated gentle indications and recouped with no clinical intercession, and about 20% of the influenced cases experienced serious sicknesses, for example, dyspnea, septic stun and various organ disappointments. It has been accounted for that 2% of cases can be deadly (8). Furthermore, it is analyzed through a research facility test. Contamination can prompt intense respiratory issues or demise, particularly among the older and individuals with fundamental ceaseless ailments. Notwithstanding, some tainted individuals are transporters of the infection without side effects, while just others may experience the ill effects of a mellow disease and recuperate effectively (9). As of now, there is no particular antiviral therapy and preventive antibody; Medical therapies are restricted to steady measures pointed toward mitigating side effects and the utilization of examination medications and corrective meds. Along these lines, applying a preventive measure to control COVID-19 contamination is a significant intercession. This is finished by washing hands with cleanser and water, by face covers, and confining affirmed and suspected cases (10,11). Furthermore, medical services laborers (HCWs) are at a high danger of contamination and the wellspring of transmission in the network. Some past investigations have demonstrated that HCW laborers need information and Perception about MERS CoV(12), and SARS (13). Before the finish of January, WHO and CDC (Centers for Disease Control and Prevention) proposals for the avoidance and control of COVID-19 for medical services specialist (14,15). Indeed, WHO has likewise left on various internet instructional classes and articles on COVID-19 unique dialects to advance preventive systems, including mindfulness raising, and preparing arrangement exercises in HCWs (16). This investigation planned to survey information and ideas towards COVID-19 among medical services laborers during this worldwide wellbeing emergency. Additionally, we likewise investigated the function of various data sources in molding the information and impression of COVID-19 HCWs during this pinnacle period.

Method

1. Setting and Participants: This cross-sectional survey has been carried out to assessing knowledge and perceptions of health care workers toward Novel Coronavirus (COVID-19). They were used an online questionnaire to collect data from participants. Health care workers were purposively sent the link through Social media (Whatsapp, Facebook, Telegram, and Fiber) they were asked to participate in an online survey. A snowball sampling technique was conducted using a survey instrument to obtain responses from HCWs from the provinces of Iraq during the last two weeks of April 2020.

2. Procedure: Because of social distance rules and curfews/closures, physical interaction was not possible, so online surveys were promoted and current study participants were urged to send the survey link to potential responders.

3. Instruments (the questionnaire was divided into 3 parts): The first part comprised of Social and demographic data were obtained from respondents about variables such as gender, age, marital status, Occupation, and awareness which including heard about Novel coronavirus, and attended lectures/discussions related to COVID-19.

The second part identified of respondents’ Knowledge about Novel Coronavirus COVID-19 was assessed by five components adapted from the Ebola knowledge scale developed by Rolison and Hanoch(17).


Respondents’ knowledge about Coronavirus COVID-19 is assessed by summarizing the correct
responses via Element 1, method of preventing and curbing the infection, (correct = (b) and (d), (f) or (h)), Element 2, symptoms, (correct = (a), (b) and (g)), Element 3, source of Coronavirus COVID-19, (correct = (d)), Element 4, transmission of COVID-19, (correct = (a), and (b), (c) or (d)), and Element 5, awareness of Coronavirus COVID-19 fatality, (correct = (a)), the maximum degree possible the generation of five elements. The rule is set to 3 which indicates a moderate level of knowledge about COVID-19. Scores greater than 3 indicated a high level of knowledge about COVID-19 while Scores less than 3 indicated a low level of knowledge about COVID-19. The mean score and the standard deviation for the sample population were calculated to indicate the level of knowledge of the sample. Similarly, scores above the base indicate high knowledge and score lower the base indicated low knowledge of Coronavirus COVID-19 for the sample.

The third part Which consists of Source of Knowledge about Novel coronavirus (4 element/4-point Likert scale), and perceptions toward COVID-19 (7 items/Yes or No option), This part was developed using WHO course materials on Emerging respiratory for viruses COVID-19 (World Health Organization. 18).

4. Statistical Analysis: Descriptive statistics were applied to calculate frequencies and percentages of sociodemographic data and knowledge about COVID-19, the Chi-square test was used to explore the level of correlation between variables, Considered the p-value less than 0.05 statistically significant and performed using SPSS Statistic version 19.

Results

We received responses from 184 HCWs participated, as at 2th May, 2020, which was the data cutoff collection date for this study who had completed the online questionnaires, including the respondents were aged between 20 to 60 ≥ years old (Mean 26.85, SD = 9.17), and almost all respondents (n=118, 64.1 %) are male, Regarding to marital status (58.7 %) were married. Majority of respondents are Nurse (n=119, 64.7%), and Lab-technicians (n=37, 20.1%), and almost all respondents agreed that they heard about Novel Coronavirus (COVID-19) (n=183, 99.5 %), but only (n=124, 67.4 %), of them got the chance to attend lectures/discussions about Novel Coronavirus (COVID-19) Table (1).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>Case</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Less than 20 year</td>
<td>2</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20 – 29</td>
<td>100</td>
<td>54.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30 – 39</td>
<td>62</td>
<td>33.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 – 49</td>
<td>15</td>
<td>8.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50 – 59</td>
<td>4</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60 ≥</td>
<td>1</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>118</td>
<td>64.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>66</td>
<td>35.9</td>
<td></td>
</tr>
<tr>
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<td>40.2</td>
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<tr>
<td></td>
<td>Married</td>
<td>108</td>
<td>58.7</td>
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</tr>
<tr>
<td></td>
<td>Widow</td>
<td>1</td>
<td>0.5</td>
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</tr>
<tr>
<td>Occupation</td>
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<td>2</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dentist</td>
<td>2</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pharmacists</td>
<td>5</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nurse</td>
<td>119</td>
<td>64.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lab-technicians</td>
<td>37</td>
<td>20.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Administrative</td>
<td>2</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other occupations</td>
<td>17</td>
<td>9.2</td>
<td></td>
</tr>
<tr>
<td>Heard about Novel coronavirus</td>
<td>Yes</td>
<td>183</td>
<td>99.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>1</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Attended lectures/discussions about Novel Coronavirus</td>
<td>Yes</td>
<td>124</td>
<td>67.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>60</td>
<td>32.6</td>
<td></td>
</tr>
</tbody>
</table>

N = number of samples, F = frequency, % = percentage, \( \bar{X} \) = Mean, SD = standard deviation.

When we requested about sources of information about COVID-19, it was the main source of information obtained through social media (Facebook, Twitter, Whatsapp, YouTube, Instagram, Snapchat) and official government websites. 36% of the respondents reported they use news media (TV/video, magazines, newspapers, and radio) to obtain information about COVID-19. Furthermore, over 80% of respondents sometimes discussed COVID-19 related topics with family and friends (Figure 1).
The results (Figure 2) showed that about less than half of the respondents (41.30%) opined that COVID-19 is — a severe illness transmitted to people from wild animals while 29.90% identified it as — a biological weapon designed by the government of China.

Concerning knowledge about the most common mode of transportation, approximately all (87%) were chosen to “contact drops from an infected person/object by breathing, sneezing or coughing” while slightly more than the average (76.60%) chose “touching contaminated objects” or surfaces. As a means of transmitting and communicating with the virus (Figure 3).
The high majority of the HCWs knew that washing hands with soap and water could help to prevent COVID-19 transmission (99.5%), and sick patients must share their last travel history (98.9%), and symptoms will appear in 2-14 days (97.3%). Besides, (96.2%) agreed that all equipment used in wet markets should be cleaned every day. Feeling unclear eating well-cooked meat during an outbreak of 88.6% and flu vaccination is not enough to prevent (88.6%). However, about 66.8% of the HCWs knew that were not fatal regarding COVID-19 (Table 2).

<table>
<thead>
<tr>
<th>Statements</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>COVID-19 symptoms appear in 2-14 days.</td>
<td>179</td>
<td>5</td>
</tr>
<tr>
<td>COVID-19 is fatal.</td>
<td>123</td>
<td>61</td>
</tr>
<tr>
<td>Flu vaccinated is sufficient for preventing COVID-19.</td>
<td>21</td>
<td>163</td>
</tr>
<tr>
<td>During the outbreak, eating well-cooked and safely handled meat is safe.</td>
<td>163</td>
<td>21</td>
</tr>
<tr>
<td>Sick patients should share their recent travel history with healthcare providers.</td>
<td>182</td>
<td>2</td>
</tr>
<tr>
<td>Disinfect equipment’s and working area in wet markets at least once a day.</td>
<td>177</td>
<td>7</td>
</tr>
<tr>
<td>Washing hands with soap and water can help in prevention of COVID-19 transmission</td>
<td>183</td>
<td>1</td>
</tr>
</tbody>
</table>

N = number of samples, F = frequency, % = percentage, *correct answers.

The elements of perception COVID-19 among HCWs in the study were analyzed using a test $\chi^2$ to evaluate the correlation with age, sex. (Table 4).

**Discussion**

Presently, COVID-19 is the subject of worldwide discussion in the media and among people in general, particularly among HCWs and patients. With the current increment in COVID-19 transmission that has raised pressures for everybody, including wellbeing and wellbeing framework authorities, this is an issue of how data is figured out how to help forefront laborers in general wellbeing emergency circumstances. Thus, this information and view of medical care experts can help contain the plague by forestalling and controlling COVID-19 during a worldwide scourge, which will
improve the physical and psychological well-being of people.

The aftereffects of this investigation demonstrated that a huge level of study members knew about and proficient about COVID-19. The outcomes were related with information on COVID-19 as far as respondents’ information on the wellspring of COVID-19, transmission of COVID-19, manifestations of COVID-19, preventive conduct towards COVID-19, mortality from COVID-19 and the primary wellsprings of data about COVID-19 for medical services laborers, the outcomes were altogether high.

The a large portion of HCWs (68%) utilized web-based media as a significant wellspring of data, additionally around 43% that pertinent COVID-19 updates posted online by legitimate government wellbeing specialists have indicated that they effectively affect improving the information levels of HCWs. Furthermore, hence, rely upon solid sources is a primary factor in accepting that straightforward data about a COVID-19 disease is essential for react to HCWs. These days, an assortment of data accessible on the web and this unsubstantiated data can spread rapidly and can misdirect medical care laborers. Wellbeing specialists and specialists specifically have cautioned against the inescapable falsehood of COVID-19 (19,20-12). In this regard, medical care laborers should practice cautious assessment of the data identified with COVID-19, and the first and logical substance of the data sources ought to be utilized. The aftereffects of the current investigation likewise firmly uphold comparable outcomes in which the fundamental wellspring of MERS was accounted for as the web and web-based media(22,23) (Figure 1).

The outcomes (Figure 2) indicated that about not exactly 50% of the respondents (41.30%) thought that COVID-19 is — an extreme sickness communicated to individuals from wild creatures. This is apparent of the different wellsprings of data concerning the COVID-19 that is accessible (24).

Most of respondents (87%) were about the transmission of COVID-19 through airborne drops by means of breathing, wheezing, or hacking which is like an examination by Li, Weic, et al. (25). (Figure 3).

The outcomes appeared, true to form, that medical services experts have a generally high information on COVID-19, and a decent extent concur that a lot of practices endorsed and affirmed by the World Health Organization, for example, hand washing, physical separating, surface sanitization Contaminated, school closings and public occasions, and vaporization of spots the public was important to forestall the spread of the infection. Just a couple of consented to depend on blessing oil, supplication, blistering climate and the utilization of qualities, spices and nourishments, just as chloroquine and anti-infection agents as precautionary measures for the spread of the pandemic. These outcomes are predictable with the past examination Bhagavathula et al.(26). In one examination, it was discovered that medical services laborers washing hands were higher among attendants than different specialists (27). Likewise, the most ideal approach to forestall transmission is by washing hands and utilizing social removing, sterilization of tainted surfaces. Our outcomes are like those of the Khan concentrate on Middle East respiratory disorder(28).

When all is said in done, contrasts were distinguished across various classes of HCWs in their recognitions. About 87.9% of wellbeing laborers somewhere in the range of 20 and 29 years of age understood that flu antibody was deficient to forestall COVID-19 at (p esteem 0.009) and More than 90% of a similar age gathering (20-29) understood that eating meat during an episode is sheltered at (p esteem 0.02). (99%) of HCWs decidedly accept that announcing the ongoing travel history when people are wiped out at (p esteem 0.004), and they understand that indications of COVID-19 show up between 2 to 14 days. At last, most of medical services laborers unequivocally consent to keep up handwashing with cleanser that can help forestall COVID-19 transmission (at p esteem 0.045) and tidy up hardware utilized in wet business sectors.

Conclusions

The current examination is a study to survey information and discernments about COVID-19 among medical care laborers. This examination was significant in light of the fact that it considered information about COVID-19 in the majority of the governorates of Iraq, spaces of information incorporate source, transmission, side effects, wellsprings of data, and defensive conduct toward COVID-19. The outcomes affirm that medical care laborers are completely mindful of COVID-19 and their fundamental wellsprings of data about the pandemic are customary media. As the worldwide danger of COVID-19 keeps on developing, there is a pressing need to convey wellbeing instruction crusades generally.
to medical care laborers to expand the knowledge of healthcare workers that will positively influence their perceptions towards COVID-19.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Department of Adult Nursing and all experiments were carried out in accordance with approved guidelines.

**References**

of healthcare providers towards MERS-CoV infection at Makkah hospitals. KSA 2015;3:103–12.


Assessment of Mother’s Knowledge and Attitude Regarding Newborn Care at Public Hospitals in Kirkuk City

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Abstract

Objectives: To assess mother’s knowledge and attitude regarding newborn care and find out the relationship between socio-demographic characteristics with the mother’s knowledge and attitudes in Kirkuk city.

Methodology: Quantitative approach, cross sectional study design has been carried out in Kirkuk public hospitals from period of 9 August 2016 to 26 May 2018. A non –probability/convenient sampling technique was applied in the present study. Taken those mothers whose babies age are less than one month in three public hospitals of Kirkuk city.

The questionnaire was designed and constructed by the researcher to measure the variables underlying the present study, which consists of three sections, with reliability (0.830) was measured by using Cronbach’s alpha formula.

Results: The findings demonstrate that overall knowledge mean were 1.49, which mean fair level of knowledge. Regarding to the attitudes result indicates that 88% of the sample had positive attitude. The findings indicate significant relationship between knowledge of mother with both variables type of family at p value and educational level and attendance to antenatal care while the relationship highly significant relationship received any information on newborn care during this pregnancy, mother age, occupation and rank of neonate in family. Concerning mother’s attitudes there is a significant relationship between attitude of mother and received anti tetanus vaccine, rank of neonate in family and occupation.

Keywords: Mother’s Knowledge, Newborn Care, Public Hospitals, Kirkuk City.

Introduction

Newborn is considered to be tiny and powerless, completely dependent on others for life within one minute of birth the normal newborn adapts from a dependent fetal existence to an independent one; capable of breathing and carrying on life process. The first hours are crucial because multiple organ systems are making the transition from intrauterine to extrauterine functions¹. There are many causes of neonatal deaths. Complications during pregnancy, the poor health condition of the mother, lack of proper care during pregnancy, filthy conditions during delivery, critical conditions after birth and improper newborn care are some of the major causes of neonatal mortality. Children also die due to premature birth, severe malformation, obstetric complications, or because of infections caused by harmful practices at home. It is estimated that around one percent of infants being born with major congenital anomalies around the world and it is found more common in developing and poor developed countries than in developed countries¹. Globally 4 million newborns die every year before they reach the age of one month. Out of the 1.5 million newborn die in four countries of South Asia. Approximately 3.4 million newborns die within the first week of life. Of these deaths, 66% occur during the 1st 24 hours. Late death i.e.; after 24 hours, still occur 34% and may be prevented if mothers have knowledge about newborn care including dangers sign of newborn. The care the newborn depends a lot on the knowledge, skills, and attitude of the mother. The prim gravida mothers are supposed to be lacking in knowledge and attitude of newborn care ². The majority of newborn deaths take
place in developing countries where access to health care is low. Most of these newborns die at home, without skilled care that could greatly increase their chances for survival. Skilled health care during pregnancy, child and in the postnatal (immediately following birth) period prevents complications for mother and newborn and allows for early detection and management of problems.

**Methodology**

**Design of the Study:** Quantitative approach, descriptive study design has been carried out in Kirkuk public hospitals from period of 9 August 2016 to 26 April 2018. To assess the mother’s knowledge and attitude regarding newborn care at public hospitals in Kirkuk city.

**Setting of Study:** The study was carried out in pediatric wards of three governmental hospitals in Kirkuk city (Azadi Teaching Hospital, Kirkuk General Hospital and Pediatric Hospital).

1. **Azadi Teaching Hospital:** Azadi teaching hospital is considered as one of the major hospital which is established in 1983 and located to the north of the city. The building consists of (6) floors with (400) beds, pediatric wards consist of (64) beds.

2. **Kirkuk General Hospital:** Kirkuk general hospital is one of the oldest hospitals in Kirkuk city. The building is constructed in 1945 and located in the center of the city. It consists of many departments and has (350) beds, pediatric department is one of them which includes (20) beds.

3. **Pediatric Hospital:** Pediatric hospital which is located at the center of Kirkuk city, established in 1972, it is a special hospital for pediatric that includes 120 beds, which offers the services exclusively to children.

**Sampling of the Study:** A non-probability/convenient sampling technique was applied in the present study. Taken those mothers who is their baby’s age with less than one month in governmental hospitals of Kirkuk city. Two hundred forty mothers were constituted the study sample that they were recruited from (Azadi Teaching Hospital 80 mothers, Kirkuk General Hospital 80 mothers, Pediatric Hospital 80 mothers).

**Inclusion Criteria:**
- Mother’s of neonates age (0-28) days.
- Mother’s agree to participate in the study.

**Exclusion Criteria:**
- Mother’s of neonates died at the birth.
- Mother’s of babies with congenital anomalies.
- Mother’s are unconscious or mentally retarded.

**Tools of Data Collection:** In order to collect the proper information study, the questionnaire was designed and constructed by the researcher to measure the variables underlying the present study.

**Patterns of Means of Scores Calculation:** The total mean scoring for section two (knowledge questions) in each domain regarding to the following patterns:

1. The mean of each item if equal to (1.00-1.333) indicate poor level of knowledge.
2. The mean of each item if equal to (1.334-1.666) indicate fair level of knowledge.
3. The mean of each item if equal to (1.667-2.00) indicate good level of knowledge.

The total mean scoring for section three (attitude questions) regarding to the following patterns:

1. The mean of each item if equal to (1.00-2.00) indicate negative attitude.
2. The mean of each item if equal to (2.01-3.00) indicate positive attitude.

**Pilot Study:** A pilot study was conducted on (20) mothers in Azadi teaching hospital, Kirkuk general hospital and Pediatric hospital. It was carried out from 6-10 June in 2016. The pilot study sample were excluded from the study sample. Objectives of the pilot study include the following:

1. To identify the barriers that may face the researcher during data collection.
2. To examine the cooperation of study sample
3. To estimate the time required for each mother interview
4. To determine the stability and clarity of questionnaire or study tool

Before data collection began, pilot test was conducted to assess the general of administering the instrument, and conciseness of the questions.
Reliability and Validity:

Validity: Once the questionnaire for the study is prepared it must be validated. This validation aims at assessing questionnaire according comprehension, relevance to their intended topics, effectiveness in providing useful information and the degree to which the questions are interpreted and understood by different individuals. Content validity of the instrument was determined through the use of panels (15) experts (Appendix A) to investigate the clarity of the questionnaire, the mean of expertise years of experience were 11 years. Relevancy and adequacy of the questionnaire are required in order to achieve the present study objectives. Their responses indicated that all of them had agreed upon the questionnaire content clarity, relevancy, and adequacy. Then the questionnaire was considered valid after taking into consideration their suggestions and recommendations for modification.

Reliability: To test the questioner reliability, internal consistency was measured using Cronbach’s alpha formula on twenty nurses who is excluded from the original study sample. The result of pilot study was (0.830), that indicate reliable of the questionnaire and it is acceptable and adequately to measure and assessment of these mother’s knowledge. The following formula was used for reliability estimate of stability of a measure (polite and hungler, 1999).

$$r = \frac{n \sum xy - (\sum x)(\sum y)/\sqrt{(n \sum x^2 - (\sum x)^2)(n \sum y^2 - (\sum y)^2)}}$$

$r = \text{the correlation coefficient for variable } x \text{ and } y$

$n = \text{number of sample}$

$x = \text{an individual score for variable } x$

$Y = \text{an individual score for variable } y$

$\sum = \text{the summation of.}$

Method of Data Collection: The interviews technique was done by the researcher with each selected mothers those stayed at public hospital mentioned above to get their responses and to clarify the items mentioned in the questionnaire form of the study.

Each interview took approximately (10-20) minutes with each mother. All participants were informed that the information will be kept confidential and used just for a scientific purpose. The data collected for the period between 9 August to 5 November 2016.

Statistical Analysis: All the data were coded and entered to the computer using SPSS software version 23.

Results

Table (1) raveled that more than half of samples which accounts 51.3% their babies age between (1-7) days, it means they are newborn baby and they need special newborn care, followed by both age groups (8-14) days and (15-21) days which accounts 20.0% for each group, the fewest percentages of samples 8.8% their babies age between (22-28) days. Regarding the neonate’s birth order or rank of neonate in family majority of sample their babies were first birth order or/first ranking in the family which accounts 39.6%, third and second birth order records, 25.4% and 23.8% respectively. Only few percentage of sample 11.3% their babies are fourth or more birth order, recently family size become small, although majority of samples their babies was first birth order, it means they have no experience about how to take care of newborn baby. It is worth to mention that more than half of samples 57.9% visits primary health care center four or more time, and very small percentages which accounts 5.8% have no visits (PHCC), this is good indicator for that our samples have commitment to attending (PHCC) for receiving information about newborn care and this important issue related to pre, post, and antenatal care, vast majority of samples 97.9% were received anti tetanus vaccine, and the rest of sample not received anti tetanus vaccine.

Table (1) Distribution of the sample according to antenatal and birth history

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Age of neonate</td>
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</tr>
<tr>
<td>1-7 days</td>
<td>123</td>
<td>51.25</td>
</tr>
<tr>
<td>8-14 days</td>
<td>48</td>
<td>20.0</td>
</tr>
<tr>
<td>15-21 days</td>
<td>48</td>
<td>20.0</td>
</tr>
<tr>
<td>22-28 days</td>
<td>21</td>
<td>8.75</td>
</tr>
</tbody>
</table>
Table (2) Distribution of the sample in terms of receiving information on newborn care.

<table>
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<tr>
<th>Variables</th>
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<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank of neonate in family</td>
<td>First</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>Third</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>&gt; fourth</td>
<td>27</td>
</tr>
<tr>
<td>Previous attendance to antenatal care or (PHCC) during this pregnancy</td>
<td>No visits</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>1 visits</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>2 visits</td>
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<td></td>
<td>3 visits</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>&gt; 4 visits</td>
<td>139</td>
</tr>
<tr>
<td>Received anti tetanus vaccine</td>
<td>Yes</td>
<td>235</td>
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</tbody>
</table>

Table (2) this table demonstrates that the highest percentages of samples which records 71.7% were receiving information on newborn care during this pregnancy, but only 40.0% of them receiving newborn care information since delivery/at hospital, while more than half 60.0% of samples will not receive any information about newborn care.

Table (3) Distribution of sample according to mother’s level of knowledge in all five domains.

<table>
<thead>
<tr>
<th>Knowledge Domains</th>
<th>Poor Level</th>
<th>Fair Level</th>
<th>Good Level</th>
<th>Total Mean</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>1 D 1</td>
<td>21</td>
<td>8.8</td>
<td>130</td>
<td>54.2</td>
<td>1.59</td>
</tr>
<tr>
<td>2 D 2</td>
<td>28</td>
<td>11.7</td>
<td>152</td>
<td>63.3</td>
<td>1.53</td>
</tr>
<tr>
<td>3 D 3</td>
<td>83</td>
<td>34.6</td>
<td>124</td>
<td>51.7</td>
<td>1.51</td>
</tr>
<tr>
<td>4 D 4</td>
<td>71</td>
<td>29.6</td>
<td>57</td>
<td>23.8</td>
<td>1.56</td>
</tr>
<tr>
<td>5 D 5</td>
<td>83</td>
<td>34.6</td>
<td>118</td>
<td>49.2</td>
<td>1.45</td>
</tr>
<tr>
<td>Knowledge Grand total</td>
<td>16</td>
<td>66.7</td>
<td>200</td>
<td>83.3</td>
<td>24</td>
</tr>
</tbody>
</table>

D 1-Mother’s knowledge on newborn care for Breastfeeding.
D 2-Mother’s knowledge on newborn care for Immunization.
D 3-Mother’s knowledge on newborn care for Umbilical Cord care.
D 4-Mother’s knowledge on newborn care for Thermoregulation.
D 5-Mother’s knowledge on newborn care for Danger signs.
f-Frequency.
% -Percentage.

The findings in the above Table (3) explore that fair level of knowledge of the sample records the highest percentages in all domains one, two, three, and five which accounts 54.2%, 63.3%, 51.7%, and 49.2% respectively, while only in domain number four which deals with knowledge about thermoregulation the good level of knowledge records the highest percentages which accounts 46.7%. Regarding the total mean of score, in all
five domains total mean scores were in fair levels which accounts 1.59, 1.53, 1.51, 1.56, and 1.45 and total mean score in general were 1.49 which is also fair level of knowledge. It is worth mentioning that domain number one which deals with knowledge about breastfeeding records’ the highest mean score 1.59 followed by domain number four 1.56 which deals with knowledge about thermoregulation, then domains two, and three records 1.53, 1.51 respectively. While the lowest mean score was record in domain five. This indicated to that mother’s level of knowledge in general was not bad and it was in fair level, and they need more knowledge about newborn care. In the study conducted among mother’s knowledge on newborn care for breastfeeding. And they found more than three quarter have a good knowledge this study incompatible with our present study. Related to the second domain, the present study is supported by a study carried out in Ethiopiaby Birhanu et al., (2016), who found that average knowledge level regarding immunization.

Table (4) Distribution of sample according to relationship between mother knowledge and some socio demographic characteristics.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Knowledge</th>
<th>ANOVA</th>
<th>P Value</th>
<th>CS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother age</td>
<td>2.749</td>
<td>.000</td>
<td>HS</td>
<td></td>
</tr>
<tr>
<td>Residence</td>
<td>2.996</td>
<td>.052</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td>13.232</td>
<td>.000</td>
<td>HS</td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td>2.826</td>
<td>.061</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Economic</td>
<td>2.188</td>
<td>.114</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Educational level</td>
<td>3.427</td>
<td>.005</td>
<td>Sig.</td>
<td></td>
</tr>
<tr>
<td>Age of neonate</td>
<td>.359</td>
<td>.782</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Rank of neonate in family</td>
<td>8.438</td>
<td>.000</td>
<td>HS</td>
<td></td>
</tr>
<tr>
<td>Previous attendance to antenatal care or (PHCC) during this pregnancy</td>
<td>3.400</td>
<td>.010</td>
<td>Sig.</td>
<td></td>
</tr>
</tbody>
</table>

ANOVA (Analysis of Variance), Comparative Significance CS: Highly significant (HS) at <0.01, Significant (S) at p ≤0.05, Not significant (NS) at p ≥0.05.

Table (4) The findings in this table shows that high significant relationship were found between each of mother age, occupation and rank of neonate in family at p <0.001 respectively, as explore in Table (4-1) majority of the samples their age ranged between (16-30) years old, so they are between late adolescent and young adults stage of life which is a suitable period for receiving knowledge and learning, in the same Table (4-1) more than half of sample were housewife and this is a good indicator for that the mothers in our sample have enough time for taking care of their newborn babies.

Although one quarter of sample was graduated from institute and college, most of the sample were housewife and not employed, this is a good indicator to that the mothers in this study had enough time for taking care for their babies and receiving knowledge and information about newborn care, regarding neonate’s birth order, most of neonates in the present study were first order, so the mothers have more interested to learning what is important regarded baby care.

Significant relations were found between mother’s level of educational and level of knowledge p value 0.005, it is indicated to that high level of education means good level of knowledge. Also, significant relationship was found between of mother’s level of knowledge and mothers whom visiting to PHCC during this pregnancy, at p value 0.010, one objective to PHCC is to raise mothers or caregivers level of knowledge and attitude about newborn care.

It is worth mentioning that no significant relationship were found between samples residency, religion, economic states, and age of neonate with mother’s level of knowledge.

The finding in the present study agrees with the results of previous study done by that there is significant relationship between knowledge of mother and educational level and non-significant with residence, while it disagrees with our study which found that there is non-significant relationship between knowledge of mother and their (mother age, occupation).

The result in the present study agrees with the results in the previous study done by Vinod and Anuchithra, 2014 which found that there is non-significant relationship between newborn care among prime mother and (Religion, Economic, Age of neonate).
Table (5) Distribution of sample according to relationship between mother’s knowledge and their (type of family, type of delivery, received anti tetanus vaccine, received any information on newborn care during this pregnancy and received any newborn care information since delivery/at hospital).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Knowledge</th>
<th>Mean</th>
<th>SD</th>
<th>t-test</th>
<th>p value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of family</td>
<td>Nuclear</td>
<td>1.50</td>
<td>.113</td>
<td>2.85</td>
<td>.005</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Joint</td>
<td>1.46</td>
<td>.099</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of delivery</td>
<td>Normal vaginal delivery</td>
<td>1.50</td>
<td>.111</td>
<td>1.26</td>
<td>.209</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Caesarean section</td>
<td>1.48</td>
<td>.107</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received antitetanus vaccine</td>
<td>Yes</td>
<td>1.49</td>
<td>.109</td>
<td>1.88</td>
<td>.129</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>1.41</td>
<td>.100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received any information on newborn care during this pregnancy</td>
<td>Yes</td>
<td>1.51</td>
<td>.114</td>
<td>5.02</td>
<td>.000</td>
<td>HS*</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>1.44</td>
<td>.072</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received any newborn care information since delivery/at hospital</td>
<td>Yes</td>
<td>1.49</td>
<td>.102</td>
<td>-387</td>
<td>.699</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>1.49</td>
<td>.114</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(*) Highly significant (HS) at < 0.01, Significant (S) at p ≤ 0.05, Not significant (NS) at p ≥ 0.05.

The above table demonstrates that high significant relationships were found between respondents’ knowledge and who receiving information on newborn care during this pregnancy p value <0.01 without doubt receiving information specialty at time of pregnancy affect the level of knowledge of mothers regarding newborn care.

Significant relationships were between the mother level of knowledge and the type of family, more than half of samples have nuclear family which indicated the caregiver dependent on her-self for caring of babies. In addition to that, no significant relationships were found between the type of delivery, received ATS, received any newborn care information since delivery/at hospital, p value ≥ 0.05 which records 0.209, 0.129, and 0.699 respectively.

Bofarraj, M. (2011), did a study entitled “Knowledge, attitude and practices of mothers regarding immunization of infants and preschool children at Al-Beida City, Libya“. This study agrees with our results that found there is a significant relationship between the knowledge of mother and the type of family while disagrees with our results among the relationship between the knowledge of mother and the type of delivery that found a significant relationship between them, also that agrees with our result that found non-significant relationships between the knowledge of mother and the (Received antitetanus vaccine). A study was done by Timilsina and Dhakal, 2015 to examine the knowledge on postnatal care among postnatal mothers this study disagrees with our present study results which found non-significant relationship between the knowledge of mother and received any information on newborn care during this pregnancy, while it agrees with our results among relationship between knowledge of mother and received any newborn care information since delivery/at hospital. According to the researcher point of view, children are the future of any nation. It is well established that the welfare of a child and his future are totally dependent upon the care and attention bestowed upon him before and after birth. The care of children had always traditionally been the forte of mothers irrespective of education.

Conclusions

The main conclusions in this study are:-More than half of the sample mother age ranged between (16-20) years and (21-25) years old, and proportion of urban record higher percentage. More than half of the sample were housewives and highest percentage of the sample gain institute or college degree. According to economic status most of them have a sufficient. More than half of the sample were nuclear family. Majority of the sample their age of neonate ranged between (1-7) days. Significant relationship was found between knowledge of mother and the type of family, educational level and previous attendance to antenatal care or primary health
care center during this pregnancy. Non-significant relationship was found between knowledge of mother and the type of delivery, received anti tetanus vaccine, received any newborn care information since delivery/ at hospital, residence, religion, economic and age of neonate. Significant relationship was found between attitudes of mother and their received anti tetanus vaccine, occupation and rank of neonate in family, while remaining variable were non-significant.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the University of Sulaimani and all experiments were carried out in accordance with approved guidelines.

**References**


Determination of Premature Birth Causes at Bint Al Huda Teaching Hospital

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Abstract

Objectives: The study aims to: To Determination Causes of Premature Birth at Bent-Al-Huda Teaching Hospital in Al Nasiriya City.

Methodology: Descriptive study design was conducted throughout the present study for period from 6th February 2020 to 1st September 2020. A purposive (non-probability) sample of 100 patients at Bent-Al-Huda Teaching Hospital in Al Nasiriya City. Data were collected through the questionnaire constructed and the self-administrative reporting process. The questionnaire consisted of two parts: parents’ socio-demographic variables (age, educational level, occupation, monthly income and residence). The second part consists of questions related to causes of premature birth. The validity of the content of the instrument was determined by a panel of experts, and the internal consistency of the instrument was determined through a pilot study and the calculation of the alpha correlation coefficient (r = 0.870). Analyzing Data by descriptive and inferential statistical approaches using (SPSS) version 20.0.

Results: The findings shown that most of sample were fall in the age group 19-24 years old. The majority of premature birth gender are male, Level of education, the greater number of study sample do not read and write and they are accounted for (30%) of the sample, the occupation status, the results showed that the highest percentages in the studied sample are (have no work), and are considered (70%). Most of the monthly income of the study sample studied are insufficient and are considered (60%). They majority of study sample were lives in rural area. The results of study show the highest percent of prevalence of these causes of premature birth among women which are (Malnutrition, Diseases in pregnancy, Early rupture of membranes, Repeated abortion and premature birth, early cervix Dilation and different blood type), there is statistically significant differences between causes of premature birth and (mother age, educational level and occupation) and there is non-statistically significant differences between causes of premature birth and (gender of premature birth, income and residence) at (p value > 0.05), when analyzed by Chi-Square Tests.

Recommendations: The study recommended to do Provide instructional heath education to pregnant women to increase their knowledge about causes of premature birth.

Keywords: Causes of Premature Birth, Pregnant women.

Introduction

If the baby is born before the 37th week of pregnancy, it is called premature birth. Some preterm births happen on their own: the mother has contractions and the baby is born premature¹. In other cases, pregnancy problems encourage doctors to give birth earlier than expected. About three-quarters of preterm births are spontaneous and about a quarter are due to medical complications. Overall, approximately one in eight pregnant women gives birth prematurely². Preterm delivery is associated with 5–18% of pregnancies and is the leading cause of infant morbidity and mortality. Spontaneous premature birth, a syndrome caused by multiple pathological processes, leads to 70% of premature births. Prevention
and treatment of premature birth are long-standing problems. Summarize current understanding of disease mechanisms associated with this condition and review developments related to intraamniotic infection, decidual aging, and impaired maternal and fetal tolerance.

The success of progesterone therapy in preventing preterm birth in a high-risk group of patients is cause for optimism. Unraveling the mystery of premature birth, which endangers the health of future generations, is a difficult and valuable scientific task.

**Objectives of the study:**

1. To Determination Causes of premature birth at Bint Al Huda Teaching Hospital.
2. To find out association between causes of premature birth and socio-demographic variables of the study sample.

**Methodology**

In this chapter present the following:

**Design of study:** Descriptive study design was conducted throughout the present study for period from 6th February 2020 to 1st September 2020.

**The setting of the study:** Study was conducted at Bint Al Huda Teaching Hospital in Al Nasiriya City.

**Sample of the study:** Randomize sampling of (100) patients that come and admitted to at Bint Al Huda Teaching Hospital in Al Nasiriya City.

**Criteria:**

A. Pregnant women at second and third trimester.
B. Patients accepted to cooperate in in study.

**Tool of study:** In order to determine the causes of premature birth the researchers constructed questionnaire consists of:

**Part 1: Socio demographic characteristics** includes (mother age, gender of child, educational level, occupation, monthly income, and residency).

**Part 2: Questionnaire consist of questions related to causes of Premature Birth:** includes (causes related mother, causes related uterus and placenta, and causes related fetus).

**Ethical Considerations:** Official permission was obtained from the administrative of Thi-Qar health office and from patients at Bint Al Huda teaching hospital before their inclusion in the study. The nature and aims of the study were explained to each of the participants.

**Data collection:** The data when collected with constructed questionnaire though an application direct interviewing and indirect answers as mean of data collection.

**Statistical analysis:** Data was analyzed using IBM SPSS (version 20) to data was presented as number and percent data analyzed through an application of frequency and percent.

**Results**

**Table (1): Distribution of the Study Sample According to the Demographical Variables**

<table>
<thead>
<tr>
<th>Basic Information</th>
<th>Groups</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother age</td>
<td>12 – 18</td>
<td>25</td>
<td>25.0</td>
</tr>
<tr>
<td></td>
<td>19 – 24</td>
<td>30</td>
<td>30.0</td>
</tr>
<tr>
<td></td>
<td>25 – 31</td>
<td>25</td>
<td>25.0</td>
</tr>
<tr>
<td></td>
<td>32 – 38</td>
<td>12</td>
<td>12.0</td>
</tr>
<tr>
<td></td>
<td>39 years and more</td>
<td>8</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Mean±SD</td>
<td>23.2±1.083</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender of Premature Birth</td>
<td>Male</td>
<td>63</td>
<td>63.0</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>37</td>
<td>37.0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
This table shows that (30%) of pregnant women are in the age group (19-24) years, with mean (23.2) years. Concerning the gender of preterm birth, the largest number of study sample are male (63.0%), and the level of education, were largest number of them read and write and constituted (30%) of the sample. Regarding the occupation, the results showed that a higher percentage of the studied sample is (have no work) (70%) of the study sample. The majority of monthly income of the study sample individuals are insufficient (60%), and the residency are most of the study sample live in the urban area (57%).

### Table (2) Statistics of Study Sample Regarding Causes of Premature Birth

<table>
<thead>
<tr>
<th>No</th>
<th>Items</th>
<th>Yes</th>
<th></th>
<th>No</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Causes Related to Mother</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Malnutrition.</td>
<td>62</td>
<td>62.0</td>
<td>38</td>
<td>38.0</td>
</tr>
<tr>
<td></td>
<td>Diseases in pregnancy.</td>
<td>88</td>
<td>88.0</td>
<td>22</td>
<td>22.0</td>
</tr>
<tr>
<td></td>
<td>Early rupture of membranes.</td>
<td>55</td>
<td>55.0</td>
<td>45</td>
<td>45.0</td>
</tr>
<tr>
<td></td>
<td>Chronic diseases of the mother such as blood pressure, heart disease and kidney disease</td>
<td>44</td>
<td>44.0</td>
<td>56</td>
<td>56.0</td>
</tr>
<tr>
<td></td>
<td>Chronic anemia</td>
<td>25</td>
<td>25.0</td>
<td>75</td>
<td>75.0</td>
</tr>
<tr>
<td>2</td>
<td>Causes Related Uterus and Placenta</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repeated abortion and premature birth.</td>
<td>65</td>
<td>65.0</td>
<td>35</td>
<td>35.0</td>
</tr>
<tr>
<td></td>
<td>Early cervix dilation.</td>
<td>77</td>
<td>77.0</td>
<td>23</td>
<td>23.0</td>
</tr>
<tr>
<td></td>
<td>Tumors</td>
<td>10</td>
<td>10.0</td>
<td>90</td>
<td>90.0</td>
</tr>
<tr>
<td></td>
<td>Placental detachment.</td>
<td>20</td>
<td>20.0</td>
<td>80</td>
<td>80.0</td>
</tr>
</tbody>
</table>
### Table (3): Association of Causes of Premature Birth and Socio-demographic Variables of Study Sample

<table>
<thead>
<tr>
<th>Variables</th>
<th>Socio-demographic</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean±S.D.</td>
</tr>
<tr>
<td>Mother age</td>
<td>100</td>
<td>2.41±1.083</td>
</tr>
<tr>
<td>Gender of Premature Birth</td>
<td>100</td>
<td>1.37±0.485</td>
</tr>
<tr>
<td>Education Level of Mother</td>
<td>100</td>
<td>2.28±0.996</td>
</tr>
<tr>
<td>Occupation</td>
<td>100</td>
<td>1.61±0.!51</td>
</tr>
<tr>
<td>Income</td>
<td>100</td>
<td>1.86±0.349</td>
</tr>
<tr>
<td>Residence</td>
<td>100</td>
<td>1.53±0.502</td>
</tr>
</tbody>
</table>

This table shows there is statistically significant association between causes of premature birth and (mother age, educational level of mother and occupation) and there is non-statistically significant differences between causes of premature birth and (gender of premature birth, income and residence) at (p value > 0.05), when analyzed by Chi-Square Tests.

### Discussion

**Part-I: Discussion Association between Causes of Premature Birth and Socio-Demographic Variables of the Study Sample:** Related to determination causes of premature birth in Bint Al Huda Teaching hospital in Al Nasiriya city. The results of the study show that most of the study sample occurrence of these causes which is (Malnutrition, Diseases in pregnancy, Early rupture of membranes, Repeated abortion and premature birth, early cervix Dilation and different blood type), this results agree with study done by Goldenberg et al\(^7\) that group of factors that contribute to causes premature birth such as nutrition, some diseases during pregnancy, premature rupture of membrane, and previous cases of preterm baby. These finding support and agree present study.

**Part-II: Association of Causes of Premature Birth and Socio-demographic Variables of Study Sample:** The present study findings shows statistically significant association between causes of premature birth and mother age these results supported by Schleußner\(^8\), that said the maternal age is the ones of causes of premature birth. Regarding the gender of premature birth Di Renzo et al\(^9\) that concluded male gender is an independent risk factor for negative pregnancy outcomes. Evidence suggests that female have an advantage over male with better perinatal outcomes, especially after preterm labor, these finding result not compatible with present finding that funded there is no association between gender of premature birth with labor. Regarding mother level of education with premature birth, result of the present study accompanied with result funded by Shah et al\(^10\) significant association between mother education and incidence of premature birth. Klerman et al\(^11\) disagree...
with present study findings due to who funded there is relationships between residence and family income with premature birth.

**Conclusion**

1. A highest percent of the study sample were male gender premature more than females, they women with low level of education were read and write, and primary school and married. They were no have work, having insufficient monthly income.

2. The determination causes of premature birth are (Malnutrition, Diseases in pregnancy, Early rupture of membranes, Repeated abortion and premature birth, early cervix Dilation and different blood type).

**Recommendations:**

1. Extensive and comprehensive population-level (national) studies can be carried out to determine the causes of preterm birth.

2. Provide instructional health education to pregnant women to increase their knowledge about causes of premature birth.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the University of Basrahand all experiments were carried out in accordance with approved guidelines.

**References**


Comparison of Average Inhibition Zones of Methanolic Extracts of *Chaetomium globosum* on the Growth of Different Groups of Pathogenic Micro-Organisms

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Abstract

The objectives of this study were analysis of the secondary metabolite products and evaluation of antibacterial activity. The FTIR analysis of *Chaetomium globosum* proved the presence of functional group assignment Alkyl halides, Amide, and Alkane with Peak (Wave number cm⁻¹) 1018.41 (Strong), 1238.30 (Strong), 1317.38 (Strong), 1379.10 (Strong), 1614.42 (Bending), 2850.79 (Strong), 2920.23 (Strong). Zone of inhibition (mm) of test bacterial strains to *Chaetomium globosum* bioactive compounds and standard antibiotics were (4.00±0.31), (4.77±0.13), (5.00±0.16), (3.22±0.41), and (4.29±0.11) uses *Chaetomium globosum* bioactive compounds, and (2.01±0.10), (1.77±0.41), (1.98±0.11), (2.00±0.30), and (1.05±0.42) uses Rifambin, and (2.42±0.18), (2.12±0.46), (1.40±0.12), (1.00±0.10), and (2.90±0.47) uses Kanamycin for *Staphylococcus aureus*, *Escherichia coli*, *Proteus mirabilis*, *Klebsiella pneumonia*, *Pseudomonas eurigenosa* respectively. *Chaetomium globosum* was very highly active against *Escherichia coli* (4.77±0.13).

Keywords: *Chaetomium globosum*, FT-IR, Secondary metabolites.

Introduction

Chaetomium species are widespread worldwide in soil and plant debris. *Chaetomium globosum* is a well-known mesophilic member of the mold family Chaetomiaceae. It is a saprophytic fungus that primarily resides on plants¹, soil, straw, and dung. Both the C. globosum hyphae and the spores contain antigens such as Chg45, to induce IgE and IgG antibody production in allergic individuals. Although the IgE upsurge is transient, increased IgG levels persist in the serum. This can lead to non-atopic asthma, sinusitis, and respiratory illnesses in the residents of contaminated buildings.² Such allergic onsets can be prevented with the use of potassium chlorate in building materials. Chlorate, toxic to many fungal strains, disrupts nitrate reduction in fungi by using fungal nitrate reductase to produce the toxic chlorite. Although it is unclear as to whether C. globosum contains nitrate reductase, chlorate is still a well known C. globosum toxin. However, even though chlorate suppresses perithecia formation, it does not affect hyphal growth nor sporulation. Secondary metabolites often play an important role in plant defense against herbivory and other interspecies defenses. Humans use secondary metabolites as medicines, flavourings, pigments, and recreational drugs.⁴ Secondary metabolites aid a host in important functions such as protection, competition, and species interactions, but are not necessary for survival. One important defining quality of secondary metabolites is their specificity. Usually, secondary metabolites are specific to an individual species, though there is considerable evidence that horizontal transfer across species or genera of entire pathways plays an important role in bacterial (and, likely, fungal) evolution. Research also shows that secondary metabolism can affect different species in varying ways. In the same forest, four separate species of arboreal marsupial folivores reacted differently to a secondary metabolite in eucalypts.⁶

Materials and Method

After growing on potato dextrose agar (PDA) medium at 25°C for 4 days, the fresh mycelium of strain *C. globosum* No. 04 was inoculated in liquid medium
containing: Oat flour 80 g, maltose 10 g, yeast extracts 2 g dissolved in 1,000 mL dH2O. The pH was adjusted to 6.0 before autoclaving. Fermentation was carried out in 2 L flasks each containing 1 L medium on a rotary shaker at 180 r/min, 25 °C for 8 days, and the cultures were used for the extraction and isolation.

Fourier transform infrared spectrophotometer (FTIR): The powdered sample of Chaetomium globosum products was treated for FTIR spectroscopy (Shimadzu, IR Affinity, Japan). The sample was run at infrared region between 400 nm and 4000 nm.

Antibacterial activity: Determination of antibacterial activities of pure extract of C. globosum cultures performed using streak-plate method. Mueller Hinton agar plates were prepared and inoculated with C. globosum cultures by a single streak of inoculum in the center of the petri dish and incubated at 27°C for 4 days. Antagonism was measured by the determination of the size of the inhibition zone in millimeters.

Results and Discussion

The FTIR analysis of Chaetomium globosum proved the presence of functional group assignment Alkyl halides, Amide, and Alkane with Peak (Wave number cm⁻¹) 1018.41 (Strong), 1238.30 (Strong), 1317.38 (Strong), 1379.10 (Strong), 1614.42 (Bending), 2850.79 (Strong), 2920.23 (Strong). Zone of inhibition (mm) of test bacterial strains to Chaetomium globosum bioactive compounds and standard antibiotics were (4.00±0.31), (4.77±0.13), (5.00±0.16), (3.22±0.41), and (4.29±0.11) uses Chaetomium globosum bioactive compounds, and (2.01±0.10), (1.77±0.41), (1.98±0.11), (2.00±0.30), and (1.05±0.42) uses Rifambin, and (2.42±0.18), (2.12±0.46), (1.40±0.12), (1.00±0.10), and (2.90±0.47) uses Kanamycin for Staphylococcus aureus, Escherichia coli, Proteus mirabilis, Klebsiella pneumonia, Pseudomonas aeruginosa respectively. Chaetomium globosum was very highly active against Escherichia coli (4.77±0.13). Infrared spectroscopy provides a useful method for herbal analysis and elucidate the compounds structures as well as for quantitative analysis of drugs. Recently, a number of plants have been reported for antibacterial properties across the world. It is hoped that this study would direct to the establishment of some compounds that could be used to invent new and more potent antibacterial drugs of natural origin. Further work will emphasize the isolation and characterization of active principles responsible for bio-efficacy and bioactivity. The differences in the susceptibilities of Gram positive and Gram negative bacteria to Streptomyces extracts have been observed by previous workers. Gram negative bacteria are inherently more resistant to antimicrobials than Gram positive organisms and this has been ascribed to the combined exclusion of antimicrobial compounds by double membrane barrier and transmembrane efflux present in this group of organisms. The three main classes of fungal secondary metabolites are: polyketides, nonribosomal peptides and terpenes. Although fungal SMs are not required for growth they play an essential role in survival of fungi in their ecological niche.

The goal of absorption spectroscopy techniques (FTIR, ultraviolet-visible (“UV-Vis”) spectroscopy, etc.) is to measure how much light a sample absorbs at each wavelength. The most straightforward way to do this, the “dispersive spectroscopy” technique, is to shine a monochromatic light beam at a sample, measure how much of the light is absorbed, and repeat for each different wavelength. (This is how some UV–vis spectrometers work, for example).

<table>
<thead>
<tr>
<th>No.</th>
<th>Peak (Wave number cm⁻¹)</th>
<th>Intensity</th>
<th>Corr. Area</th>
<th>Type of Intensity</th>
<th>Bond</th>
<th>Type of Vibration</th>
<th>Functional group assignment</th>
<th>Group frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1018.41</td>
<td>61.727</td>
<td>0.277</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>2.</td>
<td>1238.30</td>
<td>81.739</td>
<td>0.396</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>3.</td>
<td>1317.38</td>
<td>83.193</td>
<td>0.054</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>4.</td>
<td>1379.10</td>
<td>81.889</td>
<td>0.035</td>
<td>Strong</td>
<td>C-F</td>
<td>Stretch</td>
<td>alkyl halides</td>
<td>1000-1400</td>
</tr>
<tr>
<td>5.</td>
<td>1614.42</td>
<td>79.693</td>
<td>0.163</td>
<td>Bending</td>
<td>N-H</td>
<td>Stretch</td>
<td>Amide</td>
<td>1550-1640</td>
</tr>
<tr>
<td>6.</td>
<td>2850.79</td>
<td>86.184</td>
<td>0.321</td>
<td>Strong</td>
<td>C-H</td>
<td>Stretch</td>
<td>Alkane</td>
<td>2850-3000</td>
</tr>
<tr>
<td>7.</td>
<td>2920.23</td>
<td>81.949</td>
<td>0.993</td>
<td>Strong</td>
<td>C-H</td>
<td>Stretch</td>
<td>Alkane</td>
<td>2850-3000</td>
</tr>
</tbody>
</table>
Figure 1. Fourier-transform infrared spectroscopic profile solid analysis of Chaetomium globosum

Figure 2. Anti-Bacterial activity against Pseudomonas eurogenosa

Figure 3. Anti-Bacterial activity against Klebsiella pneumoniae
Figure 4. Anti-Bacterial activity against *Proteus mirabilis*

Figure 5. Anti-Bacterial activity against *Escherichia coli*

Figure 6. Anti-Bacterial activity against *Staphylococcus aureus*
Conclusion

Chaetomium globosum proved the presence of functional group assignment Alkyl halides, Amide, and Alkane. Chaetomium globosum bioactive compounds and standard antibiotics were (4.00±0.31), (4.77±0.13), (5.00±0.16), (3.22±0.41), and (4.29±0.11) uses Chaetomium globosum bioactive compounds, and (2.01±0.10), (1.77±0.41), (1.98±0.11), (2.00±0.30), and (1.05±0.42) uses Rifambin, and (2.42±0.18), (2.12±0.46), (1.40±0.12), (1.00±0.10), and (2.90±0.47) uses Kanamycin for Staphylococcus aureus, Escherichia coli, Proteus mirabilis, Klebsiella pneumoniae, Pseudomonas eurogenosa respectively. Chaetomium globosum was very highly active against Escherichia coli (4.77±0.13).

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: In our research, all protocols were approved under the Department of Biology, College of Science for women, University of Babylon, Hillah city, Iraq and all method were carried out in accordance with approved guidelines.

References


Bacteriological and Molecular Study of *Klebsiella Pneumoniae* Isolated from Patients with Urinary Tract Infections from Several Hospitals in Baghdad

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Abstract

This study obtained 20 isolates of *Klebsiella pneumoniae* from out of 50 isolates collected from patients with urinary tract infection; all isolates were diagnosed and then the sensitivity test for isolates was performed using the discs method (Kirby-Bauer) to determine the resistance of *K. pneumoniae* to 10 antibiotics. The results detected that the highest resistance was against Ampicillin, Cefotaxim, and Piperacillin by 100% for each of them, while the rest of the antibiotics had a resistance percentage of 80% for Trimethoprim, 54% for Gentamicin and 65% for Azithromicin, however the lowest resistance was found against Imipenem, Chloramphenicol and Ofloxacin by 4%, 12. % and 35% respectively. The genomic bacterial DNA of studied isolates was extracted and the genotyped was performed identify the genetic relationships between the bacterial isolates using ERIC-PCR method. The results of the study showed the presence of 12 genotypes and also the results revealed the presence of two clones, each of which contains similar genotypes, while the rest of the isolates contain different genotypes.

Keywords: *Klebsiella pneumoniae*, antibiotic resistance, ERIC-PCR.

Introduction

*Klebsiella pneumoniae* is one of the most important genera of the Enterobacteraceae family. It is characterized by being Gram-negative bacilli, non-motile, and lactose fermented, non spore forming, appear under the microscope are made up of thick edges, as the edges are curved outward and have rounded ends and have a capsule that increases its pathogenicity (Braun et al., 2004; Bensen 2001; Sambrook et al., 2001). It was called by this name in the nineteenth century in relative to its discoverer Edwin Klebs, a German-born scientist, in 1834 (Brise et al. 2005).

*K. pneumoniae* is one of the causative agents of opportunistic diseases in humans, including respiratory tract infection, Burns inflammation, wounds inflammation, septicemia, diarrhea, and liver abscesses (Zhang et al., 2018).

Urinary tract infection is one of the most common diseases caused by *K. pneumoniae* after *Escherichia coli*. Moreover, it is become more dangerous for people who suffer from Diabetics, alcoholics, pulmonary deficiency, immune suppressive, and hospitalized patients especially in intensive care units, thus the accurate and rapid diagnosis is required to prevent the infection in hospitals (Li et al., 2012; Chiu et al., 2013; Guo et al. 2016).

*K. pneumoniae* bacteria possess many virulence factors including production of polysaccharide, capsule, serum resistance, production of iron siderophore, production of enterotoxin and urea and thus this bacteria with high virulent in addition to developing its resistance to many antibiotics (Navan-venzia et al., 2017; Dubey et al., 2013).

The major reasons for *K. pneumoniae* resistance to antibiotics including beta-lactam antibiotics is due to producing the broad-spectrum of beta-lactamase (ESBL) which is one of the most important problems of increased infection in hospitals, or through the changing of the permeability barrier or in the target site.
represented by penicillin binding protein, or alteration of outer membrane protein (Aghamohammad et al., 2018). Additionally, K. pneumoniae have many Efflux Pumps that expel the antibiotic to the outside. Beta-lactam antibiotics include a group of antibiotics including penicillins, cephalosporins, carbenems and monobactam (Livermore, 2012; Sachse et al., 2012, Levinson., 2016).

Trimethoprim inhibits dihydro pterotese Synthetase (DHPS) and dihydro folate reductase (DHFR), which are involved in the synthesis of bacterial DNA, and K. pneumoniae showed high resistance to Trimethoprim. The reason for this resistance is via modulating the target site that bind with the enzymes, and also having encoded genes carrying on conjugate plasmids that may be acquired or given to other bacteria present in the same culture medium, as well as containing a flow mechanism that changes the membrane permeability (Shin et al., 2015).

Moreover, K. pneumoniae possesses multiple mechanisms to resist aminoglycoside; these mechanisms including its production of the three modulating enzymes: Acetyl transferase, Phospho transferase and Adenal transferase (Serio et al., 2017). Additionally, K. pneumoniae have several mechanisms of resistance to antibiotics including Quinolones antibiotics such as Ciprofloxacins, Norofloxacins, Levofloxacin and Ofloxacins. These mechanisms involved the modulation of the target site that bind with the antibiotics by triggering chromosomal genetic mutations in the genes encoding for DNA grease or Topoisase resulting in producton of different enzyme that is resistant to these antibiotics. K. pneumoniae also have OqxAB and QepA efflux Pumps on the outer membrane of the bacteria that serve to expel the antibiotic to the outside and prevent the permeability of it (Jacoby, 2017).

Genotyping method are important in finding the genetic affinity between bacterila isolates and also in the classification of bacteria, identification the sources of infection and characterization of the most pathogenic strain. There are several method of genotyping including Enterobacterial Repetitive Intergenic consensus method which is easy and rapid method that does not need long time and less expensive in comparison with other method (Goudarzi et al., 2011).

Aims of the study:
1. Isolation and diagnosis of Klebsiella pneumoniae from patients with urinary tract infections.
2. Determination the resistance and sensitivity of Klebsiella pneumonia to antibiotics.
3. Detection the genotyping and genetic relationships of Klebsiella pneumonia using ERIC-PCR method.

Materials and Method
1. Bacteria isolation: 50 samples were collected from patients with urinary tract infections, male and female, from several hospitals in Baghdad (Central Child Hospital, Medical City, Al-Yarmouk Hospital, Child Protection Hospital) for the period from 1/10/2019 to 6/12/2019.
2. Diagnosis of Isolates: Samples were diagnosed using blood agar and MacConkey agar culture media. For final diagnosis of isolates, Vitek 2 system was used.
3. The sensitivity of the bacterial isolates was performed using the discs diffusion method (Kirby-Bauer) to determine the resistance of K. pneumoniae for 10 antibiotics included Ampicilin, Cefotaxime, Piperacilin, Gentamycin Sulfamethoxazole + Trimethoprine, Imipenem, Ciprofloxacin, Azithromycin, Ofloxacin and Chloramphenicol. The measurement of the inhibition zone diameter with around the antibiotic discs was performed and compared with the tables of international measurements (CLSI, 2017).
4. DNA Extraction: Genomic DNA extraction and Purification Kit was used to extract the bacterial DNA according to manufacturer instructions (Promega,USA).
5. The genotyping of K.pneumoniae: it was performed using PCR technique to detect the genotype of ERIC gene using the following primers:

   ERIC (F): 5’ - ATG TAA GCT CCT GGG GAT TCA C-3

   ERIC (R): 5’ - AAG TAA GTG ACT GGG GTG AGC G-3

The results of this test included the production of bands with variable size. The reaction mixture included 20 μL of GO Taq Green Master Mix10, 2 μL of DNA template, 2 μL of each primer and 6 μL of deionized (molecular) distilled water. The reaction conditions was programed according to the manufacturer instructions (Promga, USA) with some modifications as following (Mehr et al., 2017):
1. The initial denaturation with the single cycle at 94°C for 3-minute.

2. DNA amplification using one cycle at 94°C. In order to attach the primer with DNA template, 35 cycles was used and each cycle included the following steps:

   A- Anneling stage: one cycle at 48°C for 1 minute.

   B- Extension stage: at 72°C for 2 minutes.

   C- Final Extension stage: one cycle at 72°C for 5 minutes.

6. The reaction products were separated using agarose gel (Bio Basic Inc, Canada) (2%) containing 5 μl of Ethidium bromide (Promega USA), and using DNA ladder (100-1500) base pair with a voltage difference of 100 volts for 80 minutes and imaged using UV light (Optima, Japan).

   Results and Discussion

After performing the laboratory tests, 20 isolates of Klibsiella pneumoniae were obtained from a total of 50 samples collected from patients with urinary tract infections from several hospitals in Baghdad.

   K.pneumoniae are among the most important causes of urinary tract infections, fees, burn, respiratory tract infections and bacteremia (Le et al., 2012).

   The results of this study revealed that the highest resistance and sensitivity of K. pneumoniae to the studied antibiotics was against Ampicillin by 100%, Cefotaxime by 100%, Piperacillin by 100% and for Trimethoprim by 80%, while the rest of the antibiotics, the resistance percentage was 54% for Gentamicin and 65% for Azithromycin. Furthermore, the lowest resistance was against Imipenem 4%, 12% for Chloramphenicol and 35% for Ofloxacin as shown in Figure (1).

   Intereastingly, our results are consistent with the findings of Mehr et al. (2017) study where it showed resistance to Chloramphenicol by 14%. The results of the current study also in agreement with the results of the Algarawy (2016) study that found the resistance to Piperacillin was 91.1%; however it is inconsistent with the results of Vasaikar et al. (2017) study that reported the resistance to Piperacillin was 79%. The results of this study also were consistent with the findings of Chasemian et al. (2018) study that isolated K. pneumonia which isolated from several hospitals in Tahran and found that the resistance to Cefotaxime was 94.6%; although our results not consistent with the results of Babakhani et al., 2015 study where the resistance to Ofloxacin was 86%.

Moreover, the current results were also in agreement with the results of Mustafa (2018) study which showed that the resistance of K. pneumonia isolated from different clinical cases and from several hospitals in Baghdad were 32% and 84 against Ofloxacin Cefotaxime respectively. It is also consistent with Zedan-ALobadi study whose studied the resistance of K. pneumonia, isolated from several hospitals in Baghdad, against various antibiotics; it was revealed that the resistance rate was 2.5% for Imipenem, 95% for Piperacillin, 97% for Ampicillin, and 7.5 for Trimethoprim.

   The genetic relationship was determined by genotyping of the studied bacteria using the Enterobacterial Repetitive Intergenic Consensus (ERIC) method. The results of the current study showed the presence of a genetic relationship between K pneumoniaea isolates and also the presence of 12 genotype; the molecular weight of these bundles ranged between (100-1000) base pair as shown in Table (1). Furthermore, the results as shown in Figure (3) found the presence of two clones, each of which contains similar genotypes and found between them a genetic affinity, while the rest of the isolates contain different genotypes. The first clone contained three isolates (3, 5, 8) isolated from hospitalized patients in Al-Yarmouk Teaching Hospital in Baghdad, and from the patients with urinary tract infection. Additionally, these isolates also showed high resistance to antibiotics including Ampicillin, Cefotaxime, and Piperacilli. While the second clone contained four isolates (8, 9, 5 and 6) and these isolates were with a genetic affinity.

Moreover, these isolated showed high resistance to antibiotics and showed sensitivity to Imipenem. Thus, the genotyping method is important in the field of finding...
the genetic relationship, determining its resistance and sensitivity to antibiotics, and determining the most pathogenic strain. The results of this study is in agreement with the findings of Mehr et al. (2017) which found that there are 12 genotype of *K. pneumoniae* isolates using ERIC-PCR method. While it is inconsistent with the findings of Wasfi et al. (2016) study which detected 21 genotype of *K. pneumoniae* using ERIC-PCR method.

**Figure (1):** The resistance of *Klebsiella pneumoniae* to various antibiotics

Ampicillin (AM), Cefotaxime (CTX), Piperacillin (PRL), Sulfamethoxazole + Trimethoprim (SXT), Gentamycin (GEN), Ciprofloxacin (CIP), Azithromycin (AZM), Ofloxacin (OFX), Chloramphenicol (CHL), Imipenem (IMP).

**Figure (2):** Electrophoresis of PCR product of isolates of *K. pneumoniae* using a specific primers for ERIC genotyping (100-1500 base pairs) on agarose gel (2%) and with voltage difference of 100V for 80 minutes.
Table (1): The Molecular weights and percentages of bundles as products for ERIC-PCR method

<table>
<thead>
<tr>
<th>Bundles</th>
<th>The molecular weight (bp)</th>
<th>No. of isolates</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERIC1</td>
<td>100</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>ERIC2</td>
<td>200</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>ERIC3</td>
<td>250</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>ERIC4</td>
<td>300</td>
<td>7</td>
<td>35</td>
</tr>
<tr>
<td>ERIC5</td>
<td>350</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>ERIC6</td>
<td>400</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>ERIC7</td>
<td>500</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>ERIC8</td>
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</tr>
<tr>
<td>ERIC9</td>
<td>700</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>ERIC10</td>
<td>800</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>ERIC11</td>
<td>900</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>ERIC12</td>
<td>1000</td>
<td>2</td>
<td>10</td>
</tr>
</tbody>
</table>

Figure (3): Dendogram of *K. pneumonia* isolates using Past Jaccard/up GMA program.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Ministry of Education and all experiments were carried out in accordance with approved guidelines.

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Psychological Burden of Caregivers of Children with Cancer at AL-Amal Hospital in Baghdad City

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Abstract

Objectives: To assess psychological burden of caregivers of child with cancer at Al-Amal Hospital in Baghdad City.

Method: Descriptive study conducted among 50 caregivers, they are using self-administration method to answer the psychological burden items. The data collection started from October 7th 2019 to March 9th 2020 at Al-Amal Hospital in Baghdad city.

Results: 50% of caregivers had moderate level of psychological burden and 44% had severe level of psychological burden. The grand mean was (2.21) at moderate level of assessment. There is no significant relationship between the caregivers psychological burden and their general information at P-value 0.05.

Conclusion: the caregiver had moderate to severe psychological burden due to caring child with cancer. They are need for psychological support.

Keywords: Psychological Burden, Caregivers, Children, Cancer.

Introduction

Cancer is expected to rank as the leading cause of death and the single most important barrier to increasing life expectancy in every country of the world in the 21st century. According to estimates from the World Health Organization (WHO) in 2015, cancer is the first or second leading cause of death before age 70 years in 91 of 172 countries, and it ranks third or fourth in an additional 22 countries.‘Burden’ may be defined as a multidimensional concept with objective and subjective components. ‘Objective burden’ is defined as specific happenings and activities related to caregiving, for instance, financial problems or personal activity limitations. ‘Subjective burden’, on the other hand, encompasses affective responses to the caregiver experience, such as feelings and emotions related to fear, strain and guilt. Family caregivers (FCs) are a pivotal source for quality of life, well-being and quality of care in terminally ill patients. However, they are also affected by caring for the patient and may thus be affected by significant physical and psychosocial burden. Psychosocial burden and anxiety are associated with the number of unmet needs in FCs of advanced cancer patients. Frequently unmet needs of FCs relate to information on caregiving and care planning, support in managing fear as the patient’s physical or psychological status declines, and preparing for the patient’s death and their own bereavement. Supportive needs can be summarized in four main categories: needs concerning the patient’s well-being, transfer of information, practical problems of caregiving, and emotional support. Some studies suggest that FCs’ needs might be better addressed if specialized palliative care is included during home or hospital care. In addition, FCs’ quality of life has been shown to be higher in patients receiving care in palliative care facilities rather than in acute care hospitals. Cancer is a family experience, and often family members have as many problems coping with it as does the diagnosed patient. The family goes through different stages of adjusting to the disease. The emotional reactions may include anger, resentment, guilt and adjustment pain, and may or may not lead to the acceptance of the disease. The cancer’s diagnosis, as well as the subsequent phases of the disease and its treatment, may be a source of intense stress both for the patient and for the family. Patients and their relatives need to
face the challenge of a life defined with uncertainty; treatment routines, the threat of recurrence or the failure of the treatment.\(^{(4)}\)

Caring for a child with cancer can be profoundly distressing to parents and in turn, parental psychological distress (PD) can affect child and sibling wellbeing. Caring for a child with advanced cancer is likely to be even more distressing, yet very few prospective studies have evaluated parent PD among these families. Understanding the degree of PD and contributing factors among parents with children with advanced cancer has the potential to better enable clinicians to identify higher risk families and optimize outcomes.\(^{(5)}\)

Family caregivers often feel overloaded with the additional obligations and roles they have to pick up. They find it increasingly burdening to care full-time for the household and provide emotional support for the patient. The family’s problems and the way family members regard the disease may be also a result of the family system they are in.\(^{(6)}\)

The role of a family in the course of cancer changes according to the needs of the patient and the cancer’s phase. In the diagnosis phase, depending on the type of family, a big mobilization, with readiness to give support to the patient, is observed. Family members try to get information about the diagnosis, treatment and chances of survival. Other family types may avoid talking about the cancer to avoid creating an additional stress for the patient. Also, very often both the patient and family members try to search for the reasons for the sickness. Looking to find some sense in the universe is a very common tendency, which results from the conviction that everything in the world has its place and reason. Depending on the family’s coping style, if it is a task concentrated family, attitude towards the sickness may promote healthy behavior or strengthen the will of the patient to fight.\(^{(7)}\)

Taking care of a sick patient, most caregivers share some common needs which unfortunately are not always possible to be fulfilled. All of them have a need for information, for feeling close to and needed by the patient, and to have a chance to get external support whereby they can speak about their own problems – to ‘ventilate’ their emotions.\(^{(8)}\)

**Method**

Descriptive study design was conducted to assess psychological burden of care givers of child with cancer at Al-Amal Hospital. The data collection started from October 7th 2019 to March, 9th 2020 at Al-Amal Hospital in Baghdad city. The study carried among 50 caregivers selected by a non-probability (purposive sample). The study tool was used constructed questionnaire tool psychological burden of care givers of child with cancer. The questionnaire consists of two parts:- Demographic data of sample composed of (5) items that represent the sample demographic data such Age, gender, level of Education, relative to the child and socio economic status and the psychological burden consisted from 14 items constructed to measure the phenomena, rating and scoring according to 3 likert scale answered by 3 key answer always (3), sometimes (2) and never (1), which assessed by cutoff point (0.66) due to scores (1, 2 and 3) respectively. level of assessment: (1-1.66) = low = L, (1.67-2.33) = moderate = M, (2.34-3.00) = severe = S. The data collected after taken the sample agreement to participate in the study and using self-administration method to gathering data. The data analysis by using descriptive and inferential data analysis (SPSS version 20).

**Results**

**Table (1): Distribution of the study sample by their general information**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19-28</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>29-38</td>
<td>14</td>
<td>28</td>
</tr>
<tr>
<td>39-48</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>49 and more</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
This table shows that 36% of them at age 39-48 years old. 56% of them were females. 36% of them were elementary school graduated. 44% of them were fathers and mothers of children. 42% of them had barely sufficient of socio economic status.

### Table (2): Distribution of the psychological burden of caregivers

<table>
<thead>
<tr>
<th>No</th>
<th>Items</th>
<th>Always</th>
<th>Some times</th>
<th>Never</th>
<th>Mean</th>
<th>Ass.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>We got insomnia because of our affected child</td>
<td>25</td>
<td>17</td>
<td>8</td>
<td>2.34</td>
<td>S</td>
</tr>
<tr>
<td>2</td>
<td>We feel guilty especially when our child suffers from the disease</td>
<td>30</td>
<td>16</td>
<td>4</td>
<td>2.52</td>
<td>S</td>
</tr>
<tr>
<td>3</td>
<td>We have a desire to cry because of the disease of our affected child</td>
<td>21</td>
<td>17</td>
<td>12</td>
<td>2.18</td>
<td>M</td>
</tr>
<tr>
<td>4</td>
<td>We are scared about the future of our affected child</td>
<td>19</td>
<td>16</td>
<td>15</td>
<td>2.08</td>
<td>M</td>
</tr>
<tr>
<td>5</td>
<td>We are hopeless that our child getting cured</td>
<td>5</td>
<td>13</td>
<td>32</td>
<td>1.46</td>
<td>L</td>
</tr>
<tr>
<td>6</td>
<td>We panic when heard about death of other affected child</td>
<td>11</td>
<td>8</td>
<td>31</td>
<td>1.60</td>
<td>L</td>
</tr>
<tr>
<td>7</td>
<td>We are hesitated from having other children because of the disease</td>
<td>42</td>
<td>8</td>
<td>-</td>
<td>2.84</td>
<td>S</td>
</tr>
<tr>
<td>8</td>
<td>We feel despair of our child because he could not share playing with his mates</td>
<td>20</td>
<td>17</td>
<td>13</td>
<td>2.14</td>
<td>M</td>
</tr>
<tr>
<td>9</td>
<td>We feel incomplete because of the disease</td>
<td>34</td>
<td>10</td>
<td>6</td>
<td>2.56</td>
<td>S</td>
</tr>
<tr>
<td>10</td>
<td>We feel despair of our child because he has to keep away for long times from his mates</td>
<td>20</td>
<td>18</td>
<td>12</td>
<td>2.16</td>
<td>M</td>
</tr>
<tr>
<td>11</td>
<td>We feel pain for his long time of because from school because of his disease</td>
<td>18</td>
<td>15</td>
<td>17</td>
<td>2.02</td>
<td>M</td>
</tr>
<tr>
<td>12</td>
<td>We feel pain because of his growth retardation because of the disease</td>
<td>18</td>
<td>14</td>
<td>18</td>
<td>2.00</td>
<td>M</td>
</tr>
<tr>
<td>13</td>
<td>We feel grief on our affected child because of his deformity of shape by the disease</td>
<td>39</td>
<td>8</td>
<td>3</td>
<td>2.72</td>
<td>S</td>
</tr>
<tr>
<td>14</td>
<td>We feel pain when we see our child not able to eat all types of food</td>
<td>30</td>
<td>11</td>
<td>9</td>
<td>2.42</td>
<td>S</td>
</tr>
</tbody>
</table>

**Grand mean** 2.21  
**Assessment** Moderate

M= Mean, Ass.= Assessment, level of assessment: (1-1.66) = Low = L, (1.67-2.33) = Moderate = M, (2.34-3.00) = Severe = S
This table shows that when the caregivers response to the burden questionnaire, they had moderate psychological burden the grand mean was (2.21) at moderate level of assessment.

This table shows that 50% of caregivers had moderate level of psychological burden and 44% had severe level of psychological burden

<table>
<thead>
<tr>
<th>Level of Burden</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low level (1-1.66)</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Moderate level (1.67-2.33)</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>Severe level (2.34-3)</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

There is no significant relationship between the caregivers psychological burden and their general information at P-value 0.05.

**Conclusion**

Parenting a child with advanced cancer is strongly associated with moderate to severe levels of psychological burden. Interventions aimed at aligning prognostic understanding with concrete care goals, and easing child suffering and financial hardship may mitigate parental psychological burden. Suggestions for further research are presented to support efficient psychosocial interventions and minimize the psychosocial problem experienced by pediatric caregivers over the course of onco-hematological treatments.
Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the AL Zahrawi College University and all experiments were carried out in accordance with approved guidelines.

References


Histopathological Grading and Enzyme Histochemical Study of the Placenta in Gestational Diabetes Mellitus Pregnant Women

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Abstract

Gestational diabetes mellitus (GDM) constitutes carbohydrate metabolism disorders that lead to severe and sometimes life-threatening complications of pregnancy.

Materials and Method: 40 placenta biopsies with blood samples were taken from gestational diabetic pregnant women and 20 placenta biopsies with blood samples were taken from healthy pregnant women, the tissues were fixed, processed, embedded and cutting separately depending on procedure for enzyme histochemical and routine histological technique and the blood was centrifuged.

Results: The histological changes in the GDM group represented by villous oedema in approximately (30%) of the GDM group, an excessive amount of collagen fibres in the villous stroma (57.5%). Syncytial knots were formed (70 %) in addition to an excessive number of cytotrophoblast cells in about (65 %). The stromal fibrinoid deposition was noticed in (52.5 %). Hypo-vascular villi are seen in (32.5%) also, atherosis of the uteroplacental arteries in (40%) of biopsies. In enzyme histochemistry, the villous stroma of the GDM group has a strong reaction to the G-6-P enzyme. There is a significant increase (p<0.05) in serum blood sugar, cholesterol, blood urea in the GDM group when compared with the normoglycemic group.

Conclusions: The increment of serum blood sugar caused histological and enzyme histochemical alteration during pregnancies.

Keywords: Gestational Diabetes Mellitus, placenta, Histopathological, Enzyme histochemical.

Introduction

Gestational diabetes mellitus (GDM) is defined as a condition of glucose intolerance that appears during pregnancy1. This type of diabetes accompanies the pregnancy period and disappears after birth. It is a medical complication that affects about 3-10% of pregnant women, and it appears more in women with a family history of the disease.2

Diabetes occurs during the second trimester of pregnancy 3, but most of it occurs in the third trimester of pregnancy, as the mother is likely to develop diabetes after childbirth, especially type-2 diabetes mellitus 4. The causes of GDM in some women are not known in a specific way, but there are contributing factors in the occurrence of the disease, including the interference of the hormones required by the fetus’s growth that is an obstacle to the work of insulin 5, and that weight gain may lead to increased insulin resistance and insulin resistance will deprive the fetus of the benefit of the effect of insulin product 6. The placenta during pregnancy produces...
additional amounts of the hormone (Cortisol) and other hormones that are anti-insulin, such as progesterone and human chorionic gonadotrophin and the human placental lactogen. All of these hormones increase the level of glucose in beta cells. Beta-cells in the pancreas is unable to produce sufficient amounts of insulin to offset this increase in the level of glucose or there was insulin resistance by the mother (Maternal insulin resistance) as this increases the possibility of a case of excess glucose in the pregnant mother (Hyperglycemia) or what it is called GDM. The incidence of complications of GDM in Iraq has increased dramatically in recent years and the health importance of pregnant women and the complications that occur during pregnancy.

The current study aimed to identify some of the histopathological, enzyme histochemical and biochemical changes accompanying these complications.

**Materials and Method**

**Study Samples:** The 60 placenta tissue and blood samples were obtained for pregnant women from Baghdad Teaching Hospital and based on the medical diagnosis by the gynaecologist. A questionnaire was completed containing much information about the pregnant woman, the diseases she had during pregnancy and the laboratory tests that were performed. The women under study were divided into two groups: The first group of 40 pregnant women with GDM, age ranging from 20-43 years. The second group 20 normoglycemic pregnant women, age ranging from 18-40 years.

**Tissues Collection:** Placental tissue biopsies were collected and dissected from the central part of the placental bed after normal vaginal deliveries or caesarian section and prepared for histopathological and enzyme histochemical analysis as follows:

The fragments for the histopathological study were then immediately fixed in formalin 10%, dehydrated in a graded ethanol sequence and embedded in paraffin according to a standard protocol, sectioned at 5 μm and installed for the staining with Hematoxylin-Eosin (H & E) on glass slides and examined under the microscope. The fragments for enzyme histochemical study were then immediately fixed and dehydrated in a mixture of equal volumes of cold acetone and absolute alcohol for 24 hours for demonstration of Glucose-6-Phosphatase (G-6-Pase) were based on the modified procedure described by 11.

**Blood Samples Collection:** The 5 ml of venous blood was drawn for each of the women from the study groups, the blood was placed in a test tube and left at laboratory temperature 15-25 ° C until the thrombus was formed, then the thrombus was separated by the centrifuge at 3000 rpm for five minutes, a serum was withdrawn and preserved - 20 ° C until laboratory tests.

**Biochemical test:** Serum Glucose, Cholesterol and Urea were determined by an enzymatic method with the commercially available kit (Randox).

**Statistical Analysis:** All results are expressed as Mean values ± Standard Deviation or as N (%). For computation, we used the SPSS program version 25 for Windows (SPSS Inc., Chicago, IL, USA) software package. Differences were considered as significant if p< 0.05.

**Results and Discussion**

**A-Placental tissues:** Placental tissue from normoglycemic, chorionic villi test appeared as vascular villous stroma surrounded by multinucleated syncytiotrophoblastic layer with indistinct cell borders and darkly stained nuclei. Very rarely we have been able to distinguish villous cytotrophoblastic cells that behave as ovoid, greatly variable in thickness, with well-defined cell borders and light cytoplasm staining. The villous stroma consisted of a core of connective tissue that had several bundles of collagen fibres and flattened fibroblasts. There were 2-5 dilated capillaries lined with fetal blood in the villous stroma (Fig. 1A & B).
All the placenta obtained from the two groups were stained with H & E histological stain. On examination of these sections with a light microscope, our result recognized several histological changes with different proportions. These changes are listed in (Table -1) as following:

Villous oedema was easily seen in the placenta stained, it was seen in 12 placentae (30%) of the GDM group. However, we couldn’t find placentae with villous oedema in the normoglycemic group, (Fig. 2A). Other studies found that one of the pathological features of placentae in hyperglycemic pregnant women is villous oedema\(^1\). The intervillous distance was of various extent, but some of the distance was vast when compared with normal placentae resulting from intervillous oedema with the increased amount of fibrinoid\(^6\)

On the other hand, an excessive amount of collagen fibres in the stroma of the villi was easily demonstrated, stromal fibrosis was observed in 2 placentae (10%) of the normoglycemic group, but increased up to 23 placentae (57.5%) from GDM group, (Fig. 2B). This results matched with other studies that observed a histological change in GDM placenta represented by stromal fibrosis\(^6\)

Syncytial knots were formed in more than one-third of the examined villi, in 28 placentae (70%) from the GDM group. However, this deviation from the normoglycemic group was noticed only in 4 placentae (20%) (Fig. 2C). More than previous paper observed Syncytial knots in placenta of GDM pregnant women \(^6,13\). Immoderate forming Syncytial knots is a relationship with placental pathology, and a knotting indicator is employed to estimate riskiness\(^14\).

In GDM group cases an excessive number of cytotrophoblast cells have been frequently observed. This change was observed in the normoglycemic group in only 2 placentae (10%), in the GDM group in 26 placentae (65%). El Sawy et al \(^6\) and other study\(^15\) confirm that one of indicator of placenta tissue of GDM pregnant is cytotrophoblast cells proliferation\(^6\).

Stromal fibrinoid deposition affecting of the villi was observed in the normoglycemic group 4 placenta (20%). Although it was found in 21 placentae (52.5%) in placentae obtained from the GDM group, (Fig. 2D). Another study confirms that the morphological feature of villous tissue in GDM of women is fibrin deposit\(^13\). Hypo-vascular villi are seen in 3 placentae (15%) of the normoglycemic group and 13 placentae (32.5%) of the GDM group, (Fig. 2E). A study on placenta tissue in hyperglycemic pregnancy noticed alterations in vascularity repeating by surprisingly hypovascular and these had a smaller diameter and show a wavy course compared with normal villi.\(^16\) Also, atherosis of the uteroplacental arteries appears as multiple foamy cells within the walls of the vessels. It was seen only in one placenta from the normoglycemic group (5%), and in 16 placenta (40%) from the GDM group, (Fig. 2F). A study found that placental atherosclerosis occurred in 28.94% of the group with GDM compared to 10.52% of the group with normoglycemic pregnancy\(^17\).

Figure (1): Light microscopical appearance of normoglycemic pregnant women placenta showing microvilli (V) with narrow intervillous spaces (IS) and syncytial knots (head arrows). The villous stroma (VS) shows blood vessels (arrows) containing blood cells, (A & B: H & E staining, X10).
Table 1: Histological grading of placental tissues in GDM and normoglycemic groups

<table>
<thead>
<tr>
<th>Histological finding</th>
<th>Normoglycemic group N = 20 (%)</th>
<th>GDM group N = 40 (%)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Villous edema</td>
<td>0 (0 %)</td>
<td>12 (30 %)</td>
<td>0.01</td>
</tr>
<tr>
<td>Stromal fibrosis</td>
<td>2 (10 %)</td>
<td>23 (57.5 %)</td>
<td>0.01</td>
</tr>
<tr>
<td>Syncytial knots</td>
<td>4 (20 %)</td>
<td>28 (70 %)</td>
<td>0.01</td>
</tr>
<tr>
<td>Cytotrophoblastic cell hyperplasia</td>
<td>2 (10 %)</td>
<td>26 (65 %)</td>
<td>0.01</td>
</tr>
<tr>
<td>Fibrinoid deposition</td>
<td>4 (20 %)</td>
<td>21 (52.5 %)</td>
<td>0.01</td>
</tr>
<tr>
<td>Hypo-vascular villi</td>
<td>3 (15 %)</td>
<td>13 (32.5 %)</td>
<td>0.01</td>
</tr>
<tr>
<td>Atherosis of uteroplacental vessels</td>
<td>1 (5 %)</td>
<td>16 (40 %)</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Figure (2): Light microscopical appearance of GDM placenta showing, (A): Villous oedema (B): stromal fibrosis (red arrows), (C): Syncytial knots (red arrows), (D): Fibrinoid deposition (black arrows), (E): Hypo-vascular villi (red arrows), (F): Atherosis of uteroplacental vessels (A & B: H & E X10).
B-Enzyme histochemical of Glucose–6-phosphatase: The placental tissues acquired from normoglycemic women or other maternal disorders exhibiting a weak reaction to the enzyme G-6-Pase (Fig. 3A & B). The villous stroma showed more dense activity to the G-6-Pase (Fig. 3C & D), while the trophoblastic showed moderate activity to G-6-Pase in the placental tissue of GDM pregnancy (Fig. 3E & F). The G-6-Pase plays the important role of supporting glucose during starvation, an enzyme product mainly in the kidney and the18. The moderate reactive with normoglycemic proof that it presents in the placenta and this was in a match with other studies that detect the G-6-Pase histochemically in the syncytiotrophoblasts of the placent19. In our study we found that there is a strong activity of the enzyme in hyperglycemic tissue, the previous result confirms that by documentation 2-3 fold increasing the activity of G-6-Pase in the liver of diabetic20. G-6-Pase is an enzyme that analysis Glucose 6-phosphate, lead to the formation of a free glucose and phosphate group.21 When the activity of G-6-Pase increases, free glucose also increases and our results from the increased blood sugar in hyperglycemic pregnancy supporting these results.

Figure (3): The light microscopical appearance of placental tissue: A & B obtained from normoglycemic showing a weak reaction to the G-6-Pase (arrows), C & D: strong reaction to the G-6-Pase in syncytiotrophoblast (red arrows) and cytotrophoblast cells, E & F: moderate reaction to the G-6-Pase, in placenta GDM(G-6-Pase, X10).

C-Biochemical study: The serum level of glucose for both healthy pregnant women and GDM pregnancy is shown in (Table -2). A significant (p<0.05) increase is found in the mean value of the glucose in GDM pregnancy (173.82±2.47 mg/dl) compared with that of the healthy pregnancy (84.04±2.3 mg/dl).

High glucose or diabetes during pregnancy may be caused by a decrease or resistance to the hormone insulin by placenta hormones such as progesterone or human placental lactogen, or as a result of the increase in the secretion of the hormone cortisol that occurs during pregnancy(22,23). Jansson et al24 showed that the high level of glucose from its normal level leads to an increase in its transmission to the placenta. Also, the imbalances in carbohydrate metabolism during pregnancy lead to many complications for the mother25.
While the serum cholesterol level is found to be significantly ($p<0.05$) increased in the mean of GDM pregnancy when compared with that of a healthy pregnancy. Table (2) showed the mean of GDM pregnancy to be (224.50±7.68 mg/dl), while in a healthy pregnancy is (184.80±4.34 mg/dl). The increase of total cholesterol level in the serum of women with GDM in the current study supports the results study of Quinlivan and Lam, and its rise can be attributed to the occurrence of a disorder of fat metabolism (Dyslipidemia) as a result of the disease. Several studies have shown approaches during the and beyond the pregnancy, adverse metabolic consequences of diabetes.

Recently, the high levels of cholesterol can cause atherosclerosis, research has shown that low density lipoprotein cholestrol LDL-C is not the only type of cholesterol that increases the risk of atherosclerosis, and that any non-HDL-C cholesterol, such as very-low-density lipoprotein cholesterol (VLDL-C) and apolipoprotein B, that increase that risk. Study of Ryckman et al. found that women with previous GDM Insulin resistance elevate the VLDL-C abnormalities contained in non-high-density lipoprotein cholesterol (HDL-C) along with (LDL-C) and lipoprotein of intermediate density.

Recently, blood urea has been documented to be associated with diabetes mellitus(DM), commonly regarded as one of the markers of kidney functions. On the one hand, (DM) cause kidney disease, and on the other hand, kidney disease may increase the risk of (DM), including urea or other uraemic elements. Our result showed the level of serum urea shows an increase in GDM pregnancy as compared with a healthy pregnancy, (Table 2). The mean value of serum urea in GDM pregnancy is found to be (28.12±1.06 mg/dl), and in a healthy pregnancy is (21.5±1.2 mg/dl). Statistically, there is a significant ($p<0.05$) difference between the two groups.

This result is consistent with many researchers who indicated that the GDM condition leads to a rise in the level of urea in the blood serum, and this rise is due to the physiological change as a result of the pathological condition which leads to a decrease in the rate of glomerular filtration rate (GFR). This causes a rise in the level of urea in the blood serum.

### Table-2: Serum Glucose, Cholesterol and Urea level in GDM and Normoglycemic women.

<table>
<thead>
<tr>
<th>Study Groups</th>
<th>Glucose (mg/dl)</th>
<th>Cholesterol (mg/dl)</th>
<th>Urea (mg/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant women with GDM</td>
<td>173.82±2.47</td>
<td>224.50±7.68</td>
<td>28.12±1.06</td>
</tr>
<tr>
<td>Normoglycemic women</td>
<td>84.04±2.3</td>
<td>184.80±4.34</td>
<td>21.5±1.2</td>
</tr>
</tbody>
</table>

### Conclusions

The hyperglycemia during pregnancy leads to the serious histological changes in placentae representing by oedema in stromal villi, fibrinoid deposition, hypovascular, atherosis of uteroplacental arteries. The villous stroma showed more dense activity to the G-6-P enzyme that indicates to increase the sugar content in it and the study found a strong relationship between hyperglycemia during pregnancy and the rise of serum cholesterol and urea in blood serum.

### Ethical Clearance:

This study was agreed by the Ethics and Research Committee of the Baghdad Teaching Hospital, Medical city, Bagdad,Iraq.

### Source of Funding:

This research was not funded by association.

### Conflict of Interest:

None

### References


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The Characteristics of Abortion Liability by Doctor in Indonesia after Enactment of Health Law 2009

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Abstract

This study analyzed the characteristics of abortion liability by doctor after the promulgation of health law year 2009 in Indonesia. The result found that the pregnancies that are legal to be aborted are: those dangers for the mother concerned (for life saving), womb that's the foetus is heavy handicap and the pregnancy because of rape (until 6 weeks of pregnancy), but for the doctor who performed abortion to help the mother who has failed in her family planning method or the idiot women who pregnanted by unknown man and pregnancies because rape but more than 6 weeks of old must be held accountable for his action. The liability is including criminal liability, civil liability, administrative liability, professional discipline liability and ethical liability. For the criminal liability, can be use criminal code as a “ius generals” or the article 194 of health law as a “ius spesialis” This characteristics of abortion liability for the doctor will prohibit the doctor who help someone who need performing of abortion because of: failing of family planning method, idiot woman that pregnanted by unknown man and pregnant woman because of rape more than 6 weeks. This reason is not for pregnancy that caused by promiscuity and immoral habits.

Keywords: Abortion liability, doctor in Indonesia, Health Law of 2009.

Introduction

Data from the World Health Organization in 2018, there are 21.6 million women worldwide undergoing illegal abortions every year. Of these, 18.5 million of them occur in developing countries. In Southeast Asia, deaths caused by unsafe abortion account for 14-16% of all maternal deaths. Indonesia which is around 2.3 million per year, is sufficient to prove that abortion is not a problem that can be underestimated, because abortion is one of the causes of the high mortality rate for pregnant women in addition to other factors. Abortion that is fatal, especially if it is worst because of complications, which are caused by bleeding or infection. Maternal mortality due to illegal abortion contributed 5.6% of total maternal mortality cases. Don Marquest in Bonnie Steinbock says that abortion is considered immoral, because the fetus in womb is the same as a living human. However, there are some views that say that it is okay to have an abortion because the fetus is not yet considered a human. Therefore, abortion that is illegal and not in accordance with medical method is still ongoing and remains a major problem that threatens women during their reproductive years. In addition, because abortion is considered illegal and prohibited by religion, people hide the incidence of abortion and handle it with non-medical assistance/traditional healers, who use improper method. In Mexico, change that is occurring is the increased use of misoprostol as a method of abortion. Misoprostol was originally developed to prevent gastric ulcers but its off-label use as an abortifacient drug has become known worldwide as an effective way to end a pregnancy. The other situation, where people can easily get drugs or herbs that are sold freely and promise to have an abortion, at affordable prices. Conclusion of Latt et All study demonstrates that maternal mortality is lower when abortion laws are less restrictive.

Many events in society need the attention, because health concerns affect all aspects of life and have a broad and complex scope. Where does a mother who has failed in family planning program ang become pregnant, have to complain? Actually, due to economic reasons, she was unable to increase the burden on the family with her pregnancy. Another problem that has been encountered, where a young woman with a retardation mental experiences rape and becomes pregnant without knowing who is the biologic husband. They are
victims of a system, as v. Boven stated that victims are individuals who or have suffered loss, including physical or mental injury, emotional suffering, economic loss or actual deprivation of their basic rights, either by action or by negligence. This tendency to have an abortion cannot be separated from the view of the nature of when the life of a human child begins. Abortion is a complex problem, covering religious, ethical, moral and scientific values, as well as specifically as a biological problem. In a debate about termination of early pregnancy, there are words that are considered important, namely: life, potential life and alive. From this each word, we can think, must we accept the liability when we do it.

Liability: Legal liability is a concept of legal responsibility. A person who is legally responsible for a certain act can be subject to a sanction in the case of his actions which are contrary/contrary to the law. Sanctions imposed for one’s own actions that hold the person responsible. the subject of responsibility and the subject of legal obligation are the same. According to Titik Triwulan, accountability must have a basis, namely things that cause legal rights for someone to sue others, as well as things that give birth to other people’s legal obligations to give their accountability.

The basic principle of responsibility on the basis of mistakes means that a person must be responsible because he or she has done something wrong that harms others. Legal accountability is always required for all persons in a country of law for their actions, including a doctor who performs his actions, including abortion. Accountability here means that the doctor must be ready in case of a lawsuit against him, whether criminal, civil or administrative, beside from ethical and professional problems.

Why should you be responsible if you don’t harm other people and society can accept it? Maybe ethics is still argued and evidence base medicine is violated, including religion rejects or approves it. Considering the needs of the community, it is necessary to conduct separate sociological research. Not all religions refuse it, of course, by considering special circumstances. According to John J. Donohue III And Steven D. Levitt in their study, teenagers, unmarried women, and poor women are most likely to deem a pregnancy to be either mistimed or unwanted, and that a large proportion of these unintended pregnancies will be terminated through abortion.

Criminal Liability: In criminal liability, it must meet 3 (three) requirements: a. There must be criminal action, which is included in the legal delic formula; b. The act that can be sentenced should be contrary to the law, and c. There must be an offence from the perpetrator. It is obvious that a person can be held accountable if there are elements: an act that is against the law, able to be responsible, the existence of errors (schuld) in the form of intentional (dolus) or because of forgetfulness (culpa), as well as the absence of justification reason or excuse reason.

Accountability or known as the concept of “liability” in terms of legal philosophy, it is as stated by a great 20th-century philosopher, Roscoe Pound which stated that the accountability does not only concern the legal matter. However, there is also a problem of moral values or morality in the life of people. Criminal liability According to Roscoe Pond, is as an obligation to pay the retaliation that the perpetrator will receive from someone who is harmed. The responsibility is not only about the legal matter, but the problem of moral values or morality in a society. S.R. Sianturi says the criminal liability is intended to determine whether or not the person can be asked to take responsibility for his or her own actions.

Doctor’s accountability to the Illegal Abortion, if analyzed by the accountability theory of Roscoe Pound is very relevant, because the doctor in taking the abortion action should be responsible to the person who is harmed in this case is the patient who is experiencing the act of abortion, which concerns moral, and morality in the community. In the Sianturi theory of abortion, the abortion itself is a criminal offence. The Doctor who does the abortion means committing a criminal offence. Abortion is a meaningful source of controversy, but some do not cause a killer stigma for the culprit. So, this abortion is a view of life that must be fought from human life.

According to Sianturi, it’s not everyone who performs actions belonging to the category of criminal acts is to be convicted. So, the Doctor who does the abortion clearly commit a criminal offence can be sentenced to or cannot be convicted. The doctor will be convicted if the criminal act of abortion is fulfilled by the criminal act, against the law and making offence. For doctors who have an abortion in pregnant women who are experiencing medical emergency and are aiming to save his life, there is no element against the law, so after the enactment of health law Year 2009, the doctor...
cannot be punished because of his abortion performed. Likewise, in the act of abortion committed to pregnancy, where the fetus suffers from severe genetic defects that will not be able to live independently after birth, also in pregnancy due to rape cannot be sentenced because there is no element against the law.

The criminal threat in the health law of 2009 for abortion is contained in section 194, which states a criminal threat to those who perform abortion acts, that any person who intentionally commits an abortion does not conform to the provisions referred to in article 75 clause (2) will be sentenced to imprisonment of 10 years and the most fines of Rp. 1 billion, -(1 billion). So, the criminal liability of doctors who do abortion is not in accordance with the allowable in article 75 and 76 the health law will be threatened with article 194. This is if the judge uses lex specialist that is this health law. A pregnant woman who will be aborted, is required to obtain her husband’s approval (according to law number 36-year 2009 on health, section 76). Problems arise when the husband does not give consent in this situation! In the case of abortion in the criminal code, the criminal liability of the physician who did the abortion is in accordance with article 349, which will get the threat of a third more severe than the layman who did. In the case of abortion by everyone, it should also be remembered Article 299 of the criminal code. Although the intention will not disbelieve, but with the administration of the drug followed by the provision of hope for the occurrence of abortion, then if there is actually a miscarriage, this drug provider can be sentenced.

In Indonesia, criminal code is “lex generalis” and health law year 2009 is “lex specialis”, so that the judge will certainly choose health Law year 2009 in accordance with the principle of “lex specialis derigate Lexi generali”, but may be considered also the chapters in this psnsl code because it is more detailed. It was the authority of the judge to decide. Criminal liability for doctors who have abortions in women with the failure of the family planning program or in women with a mental retardation that is pregnant due to rape, the doctor has not been protected, so it is still considered illegal so that it can be ensnared with the criminal code or health law.

Legal enforcement of doctors who have illegal abortion can be performed in accordance with the criminal proceedings in general. First of all, will be conducted investigations by police, whether the event reported is correct. If this is true, then it can be upgraded to an investigation and then prosecuting by prosecutors and subsequent proceedings in court. Once there is a decision of the judge, the judgment will be executed by the prosecutor.

**Civil Liability:** The Abortion performing generally is an action of agreement between 2 persons/parties, it is unlikely that the patient will sue because of the things done mutually beneficial. But if there are complications that harm the patient, certainly does not close the possibility of the patient or his family will sue the doctor. The legal relationship between a physician and a patient in performing the abortion may be an alliance born due to a treaty, but it is generally a treaty under the hands, either written or orally. The reason why it usually an under-hand agreement is: a. On illegal abortions are unlikely to carry out authentic agreements, b. Usually until abortion, many of these cases of abortion are considered disgraceful of the family.

Although this agreement is a treaty under the hands, if the patient is harmed, he or she can sue his doctor for compensation. This can happen to a legally occurring abortion. The agreement between the doctor and the patient on an illegal abortion is actually invalid, because according to article 1320 Civil Law, the agreement must be fulfilled 4 conditions, where the 4th condition is the agreed condition must be something “halal” (that does not break the law), when the abortion is illegal, so it is not lawful or violate existing laws and regulations. In the act of legal abortion, doctors are also allowed to be sued for tort, for example if complications resulting from unfulfilled implementation of the standards of service, professional standards and standards of operating procedures, as well as medical discipline and medical ethics. It is based on article 1339 Civil Code.

Under the provisions of article 1339 of the Civil Code, then all liabilities and prohibitions that constitute the compliance and customs in the medical world become part of the therapeutic agreement. Thus, if a civil dispute arises between a physician and a patient, that is, because the Doctor is deemed by the patient to have not carried out its obligations as determined by the unawareness and/or customs prevailing in the medical world, in the relationship of doctors with the patient, then the one that is referenced is customs prevailing in the medical world.

Civil litigation can originate from both the patient and the family. This lawsuit is threaded “materii” and “immaterial”, it can be proposed if the patient
or his family feel harmed. In Materiil claims, it can be estimated and calculated the number of claims in advance, albeit only in an outline. While a lawsuit that is Imateriil is usually very large in number, because it is often associated with things that are not very related directly with the abortion itself.

The civil liability for this abortion can be resolved both litigation and non-litigation. For settlement by way of litigation means completion by court. This can take a long time and require great expense. While non-litigation settlements can be mediation. Settlement of disputes with mediation can be done in court or out of court. According to Regulation of Supreme Court Number 1 of 2008 updated with Regulation of Supreme Court Number 1 of 2016, civil matters are expected to be resolved by means of ADR (alternative Dispute Resolution), especially mediation. By mediation the dispute resolution becomes cheaper and faster to complete, the outcome is expected to achieve a win-win solution. For a physician who commits the dispute resolution of the case with patients in a mediation, facilitated by a mediator, it is actually profitable in terms of problem resolution speed. But there are constraints, because the results of mediation that is considered strong is the deed of peace, whereas with the deed of peace from the court considered as a public domain, so it is open to the public. For a doctor who is experiencing this incident certainly does not want the problem spread widely known by the public, because it will harm his reputation as a doctor.

Administrative Liability: Doctors accountability in the field of administrative law, became clearer since the enactment of the Medical Practice Act of 2004. With the enactment of health law year 2009, there is relatively little change pertaining to the accountability of administration for doctors. Because it has been contained in the Medical Practice Act of year 2004. In conducting an abortion, a physician must fulfill administrative requirements such as the Letter of the Registry Sign (STR) and the Practice Permit (SIP), in addition to the competency of performing abortion must be obtained from the training that has been followed in accordance with Regulation of Health Minister Number 3 of 2016 on the training and management of the abortion for indications of medical emergency and pregnancy due to rape. If any requirements are not met then the doctor will face a problem that leads to a violation of administration with the sanction of its practice licenses.

Even the threat of administrative action pursuant to article 188 of this health legislation through the Minister to health workers (in this case still include the doctors) and health facilities. Article 188 paragraph (1) states the Minister may take administrative action on health workers and health care facilities in violation of the provisions as provided for in this law. Similarly, in verse (2) that reads that; The Minister may delegate the authority as referred to in paragraph (1) to a non-ministerial government institution, head of provincial service, or district/municipality whose principal duties and functions in the field of health.

In article 76c and d of Health law year 2009 mentions performing of abortion as mentioned in article 75 can only be done c. With the consent of the pregnant mother concerned; d. With the consent of the husband, except rape victims. In this case the consent in question is the presence of informed consent first before the action, either from the patient himself or the permission of the husband or his family.

In article 349 of the criminal code, in addition to the doctor can be sentenced to heavier than the general person if doing illegal abortion, can also be revoked practice permit. It is written as follows; If a doctor, midwife or physician assists in committing the crime in article 346, or doing or assisting, committing any of the crimes described in article 347 and 348 of the criminal code, then the criminality prescribed in those chapters can be augmented by a third and can be revoked the right to carry out its work in which the crime is committed.

We know that physician who performed illegal abortion, the responsibility should be in ethical and legal domain. Similarly, when the abortion is both legal and illegal not in accordance with the discipline of the knowledge, there can be consequences that will end with a complaint of the patient or his family to the MKDKI. The process at MKDKI itself can end with the complaint was rejected, the complaint is not acceptable or the pen received and the complaint that the process is terminated. If received and processed further, then the decision may be that the doctor is guilty or innocent. Sanctions if the doctor is guilty, is a disciplinary sanction in the form of written warning, obligation to participate in training and revocation recommendation of STR and or SIP. There are two kinds of sanctions following education and training: formal re-education and non-formal re-education. Recommendations for revocation of STR or SIP can be temporary (at least 1 year), remain or forever, or there are also restrictions on certain medical care measures.
The parties that can be held accountable in the hospital are juridically in the group in: a. The Management of the hospital represented by the head of the hospital/director/CEO; b. Doctors, dentists who work in hospitals; c. The nurses and other health workers and non-health personnel (administration, security, hygiene, etc.).

With the strong predicate as a public servant, the hospital should be prosecuted to be able to conduct services in the field of health with the best to the community. In addition to some hospital responsibilities as a medical service, the hospital is also legally responsible for all losses incurred by the negligence made by the medical personnel, other health workers, as well as the negligence made by any officer who is under the hospital.

It also applies responsibility if there is an illegal abortion. A practising doctor in the hospital can be an employee or a guest physician. Some argue that the hospital as an institution that provides care and treatment services, is responsible for all the events that occur in it. On the basis of the Corporate Liability doctrine, hospitals are responsible for the overall quality control of the services to the patients they care about. The working relationship between doctors and hospitals needs to be redefined with the rules that the hospital has made in which doctors work, so that the purpose of hospital service is more quality and provides safe protection for patients.

Ethics and Professional Discipline: The ethical liability is severely perceived by the doctor, precisely by the formal ethical basis in this case through MKEK, the accountability of doctors who perform illegal abortion is very severe. But if it is thought deeper, then the goal of doing ethical actions is for the benefit of being helped. Teleological ethics will certainly consider the correct purpose of the action. For abortion, these adherents could have thought of what it would be if people who wanted this abortion were not followed. But from the moral side, it must also be used to consider it. For doctors in violation of the ethics, implementing an illegal abortion, will be sanctioned by the Indonesian Ulema Council of Medicine, pursuant to law number 29 of 2004 on medical practice.

Religion: Almost all religions and the flow generally defy abortion.

a. Islamic Views: According to Abdulrahman in Maryati mention, abortion that be done after blowing the spirit by Allah, which is after 4 (four) months of pregnancy is “haram” (forbidden), and all of the scholars of the Fiqh agree to this. But the view is different with the performing an abortion done before this event (blowing of the spirit by Allah), some scholars have allowed and others disagreed. The fatwa of the Indonesian Ulema Council (MUI) said that it has issued a fatwa abortion exemption since the government removed the health Law in 2009. “So, it’s not new anymore. We have issued a fatwa supporting abortion with the exception since the government still boil law and then the rule of government, “said deputy general chairman of the Ma’ruf Amin Center to CNN Indonesia, Monday, 17 November 2014, responded to the exit of PBNU decision on the exclusion of prohibition of abortion, while MUI allowed abortion.

Abortion against rape content can be done before the content reaches the age of 40 days. Fatwa MUI No. 4 year 2005 about abortion, explaining the action of abortion is allowed if pregnant women suffer from severe physical pain such as advanced stage cancer, tuberculosis with Caverna and other physical diseases that must be prescribed by the Doctor team. Then, in a situation where the pregnancy threatens the life of the mother. The Fatwa also describes a state that related to pregnancy that can allow abortion, namely the fetus that was detected is a genetic defect that if born later is difficult to heal.
b. **Christian Views:** From the Christian view, abortion is an unjustified act. In the Bible it says clearly, that God is not pleased with the murder as it does in the act of abortion. Human life has begun when conception occurs. If we do miscarriage consciously, it means that we are doing immoral and asocial deeds. We should not let the cessation of the lives of anyone.

c. **Catholic Views:** The Catholic Church ceases to condemn abortion, which is directly and well-planned to revoke the life of an unborn infant. The Catholic people believe that all life is holy. The church invites to respect human life from the beginning. Therefore, it can be said firmly, the church denies any abortion in any way and reason. Abortion is a deed against the law of God and nature. This action will lead to adverse consequences, especially to the fetus’s mother and father, perhaps to abortion executants and the general public.

d. **Hindu’s Views:** Abortion in Theology Hinduism, belongs to the deed called Himsa Karma, which is one of the deeds of sin that is aligned with killing, hurting and torture. Killing in a deeper sense as “removing life”, underlying the philosophy of the Atma or spirit that has been and attached to the baby, although still a blood clot that is not perfect like the human body.

e. **Buddhism Views:** The Buddha teaches a variety of teachings that can be entirely classified into three core teachings, namely: Sila, Samadhi and Panna. The essence of Sila is not committing wickedness and always doing good and virtue. The hallmark of Sila is Order and serenity. This states the inner state of living rules encompasses all good behaviors and traits including moral and ethics. Samadi is to purify the mind. The ultimate goal of the Buddhist teaching is to bring its implementation to liberation (Panna). In Buddhist views, abortion is an act of miscarriage or killing a living creature already in the womb of a woman. From a Buddhist standpoint, abortion can be tolerated to do when it carries a dangerous impact to the mother and not the other.

Thus the Doctor who will do an illegal abortion, will also be affected by the religion he has. adopted, and think according to his knowledge.

**Conclusions**

The high number of abortion cases in Indonesia proves that abortion is not a problem that can be underestimated, because abortion is one of the causes of the high mortality rate for pregnant women in addition to other factors. Many of these abortions are carried out in secret, possibly carried out by incompetent people and in an unsafe way. This occurs because many pregnancies require abortion (according to the mother concerned), but are not covered by legal indications. In this case the doctor also cannot help her, and if he tries to help, he will have an illegal abortion.

The liability of illegal abortion done by the doctor in Indonesia are include criminal liability, civil liability and administrative liability. Besides that, professional discipline liability and ethical liability also must be borne to the doctor concerned. Criminal liability can be borne heavier to the doctor, midwives or medicine man compared to the common man, if criminal code is be used, but just the same if the health law that being used.

According to the health law of 2009, legal abortion is including performing abortion to save the life of woman concerned, to the womb of the woman that the foetus is severe handicap (and cannot life by self after being born) and pregnancy due to rape (not more than 6 weeks). But not for pregnancy due to the fail of family planning method and to the pregnancy of idiot woman that pregnant without knowing who is the biological husband.

These characteristics of abortion liability for the doctor will prohibit the doctor who help someone who need performing of abortion because of: failing of family planning method, mental retarded woman that pregnant by unknown man and pregnant woman because of rape more than 6 weeks. This reason not for pregnancy that caused by promiscuity and immoral habits.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Taken from Hang Tuah University, Surabaya, Indonesia

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23. Act Number 29 of 2004 on Medical Practice
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27. Regulation of Medical Council Number 2 of 2011 on Procedures for Treating Bodies of Suspected Violation of Discipline by Doctors and Dentists.
Genetic Polymorphism of 15 Autosomal STR loci in Population of Madhya Pradesh

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Abstract

We report here an autosomal STR DNA database of Population of Madhya Pradesh and evaluation of autosomal STR diversity in the context of population genetics and forensic efficiency parameters. In this study, Allele frequencies of 15 autosomal STR loci were investigated in 123 unrelated individuals (57 Female & 66 Male) from the various geographical regions of Madhya Pradesh using PowerPlex® 16 HS System. All the studied loci appeared the high degree of genetic polymorphism with observed heterozygosity (Ho= observed heterozygosity) ranged from 0.911 (D21S11) to 0.659 (TPOX). Locus PENTA E showed the highest power of discrimination (0.978) and the highest polymorphism (PIC = 0.90). The combined probability of match (CPM) and combined paternity Index (CPI) for all the 15 STR loci was found to be 2.8 x 10^-18 and 1.2 x10^6, respectively. The combined discrimination power (CPD) and combined exclusion power (CPE) for all the tested 15 Loci was observed 1 and 0.99999989 respectively, assign that all the loci are highly polymorphic and have the potential for forensic application.

Keywords: Autosomal, Madhya Pradesh, Forensic DNA Typing, Population study, Short tandem repeats (STRs).

Introduction

Madhya Pradesh is geographically located in the centre of India. It is rich in cultural and linguistic diversity and the second largest state by area in the country. In history, it was the primary route of human migration, which is the major factor behind the rich human genetic diversity. As per census 2011, the population of Madhya Pradesh is 7.27 Crore, which is 6% of the total population of the country4(1). In this study, we evaluated the population genetic parameters in population of Madhya Pradesh. The data reported here will contribute toward the DNA database that can be used as a reference for forensic studies for human identity as well as for population genetic and anthropological purposes.

Materials and Method

Sampling: In this study 123 (57 Female & 66 Male) autosomal short tandem repeat (STR) data generated from blood samples were taken from routine casework analysis performed by the authors who work at the DNA Fingerprinting Unit, State Forensic Science Laboratory, Sagar, MP, India. The samples for this study were taken only from unrelated individuals belonging to all regions of Madhya Pradesh. For all the samples prior informed written consent was also obtained from the individuals as per the routine DNA examination procedure of the laboratory and following the Code of Ethics of the World Medical Association (i.e., Declaration of Helsinki)(2). No minor was involved in the study.

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Phone No.: 9424371946
DNA Extraction and Quantification: Genomic DNA extracted from the blood samples using 12 GC automated DNA extraction system (PSS, Japan). Extracted DNA was quantified using Qubit Fluorometric Quantitation (Applied Biosystems, Foster City, CA, USA- Thermo) with Qubit ds DNA BR Assay Quantification Kit (Thermo) as per the protocol recommended by the manufacturer.

PCR amplification and STR typing: 15 STR loci and a sex determination marker (Amelogenin) were amplified simultaneously using PCR multiplex PowerPlex® 16 HS (Promega) as per procedure recommended by the manufacturer using ABI 9700 thermal cycler (Thermo). The amplified DNA fragments were separated on capillary electrophoresis following the manufacturer’s recommendations using a 3100Genetic Analyzer (Thermo) and sized withGeneScan500-LIZ internal lane size standard (Thermo) following manufacturer’s recommended protocol. After amplification and separation, DNA fragments were genotyped using GeneMapper Software v3.5 (Thermo). The complete procedure and steps were followed as per standardized internal laboratory and kit controls. The authors also have qualified international proficiency test organized by GITAD, Spain (http://gitad.ugr.es/principal.htm).

Statistical and phylogenetic analysis: Allele frequencies were computed using GenAlEx version 6.5(3). The Hardy–Weinberg P-values, observed heterozygosity (Ho) and expected heterozygosity (He), population differentiation test were calculated using Arlequin Version3.5(4). Genetic parameters of forensic interest viz. Power of Discrimination (PD), Matching Probability (PM), Polymorphic Information Content (PIC), Power of Exclusion (PE), and Typical Paternity Index (TPI) were calculated using the PowerStatsv1.2(5). Allele frequencies obtained from the studied population were compared with data of other published populations on the basis of p-value of the exact test for Hardy–Weinberg equilibrium (calculated using the Arlequin software version 3.5(4)). Also, population differentiation tests Fst genetic distances for comparison with other published populations was carried out using Arlequin version 3.5(4). A phylogenetic tree of the studied population with previously reported 15 populations was constructed with the Neighbour-joining method by software package Poptree2(6) comparing 13 common STR loci showing the inter-population relationship.

Findings: Distribution of allele frequencies and statistical evaluations of the 15 autosomal STR loci in the studied population are reported in Supplementary data. All loci demonstrated the high level of genetic polymorphism with observed Heterozygosity (Ho) ranged from 0.911 (D21S11) to 0.659 (TPOX), the Expected Heterozygosity (HE) ranged from 0.904 (PENTA E) to 0.701 (TPOX). PENTA E demonstrated the greatest power of discrimination (0.978) in the studied population, while TPOX showed the lowest (0.863). The power of exclusion (PE) varies between 0.367 (TPOX) and 0.817 (D21S11). Among all the studied 15 loci, PENTA E had the highest polymorphism (PIC = 0.90), whereas TPOX had the lowest (PIC = 0.65). The most polymorphic and discriminatory STR locus of the studied population is PENTA E with the value of 0.978 (power of discrimination)and 0.90 (polymorphic information content), respectively. The combined power of discrimination (CPD) and the combined power of Exclusion (CPE) were observed with a value of 1 and 0.99999989, respectively. The combined probability of match (CPM) and combined paternity Index (CPI) for all the 15 STR loci was found to be 2.8 x 10^{-18} and 1.2x10^{6}, respectively.

Table 1: Observed allele frequency and forensic parameters for 15 Autosomal STRs in studied Population (N=123)

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<th>D3S1358</th>
<th>THO1</th>
<th>D21S11</th>
<th>D18S51</th>
<th>PENTA E</th>
<th>D5S818</th>
<th>D13S317</th>
<th>D7S820</th>
<th>D16S539</th>
<th>CSF1PO</th>
<th>PENTA D</th>
<th>D8S1179</th>
<th>TPOX</th>
<th>FGA</th>
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<td>0.012</td>
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</table>

**PD** - Power of discrimination, **PIC** - Polymorphism information content, **PE** - Power of exclusion, **PI** - Paternity index, **Ho** - Observed heterozygosity, **He** - Expected Heterozygosity, **P-value** - HWE test, **Pm** - Matching Probability, **F** = Fixation Index = (He - Ho)/He = 1 - (Ho/He)

Values in bold represent lowest and highest values of forensic parameters.
Population differentiation test was carried out through Arlequin software. In this test, allelic frequencies of studied population (Madhya Pradesh) was compared with geographically neighbouring regions for which published data is available, namely Balmiki (Punjab), Sakaldwipi-Brahmin (Jharkhand), Mahadev-Koli (Maharashtra), Iyengar (Tamilnadu), Kurumans (Tamilnadu), Lambadi (Andhra Pradesh), Yerukula (Andhra Pradesh), Santal (Chota Nagpur), Bhil (Madhya Pradesh), Balmiki (Jharkhand), Bhil (Gujarat), Central Indian population, Gond (Madhya Pradesh), Kahar population (Uttar Pradesh), population of Jharkhand, population of Uttar Pradesh. After applying the Bonferroni correction (at the significant level of 95% p<0.003), the population differentiation tests showed that studied population had significant differences with Balmiki (Punjab) in 2 out of 13 loci, with Sakaldwipi_Brahmin (Jharkhand) in 4 out of 13 loci, with Mahadev_Koli (Maharashtra) in 5 out of 13 loci, with Iyengar (Tamilnadu) in 1 out of 13 loci, with Kurumans (Tamilnadu) in 1 out of 13 loci, with Lambadi (Andhra Pradesh) 3 out of 13 loci, with Yerukula (Andhra Pradesh) 9 out of 13 loci, with Santal (Chotanagpur) 6 out of 13 loci, with Bhil (Madhya Pradesh) 3 out of 13 loci, with Bhil (Gujarat) 2 out of 13 loci, with central Indian population 1 out of 13 loci, Gond (Madhya Pradesh) 6 out of 13 loci, with population of Jharkhand 1 out of 13 loci and there is no significant difference with UP population and Kahar population (Uttar Pradesh).

To confirm the results of the population differentiation test (Fst-P), Neighbour Joining (NJ) Tree (Fig.1), and Principal Component Analysis (PCA) (Fig.2) were performed for the studied population along with previously reported populations. NJ tree revealed the genetic relatedness with the previously reported population of Madhya Pradesh, central Indian population, and clustered with Population of Uttar Pradesh along with some outlier population (Fig.1). In Principal Component Analysis (PCA), component 1 and component 2 explained 67.918% variance in the studied population. In the PCA plot, geographically close population pooled in one cluster (Fig.2). Neighbour Joining Tree and PCA plot showed consistency with each other.

![Fig. 1: NJ tree of the studied population showing the genetic relatedness with the previously reported populations.](image-url)
Fig. 2: Principal component analysis (PCA) plot based on Nei’s Da distance matrix showing the distance pattern of studied population with previously reported populations.

Conclusion

The data set generated from this study will enrich the DNA data bank. The studied 15 STR markers are polymorphic, informative and can be used in forensic application as well as anthropological studies for Indian population. The studied population has significant genetic diversity.

Conflict of Interest: Authors declared that they have no conflict of interest.

Source of Funding: Self funding

Ethical Clearance: This study was approved by the Institutional Ethical Committee of the Jaipur National University, Jaipur vide letter no. JNUMSRC/IEC/2018/45 dated 20.07.2018.

Acknowledgements: Authors acknowledge the support and motivation from Director, State Forensic Science Laboratory, Sagar, MP, India.

References


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The Education on the Utilization of the MCH Handbook Using the Brainstorming Method on the Fulfillment of Nutritional Intake and Developmental Stimulation of Children Under Two Years (aged 6-24 Months) in Gunung Kapur, Lempake Village

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Abstract

Introduction: Optimal growth and development in children under two years is usually supported by good nutritional status. In addition, there is also a need for developmental stimulation from the mother, family and closest people to support children’s intelligence. The government has long launched the Maternal and Child Health (MCH) Handbook as an attempt to assist mothers in meeting the needs of their children. However, the implementation of the program is still not optimal. This can be proven by the number of nutritional status and development of children which does not match their age that is still quite high.

Method: This study was a quasi-experimental study, with a pre-test and post-test nonequivalent control group design. The number of samples used was 60 children under two years, which was taken from a population of 131 children under two years in Gunung Kapur. The sampling technique used was non-probability sampling with consecutive sampling method. The instrument used was a questionnaire adapted from the MCH Handbook. Data were then analyzed using univariate and bivariate analyses with independent t-test.

Results: The results of hypothesis testing with Paired T-Test showed that there was an effect of education on the utilization of the MCH Handbook using the brainstorming method on the fulfillment of nutritional intake (p value = 0.001) and developmental stimulation (p value = 0.001). Analysis of the difference on the two groups showed that the treatment group with the educational intervention using the MCH Handbook using the brainstorming method had a greater effect on the fulfillment of nutritional intake and developmental stimulation with the Independent T-Test (p value = 0.001) compared to the control group.

Conclusion: There is an effect of education on the utilization of the MCH Handbook using the brainstorming method on the fulfillment of nutritional intake and developmental stimulation of children under two years (aged 6-24 months) in Gunung Kapur, Lempake Village.

Keywords: Education, nutritional intake, developmental stimulation.

Introduction

Children are important human resources as the successor of a future nation. As adults, children who have healthy and optimal growth and development are able to develop the nation properly and wisely. The quality of the nation in the future is determined by the quality of today’s children. It is supported by Sofyan Djilal as Head of the National Development Planning Board (Bappenas) together with UNICEF stating that 30% of the total population of Indonesia is children. They are 100% of the future of the nation and deserve attention in terms of growth and development from various circles¹.

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Unfortunately, growth and developmental delay in children is still a serious problem in both developed and developing countries in the world\textsuperscript{2-5}. This is also an urban health problem\textsuperscript{1}. Based on Indonesia’s health profile in 2011, 13-18\% of children experienced developmental delay\textsuperscript{6}.

Furthermore, the Profile of Indonesian Children in 2015 shows that 16.17\% or 13,396,485 of Indonesia’s population are children under two years. The prevalence of children under two years with malnutrition shows that 17.9\% and 4.9\% suffer from malnutrition. Besides, in East Kalimantan Province, there were 19.4\% children under two years with malnutrition in 2010. This condition has almost reached the national standard of 20\%, which so far still needs to get much concern\textsuperscript{7}.

In fact, mother is primary care or who has direct involvement in process of providing care and feeding for children under two years\textsuperscript{8-10}. Thus, mothers have a very important role in meeting children’s needs. Those who have children under two years should know or have read the contents of the Maternal and Child Health (MCH) Handbook. This book contains information about instructions, guidelines and ways to achieve maternal and child health as a government effort to increase knowledge and behavior in healthy living. A correct and consistent perception or view of the MCH Handbook as a tool to monitor children’s health and growth and development is needed\textsuperscript{11}. Perceptions of an object, whether right or wrong, good or bad, positive or negative, cause a response to a person, so that it can be the basis for determining positive or negative attitudes.

Considering the aforementioned phenomenon, researchers are interested in conducting a study entitled “The Effect of the Education on the Utilization of the MCH Handbook Using the Brainstorming Method on the Fulfillment of Nutritional Intake and Developmental Stimulation of Children Under Two Years (aged 6-24 Months) in Gunung Kapur, Lempake Village”.

Materials and Method

Research Location: The research was carried out in 5 Integrated Services Post (Posyandu) spread out in Gunung Kapur, Lempake Village.

Research Design: This study was a quasi-experimental study, with a pre-test and post-test nonequivalent control group design.

Data Collection Method: The data were collected by conducting a pre-test using a questionnaire for the fulfillment of nutritional intake and developmental stimulation in the treatment and control groups. It was then continued by providing education regarding the utilization of the MCH Handbook with the brainstorming method in the treatment group. After one month, a post test was carried out using a questionnaire on the fulfillment of nutritional intake and developmental stimulation in the treatment and control groups as evaluation materials.

Data Analysis: The data that had been collected were analyzed, including univariate and bivariate analyses, using independent t-test to determine the effect of education on the utilization of the MCH Handbook with the brainstorming method on the fulfillment of nutritional intake and developmental stimulation of children under two years (aged 6-24 months) in Gunung Kapur, Lempake Village.

Results

Univariate Analysis:

Respondent Characteristics:

Table 1: Characteristics of Mothers Who Have Children Under Two Years (Age 6-24 Months) in Control and Treatment Groups in Gunung Kapur, Lempake Village

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total N = 60</th>
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<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>&lt; 20 years</td>
<td>1</td>
</tr>
<tr>
<td>20-29 years</td>
<td>32</td>
</tr>
<tr>
<td>30-40 years</td>
<td>19</td>
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<tr>
<td>&gt; 40 years</td>
<td>8</td>
</tr>
<tr>
<td>Last Education</td>
<td></td>
</tr>
<tr>
<td>Elementary School/equivalent graduate</td>
<td>9</td>
</tr>
<tr>
<td>Junior High School/equivalent graduate</td>
<td>14</td>
</tr>
<tr>
<td>Senior High School/equivalent graduate</td>
<td>32</td>
</tr>
<tr>
<td>College graduate</td>
<td>5</td>
</tr>
</tbody>
</table>
Based on Table 1, it can be seen that the characteristics of mothers based on age indicate that most of them are in the 20-29 years category as much as 53.3%. The characteristics of mothers based on the last education indicate that most of them are junior high school/equivalent graduates as much as 53.3%. Moreover, the characteristics of mothers based on occupation indicate that almost all of them are housewives as much as 86.7%. In addition, the characteristics of mothers based on family income show that some are in the 2,000,000-4,000,000 category as much as 50.0%.

**Fulfillment of Nutritional Intake before and after Education Given to Control and Treatment groups:**

**Table 2: Fulfillment of Nutritional Intake Before and After Education Given to Control and Treatment Groups**

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
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</thead>
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<tr>
<td><strong>Fulfillment of Nutritional Intake</strong></td>
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<td></td>
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<tr>
<td>Treatment</td>
<td></td>
<td></td>
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<tr>
<td>Before</td>
<td>30</td>
<td>48.91</td>
<td>23.932</td>
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<tr>
<td>After</td>
<td>30</td>
<td>83.30</td>
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<tr>
<td><strong>Control</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Before</td>
<td>30</td>
<td>43.44</td>
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<td>44.97</td>
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</table>

Based on Table 2, the mean of fulfillment of nutritional intake variable for the treatment group before the education was 48.91 and after the education was 83.30. It indicates that there was a significant increase with the difference of the mean before and after the education (34.39).

**Developmental Stimulation Before and After Education Given to Control and Treatment groups**

**Table 3: Statistical Description of Developmental Stimulation Before and After Education Given to Control and Treatment Groups**

<table>
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<th>Variables</th>
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<th>SD</th>
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</thead>
<tbody>
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<tr>
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<td>Before</td>
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</table>

Based on Table 3, the mean of developmental stimulation variable for the treatment group before the education was 58.03 and after the education was 83.30. It indicates that there was a significant increase with the difference of the mean before and after the education (25.27).
Bivariate Analysis:

Paired T-Test:

Table 4: The Results of Bivariate Analysis of Fulfillment of Nutritional Intake and Developmental Stimulation in Treatment and Control Groups Using Paired T-Test

<table>
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<th>p value</th>
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<tr>
<td>Treatment Before</td>
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<td>48.91±23.932</td>
<td>0.001</td>
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<tr>
<td>Treatment After</td>
<td>30</td>
<td>83.30±11.490</td>
<td></td>
</tr>
<tr>
<td>Control Before</td>
<td>30</td>
<td>43.44±23.363</td>
<td>0.055</td>
</tr>
<tr>
<td>Control After</td>
<td>30</td>
<td>44.97±24.169</td>
<td></td>
</tr>
<tr>
<td>Developmental Stimulation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment Before</td>
<td>30</td>
<td>58.03±22.021</td>
<td>0.001</td>
</tr>
<tr>
<td>Treatment After</td>
<td>30</td>
<td>83.30±11.490</td>
<td></td>
</tr>
<tr>
<td>Control Before</td>
<td>30</td>
<td>59.30±18.107</td>
<td>0.079</td>
</tr>
<tr>
<td>Control After</td>
<td>30</td>
<td>60.00±17.794</td>
<td></td>
</tr>
</tbody>
</table>

Based on Table 4, it was found that p = 0.001 <0.05 for fulfillment of nutritional intake variable and developmental stimulation variable in the treatment group. Thus, there was an effect of education on fulfillment of nutritional intake and developmental stimulation in the treatment group in Gunung Kapur, Lempake Village.

Independent T-Test:

Table 5: The Results of Bivariate Analysis of Fulfillment of Nutritional Intake and Developmental Stimulation in Treatment and Control Groups Using Independent T-Test

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Mean±SD</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulfillment of Nutritional Intake</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before Treatment</td>
<td>30</td>
<td>48.91±23.932</td>
<td>0.374</td>
</tr>
<tr>
<td>Treatment After</td>
<td>30</td>
<td>83.30±11.490</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>43.44±24.169</td>
<td></td>
</tr>
<tr>
<td>After Treatment</td>
<td>30</td>
<td>83.30±11.490</td>
<td>0.001</td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>44.97±24.169</td>
<td></td>
</tr>
<tr>
<td>Developmental Stimulation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before Treatment</td>
<td>30</td>
<td>58.03±22.021</td>
<td>0.809</td>
</tr>
<tr>
<td>Treatment After</td>
<td>30</td>
<td>59.30±18.107</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>59.30±18.107</td>
<td></td>
</tr>
<tr>
<td>After Treatment</td>
<td>30</td>
<td>83.30±11.490</td>
<td>0.001</td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>60.00±17.794</td>
<td></td>
</tr>
</tbody>
</table>

Based on Table 5, the mean and standard deviation values of the fulfillment of nutritional intake variable before treatment were 48.91 ±23.932, while the values of the control group were 43.44 ±24.169 with p = 0.374 > 0.05. It means that there was no significant difference in the difference value between the two groups.
Additionally, the mean and standard deviation values of the fulfillment of nutritional intake variable after the treatment were 83.30 ± 11.490, while the values of the control group were 44.97 ± 24.169 with p = 0.001 < 0.05. It means that there was significant difference in the difference value between the two groups.

More importantly, the mean and standard deviation values of the treatment group before the treatment were 58.03 ± 22.021, the values of the control group were 59.30 ± 18.107 with p = 0.809 > 0.05. It means that there was no significant difference in the difference value between the two groups. Besides, the mean and standard deviation values of the treatment group after treatment were 83.30 ± 11.490, while the values of the control group were 60.00 ± 17.794 with p = 0.001 < 0.05. It means that there was significant difference in the difference value between the two groups.

Therefore, it can be said that there was no significant difference between the fulfillment of nutritional intake in treatment and control groups before using the MCH Handbook. However, there was a significant difference between the fulfillment of nutritional intake in the treatment and control groups after the treatment in the form of education on the utilization of the MCH Handbook.

**Discussion**

**a. The Effect of the Education on the Utilization of the MCH Handbook Using the Brainstorming Method on the Fulfillment of Nutritional Intake of Children Under Two Years (aged 6-24 Months) in Gunung Kapur, Lempake Village**

In this research, the mean of the fulfillment of nutritional intake variable in the treatment group before the education on the utilization of the MCH Handbook was 48.91. Mothers, as research respondents, then received the education on the utilization of MCH Handbook with the brainstorming method.

Besides, the mean of the fulfillment of nutritional intake variable in the treatment group after the education on the utilization of the MCH Handbook was 83.30. This shows an increase in the mean of fulfillment of nutritional intake variable before and after the education on the utilization of the MCH Handbook, which is 34.39 with p = 0.001 < 0.05.

Moreover, mothers in the treatment and control groups affirmed that they had read the MCH Handbook. However, they only read without applying how to fulfill proper nutritional intake for children under two years (aged 6-24 months). In fact, knowledge is closely related to the amount of information a person has. The more information a person has, the higher their knowledge. Brainstorming method was deliberately chosen with the aim of increasing the active role of the mother, generating creative roles, stimulating participation, and creating a pleasant atmosphere.

**b. The Effect of the Education on the Utilization of the MCH Handbook Using the Brainstorming Method on the Developmental Stimulation of Children Under Two Years (aged 6-24 Months) in Gunung Kapur, Lempake Village**

In this research, the mean of the developmental stimulation variable in the treatment group before the education on the utilization of the MCH Handbook was 58.03.

More importantly, the mean of developmental stimulation after education on the utilization of the MCH Handbook was 83.30. It indicates an increase in the mean of developmental stimulation before and after the education on the utilization of the MCH Handbook, which was 25.27 with p 0.001 <0.05.

Here, the mothers admitted that they had read the MCH Handbook, but they did not know the developmental stimulation that should be given to children based on age.

In this study, it was found that there was an increase in the mean value in the treatment group after the education. These results are in line with the research conducted by Muflihah (2017) which claimed that mother’s knowledge and skills in providing developmental stimulation to toddlers have increased after receiving education.

**c. The Differences in the Fulfillment of Nutritional Intake and Developmental Stimulation in the Control and Treatment Groups**

The results of the research analysis obtained independent t-test on the fulfillment of nutritional intake and developmental stimulation in the control and treatment groups, that is p = 0.001 <0.05.
Education with the brainstorming method has a significant effect on the results obtained. It is in accordance with the research conducted by \(^{15}\) (Syafi’udin, Wantiyah dan Kushariyadi, 2018) which proved that health education using the brainstorming method is more effective than the lecture method. One of the advantages of the brainstorming method is that it is able to provide stimulation for all participants to actively take part in it, besides that it uses little equipment.

**Conclusion and Recommendations**

There is an effect of education on the utilization of the MCH Handbook using the brainstorming method on the fulfillment of nutritional intake and developmental stimulation in Gunung Kapur, Lempake Village. Last but not least, this research recommends the Health Office to further motivate community health center officers in socializing and educating mothers with toddlers regarding the utilization of the MCH Handbook. The community health center is expected to be able to hold regular meetings with Integrated Services Post cadres in providing education on the utilization of the MCH Handbook to mothers.

**Ethical Clearance:** Health Polytechnic of the Ministry of Health, East Kalimantan, Samarinda.

**Source of Funding:** Health Polytechnic of the Ministry of Health, East Kalimantan, Samarinda

**Conflict of Interest:** Nil

**References**


A Comparative Study of DNA Extraction Method with and without Using Proteinase K Enzyme

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I.P. Tripathi1, Divya Shrivastava3, Pankaj Shrivastava2

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Abstract

Forensic DNA fingerprinting is the most believed method of the criminal investigation. With the advancement in technology, the method has become more and more sensitive and the technology now uses advanced method and new generation faster multiplex amplification systems. Most of these improvements in the technique are after the extraction of DNA. Despite automation in DNA extraction, still, the basic process of lysis of cells is an integral part of the analysis. We present here the comparison of DNA extraction results with and without using the proteinase k enzyme.

Keywords: DNA Extraction, Proteinase k, Forensic, DNA Fingerprinting.

Introduction

Deoxyribonucleic acid (DNA) based human identification is now accepted as the gold standard in forensics(1). It is recognized as the most convincing and practiced method in the criminal investigation since last two decades or more(2). Forensic evidence collected from various crime scenes areanalyzed by the present-day forensic DNA technology using capillary electrophoresis (CE) technique(3). The present-day DNA technology has faced many transformations to achieve the present state. With the advent of polymerase chain reaction (PCR), now it is possible to amplify even very minute quantities of DNA recovered from the crime scene in the detectable range(4). The results of DNA testing on evidence samples are compared with the results of DNA analysis of reference samples collected from known individuals. This power in the DNA technology was achieved with the development of the PCR based short tandem repeats (STRs) testing(1) coupled with CE. DNA profiling is done using pre-formulated and pre-validated multiplex amplification kits(5),(6) incorporating 15 to 27 markers. With the advancements in the technology, the multiplex kits used in forensic science are also improved not only in the number of markers in a single multiplex but also in the master mix, making the PCR faster(6). Such analyses can link victims with suspects, other evidence items, or with a crime scene.

The forensic DNA technology is well developed, and now since the last decade, attempts are being made to make the technology faster and cheaper. There have been many attempts towards the direct amplification of forensic evidence(7)(8)(9) including the launch of direct amplification kits for selected forensic samples by various manufacturers of multiplex kits. But still today, the standard method of DNA extraction using lysis buffer, sodium dodecyl sulfate (SDS) and proteinase k enzyme (PK) is widely accepted and most commonly used the technique in forensic DNA analysis because this technique is standardized with the whole variety of forensic samples.

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Normal forensic lysis buffer contains Tris (pH is maintained by HCL), EDTA (pH is maintained by NaOH) and NaCl. Besides lysis buffer SDS (Sodium dodecyl sulfate) is the most commonly used strong anionic detergent, which has the capability, to disrupt the cell membrane by solubilizing proteins and lipids along with denaturing histones and other DNA binding proteins. Proteinase k is the second most important chemical used in DNA extraction, which helps in digesting proteins. This enzyme also deactivates nuclease enzymes, which degrades DNA in the process of DNA extraction. Proteinase k is a costly chemical, in comparison with the other chemicals used in the process of DNA extraction. With the advancement of present DNA technology, the requirement of input DNA is less than 500 picograms with all the new generation multiplex amplification systems (Table 1). We tested the routine DNA extraction protocol of lysis with and without using the proteinase k enzyme.

**Material and Method**

Twenty-five liquid blood samples received as a case exhibit at the DNA Fingerprinting unit of State Forensic Science Laboratory, Sagar, MP, India, were used for the study. All the samples were collected with written informed consent and as per the declaration of Helsinki\(^{10}\) for the DNA fingerprinting examination. The samples were transported to the laboratory under the ice and were preserved at 4°C till further processing. 600µl of each liquid blood sample was processed with the lysis buffer (namely forensic buffer) routinely used in forensic DNA examination of the laboratory.

To each sample, 600 µl of forensic buffer (1 M Tris pH 8 with HCL, 0.5 M EDTA pH 8 with NaOH, and 5 MNaCl), 50 µl of 20 % SDS, and 10 µl of PK (20mg/ml) was added. All the samples were also processed simultaneously without using PK. A forensic paternity examination was also processed using both approaches.

Extracted DNA was quantified using the PowerQuant\textsuperscript{TM}human DNA quantification kit (Promega, Madison, WI, USA/Promega) on Real-Time PCR 7500 machine (Thermo). Quantified DNA was subjected to amplification for 15 autosomal Short Tandem repeats (as STRs) along with sex-determining Amelogenin marker using AmpFISTR®Identifiler\textsuperscript{®} Plus PCR Amplification kit (Thermo) on ABI 9700thermal cycler (Thermo) as per the recommendation of the manufacturer except 10µl reaction volume was used. 1 µl of amplified DNA was diluted in the solution of 10 µl HiDiFormamide and 0.2 µl Liz 500. DNA fragments were separated using POP-4 and 36 cm capillary array on ABI 3100 Genetic analyzer (Thermo) as per the recommended protocol of the manufacturer. Allelic Ladder provided along with the multiplex kit was used for the designation of the allele and obtained data was analyzed using Genemapper\textsuperscript{®} software v3.5 (Thermo).

**Findings:** The results of DNA extraction from blood samples with and without using the proteinase k enzyme are presented in Figure 1. All the 25 samples processed with and without proteinase k enzyme yielded a good quantity of DNA. The yield of DNA without PK ranged 30 to 46 ng/µl and the yield of DNA with PK ranged 35 to 61 ng/µl (Figure 1).
Table 1: Statistical analysis of quantity of DNA from blood samples

<table>
<thead>
<tr>
<th></th>
<th>25</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>35.54</td>
<td>30.55</td>
</tr>
<tr>
<td>25% Percentile</td>
<td>46.70</td>
<td>35.16</td>
</tr>
<tr>
<td>Median</td>
<td>51.54</td>
<td>35.91</td>
</tr>
<tr>
<td>75% Percentile</td>
<td>53.13</td>
<td>37.83</td>
</tr>
<tr>
<td>Maximum</td>
<td>61.05</td>
<td>46.31</td>
</tr>
<tr>
<td>Mean</td>
<td>49.87</td>
<td>36.34</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>6.335</td>
<td>3.487</td>
</tr>
<tr>
<td>Std. Error</td>
<td>1.267</td>
<td>0.6975</td>
</tr>
<tr>
<td>Lower 95% CI of mean</td>
<td>47.25</td>
<td>34.90</td>
</tr>
<tr>
<td>Upper 95% CI of mean</td>
<td>52.48</td>
<td>37.78</td>
</tr>
</tbody>
</table>

One sample t test

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Theoretical mean</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Actual mean</td>
<td>49.87</td>
<td>36.34</td>
</tr>
<tr>
<td>Discrepancy</td>
<td>-49.87</td>
<td>-36.34</td>
</tr>
<tr>
<td>95% CI of discrepancy</td>
<td>47.25 to 52.48</td>
<td>34.90 to 37.78</td>
</tr>
<tr>
<td>t, df</td>
<td>t=39.36 df=24</td>
<td>t=52.10 df=24</td>
</tr>
<tr>
<td>P value (two tailed)</td>
<td>&lt; 0.0001</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Significant (alpha=0.05)?</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

The mean value of DNA extracted using with proteinase k approach was 49.87 (Standard deviation=6.33) however the mean value of DNA extracted without using proteinase k approach was 36.33 (Standard deviation=3.48). The obtained results showed difference in the yield of DNA in both the approaches. However, as the need of DNA required for amplification using new generation multiplex kits are less than 500 picogram, hence the achieved quantity of extracted DNA sounds good enough for use in forensic DNA typing of samples which is expected to have a good amount of DNA.

We also present a case of sexual assault in which a lady was sexually assaulted and gave birth to a male child. The blood samples of suspect along with the samples of the victim and the newborn male child were received for establishment of paternity at State Forensic Science Laboratory, Sagar, MP, and India. DNA is extracted using both the approaches in this case of paternity establishment involving blood samples of the trio. The obtained results in the case using both the approaches are shown in Table 2.
Table 2: DNA profile of Trio in a case of paternity establishment

<table>
<thead>
<tr>
<th>Genetic Markers</th>
<th>Father</th>
<th>Child</th>
<th>Mother</th>
</tr>
</thead>
<tbody>
<tr>
<td>D8S1179</td>
<td>10,13</td>
<td>10,14</td>
<td>14,14</td>
</tr>
<tr>
<td>D21S11</td>
<td>28,28</td>
<td>28,30</td>
<td>30,33.2</td>
</tr>
<tr>
<td>D7S820</td>
<td>10,11</td>
<td>10,11</td>
<td>10,11</td>
</tr>
<tr>
<td>CSF1PO</td>
<td>11,12</td>
<td>11,12</td>
<td>7,11</td>
</tr>
<tr>
<td>D3S1358</td>
<td>15,17</td>
<td>16,17</td>
<td>16,16</td>
</tr>
<tr>
<td>THO1</td>
<td>6,6</td>
<td>6,7</td>
<td>7,7</td>
</tr>
<tr>
<td>D13S317</td>
<td>10,11</td>
<td>10,11</td>
<td>10,11</td>
</tr>
<tr>
<td>D16S539</td>
<td>10,11</td>
<td>11,12</td>
<td>9,12</td>
</tr>
<tr>
<td>D2S1338</td>
<td>23,25</td>
<td>18,23</td>
<td>18,23</td>
</tr>
<tr>
<td>D19S433</td>
<td>15,15.2</td>
<td>13,15</td>
<td>13,14</td>
</tr>
<tr>
<td>vWA</td>
<td>16,18</td>
<td>16,18</td>
<td>16,18</td>
</tr>
<tr>
<td>TPOX</td>
<td>8,11</td>
<td>8,11</td>
<td>8,9</td>
</tr>
<tr>
<td>D18S51</td>
<td>17,18</td>
<td>14,17</td>
<td>14,17</td>
</tr>
<tr>
<td>D5S818</td>
<td>12,12</td>
<td>12,13</td>
<td>11,13</td>
</tr>
<tr>
<td>FGA</td>
<td>23,26</td>
<td>23,24</td>
<td>22,24</td>
</tr>
<tr>
<td>AMELOGENIN</td>
<td>XY</td>
<td>XY</td>
<td>XX</td>
</tr>
</tbody>
</table>

Figure 3: DNA profile quality parameters in the same case of paternity
The child showed a perfect trio match with both the parents using both the approaches and same results were obtained. The DNA profile observed using both the approaches showed the concordance. DNA profile quality measures, namely peak height ratio, total peak height and mean locus balance were also compared (Figure 4). The compared profile quality parameters also showed the suitability of both the approaches for forensic DNA typing work using blood samples.

The compared profile quality parameters also showed the suitability of both the approaches for forensic DNA typing work using blood samples. As blood contains comparatively higher amount of DNA, hence we recommend this approach to be used for all the samples which has good amount of DNA. However with other range of forensic samples which has comparatively lower amount of DNA, this approach needs to be further evaluated.

**Conclusion**

The yield of DNA varied with and without the use of proteinase k, but a good quantity of DNA was extracted using both the approaches. The yield of obtained DNA without proteinase k was sufficient enough to be used in today’s forensic DNA testing, as the requirement of DNA in present-day DNA testing is less than 1ng. This study is useful for forensic DNA typing as well as human genetics and anthropological studies concerning high-quality DNA extraction.

**Conflict of Interest:** Authors declared that they have no conflict of interest.

**Source of Funding:** None

**Ethical Clearance:** This study was approved by the Institutional Ethical Committee of the Jaipur National University, Jaipur vide letter no. JNUMSRC/IEC/2018/45 dated 20.07.2018.

**Acknowledgements:** Authors acknowledge the support and motivation from Director, State Forensic Science Laboratory, Sagar, MP, India.

**Reference**

Legal Obedience, Social Change, and Health Issues: Analysis of the Governmental Decree No. 6 of 2012 on Cattle Control at Palu City

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¹Lecturer, Faculty of Sharia IAIN Palu, ²Lecturer, Faculty of Law Universitas Khairun Ternate

Abstract

This paper aims to analyze the factors which cause the violation of the Governmental Decree No. 6 of 2012 on Cattle Control at Palu City by cattle owners. This research was conducted at South Palu, especially at the North Birobuli District using the qualitative-naturalistic method. The results of this research show that the society has not yet obeyed the Regional Decree No. 6 of 2012 on Cattle Control at Palu City area due to some factors: (1) the new values of the Regional Decree No. 6 of 2012 is against the old values of the cattle owners; (2) the cattle owners do not have an understanding of the stipulations which apply nor do they understand the social change which is currently happening; (3) The attitudes and behaviors of the police officers and the changemakers were inconsistent and rather discriminative; and (4) the disobedience may cause health problems which are anthrax, nail and mouth disease, or other diseases to the cattle.

Keywords: Law, Sociology, Obedience, Cattle, Control, Health Issues.

Introduction

Cattle owners have not yet shown attitudes and behaviors which support the development of a safe and a comfortable city. They do not act according to the legal stipulations which apply. On the contrary, they let their cattle free to roam public areas, including roads. Even, some cattle were not brought in to their sheds at night.

Such manner of animal husbandry causes problems in the societies’ lives. There are usually problems between the people caused by some loss experienced by one of the parties, as their plantations, gates, or vehicles were wrecked by the roaming cattle. At night, there are some cattle which are not put in their sheds, but they rest at places such as roads, people’s lawns, or public facilities. At such places, the cattle leave their feces, which disturb the cleanliness and the aesthetics of the roads, the people’s lawns, and the public facilities.

These phenomena cause continual loss, not including the environmental destruction and the increase of the rate of road accidents. Another impact is that the cattle are not hygienic; they bring diseases which may spread to people, such as causing diarrhea when the cattle secrete their feces at water springs which are consumed by the people. They may cause other diseases also. Thus, it is important to carry out a research on the effectivity of this Regional Decree, with the title, “Legal Obedience, Social Change, and Health Issues: Analysis of the Governmental Decree No. 6 of 2012 on Cattle Control at Palu City.”

Method

This research used sociology juridical methods and library research approach. This research is also a prescriptive study, which aims to offer solution towards the problems in the Palu cattle control². This research is qualitative research that’s Denzin and Lincoln stated that qualitative research is the research which uses natural settings, aimed to interpret phenomena which occur and carried out by involving various existing methods.

1. The Cattle Owners Who Let Their Cattle Roam Free in the Morning and at Night: Generally, the cattle roam surrounding or proximate to the residences of their owners. This is carried out continually and is maintained due to the physical and the behavioral natures of the cattle, which make it possible for them to be proximate to human beings. The physical and the natural characteristics
of the cattle which enjoy resting in muds and leave feces may cause health problems, especially when discussing about sanitation and water sources. But the reason of why the cattle owners try to place their cattle in the shed is so that they are not caught, fined, nor imprisoned by the law-enforcing apparatus.

The research results show that there are still people who let their cattle roam free both in the morning and at night. Among them, there are those who have tried to cage their cattle but fail to do so. Yet, there are also those who leave their cattle be since the issuing of the Regional Decree No. 6 of 2012. The cattle owners who have posed an ignorant attitude since the initial issuing of the decree generally have some cattle which are rather wild and difficult to approach. Because of that, they are forced to only secure the cattle in the mornings and in the afternoons. Then, they let their cattle free at night. They feel rather relieved as they law-enforcement operation is carried out in the mornings and in the afternoons from 09.00 to 17.00 o’clock at the local time. Then, the cattle owners also let their cattle roam freely due to lack of energy and time, even though some realize that there are strengths and weaknesses in putting their cattle in the shed.4

2. The Cattle Owners Who Cage Their Cattle Solely at Night: The aim of the cattle owners in caging their cattle is to maintain their safety from unwanted issues such as getting them lost or stolen, having them hurt or injured due to traffic accidents, or having them catch some diseases. Even so, they realize that even though the cattle have been caged, the same unwanted issues may still happen, such as cattle theft.

Regarding their compliance with the implication of the Regional Decree No. 6 of 2012, they have the same reason as the cattle owners who let their cattle roam free in the morning and at night – which is solely to avoid being arrested or detained by the law-enforcing apparatus. These people try to save their cattle from the chance to go or to roam at city roads or other public places. In the morning, some of those cattle owners keep their cattle in the sheds and feed them grass or bran until around 10.00-11.00 o’clock. After that, the cattle are let out and brought to the field. The aim of keeping the cattle in the shed is so that they feel comfortable there, and to minimize the time that they roam at the forbidden places.

Whilst monitoring the cattle, there are times when the alertness of the owners decreases. Thus, the officials who were at that time carrying out the law-enforcement operation may detain the roaming cattle. Seeing such event, most of the cattle owners choose to surrender. But there are also those who oppose this action, such as RBI, a cattle-owner. Some of those cattle unexpectedly roamed to the city roads, where there were some officials in operation at that area. Then, RBI’s cattle were caught. Seeing this, RBI demanded the officials to release his cattle. Due to RBI’s strong and stern manner, the law-enforcing officials chose to let those cattle go.

3. The Cattle Owners Who Feed and Cage Their Cattle at Night: The cattle owners feed and cage their cattle at night because of their understanding on the cattle’s safety and their understanding on the areal development of the cattle which is limited by plantations and people’s residences. But, this type of cattle owner is at a low rate compared to the total population of 384 families of cattle owners, which is only 14 families, or 3,65%

On the issuing of the Regional Decree No. 6 of 2012, they took it seriously. This is because they opined that they were afraid of being caught by the police, in a conversation with BHR, WK, MRD, SNR, RBI, MSR, and KRL (September 2019). In effect, same as the two aforementioned types of cattle owners, they had to spare their time to take care of the cattle’s safety.

These are the descriptions of the cattle owner’s compliance to the Regional Decree No. 6 of 2012 on Cattle Control at North Birombi, South Palu District, Palu City, Central Sulawesi. According to Kelman, such compliance is caused by the attention which is focused solely on the impacts of law violation, which are punishments or negative sanctions. The law compliance is not based on the belief on the essence of the law, but it is based on the control from the authorities. Due to this principle in law-obedience, such compliance may only be carried out if there is a tight supervision.5 This is proven by the short effectivity in implementing the Regional Decree No. 6 of 2012.

After that period, the cattle owners return to their former habits, even though the Regional Decree No. 6 of 2012 had not been revoked. Habits which are present in the society can neither give contribution, nor can it be developed to the stage in forming higher rules or values.6 If compared to the development of material or physical cultures, as proven by the short description on the people and the area of research, the immaterial or the
non-physical cultures (especially regarding the manner in animal husbandry) of the people are still behind. According to Ogburn, such phenomenon is called the cultural lag.\(^7\)

4. The Factors Which Cause the Cattle Owners to Violate the Regional Decree No. 6 of 2012: There are some factors which cause the cattle owners to violate the Regional Decree No. 6 of 2012. A value is a guide and a stimulus of human behavior in the social interaction process, thus concretely, it functions as a system of manners.\(^8\) Raising livestock by letting them loose and roam free everywhere around the villages of the South Palu District has become the local people’s system of manner. Based on the field observation, all cattle owners do so in raising their livestock, in a conversation with SDM, HF and SF (September 2019).

Apart from that, in the educational aspect, such manner in raising livestock is not only limited to those who are of low education, but even those who had underwent middle or even high education, such as those who have obtained the bachelor’s degree. Thus, what is opined by Soedjito that education may change the cultural values in a society is not proven in this study.\(^7\) thus it is a tradition which is difficult to change.

The change programmed by the government does not bring welfare. On the contrary, some problems emerged in the social system of the cattle owners.\(^9\) As what has been explained in the previous part, most of the South Palu people farm for a living. Their farms, rice fields and plantations are a type of subsistent farming, which means that they use them to fulfill their own needs. Farming is their main jobs. Their time is mostly used to work in the rice fields or the plantations.

Such condition forces the South Palu people to not have much time to take care of their livestock intensively. Taking care of the livestock is only a part-time job which is not their priority. They do not depend on their cattle for life. Even though the cattle may bring forth much income if they are sold, such condition cannot be depended on, unlike the farm produces. Taking care of the cattle needs much time compared to that of farming. Thus, the livestock only functions as a source of reserve income, in a conversation with YSW, MSR. HF and KUI (September 2019).

Thus, the application of the Regional Decree No. 6 of 2012 results to the shift in the roles, jobs, time utilization which had been designed for years in the life system of the cattle owners in the South Palu District. They cannot yet accept such regulation. Lauer states that the shift in special social roles of individuals in a society regarding traditions, birth, and gender roles will shake the familial system.\(^10\)

The ignorance and the incomprehension of the cattle owners is caused by the lack of the regional decree socialization efforts by the government. The government has only informed of the prohibition from letting the cattle loose and free to roam through a megaphone from a vehicle along the roads. Such information was only announced trice. Then, the next week, there were arrests and detachments of the cattle which are caught roaming free. Such action of arrests and detachments were only carried out for three weeks. After that, no more of them had been done, in a conversation with KS, SDM and, MSR (September 2019). In this case the researcher agrees with Kurniaisih’s argument that the more intensive a socialization of a law is, the higher the understanding will be, and the more compliant someone is in abiding to that law.\(^11\)

Then, Alfian states that the manners of the law-enforcing officials have a great impact on the plans of development, especially because it is through them that the people will or will not be interested in participating in the development.\(^11\) Ironically, some of their actions even widen the gap between the people and the programs created. There are even those who feel antipathy or even hate to those programs, as known from an interview with EFR, REI, MSR and BLR (October 2019).

6. Health Problems and Social Change: The factor of facilities also has a role in the implementation of the program of social change through the issuing of the Regional Decree No. 6 of 2012. These facilities are not a principal thing, but it is a supporting factor in the program’s implementation. But their fulfillment must absolutely be carried out.

The facility meant is the location which becomes the shelter for the cattle which are arrested and detained, including the guarantee of their food, drink, and safety. The provision of this facility is crucial to anticipate the long detainment of some cattle, as they had not been picked up by the owners. Thus, the death and anything related to the cattle’s safety is the responsibility of the officers.\(^12\)

The real risk due to the handling of cattle carcasses
which experienced sudden death or due to sicknesses whilst they roam is usually ignored by the cattle owners in the village, even though they realize that there is a law against it. The unhygienic manner in animal husbandry is difficult to erase. Such situation cannot be separated from the socio-economic condition of the villagers who mostly live in poverty. The behaviors of the cattle owners are encouraged by the need to maintain the economic value which may be obtained by raising livestock whilst violating the law.

The stakeholders must give support to the Governmental Service which takes care of the animal health to plan a response towards the urgency in saving the lives of the animals and the people. There must also be the animal health risk assessment.

Conclusion

The results of this research show that the social change in the aspect of material culture is not simultaneous with the social change in the aspect of immaterial culture, which causes a cultural lag in the society. A cultural product may easily and quickly be accepted in a society if they directly sense the benefits.

The socialization of a developmental program, such as the Regional Decree No. 6 of 2012 regarding the Cattle Control in the area of Paly City is not intensive. It also lacks integration. It is incidental by the government, which makes the government lack understanding of that regulation’s essence. Thus, the short-term and the long-term goals which are to be achieved through the legal institutions cannot be realized as expected.

Apart from that, the planning which is underdone, like the problems of the provision of developmental operational facilities are neither complete nor adequate. This causes inefficiency. Thus, it causes the implementation of the development to stop. Another impact which is the emergence of issues and problems in the health issue, due to the in compliance of the cattle owners in implementing the constitution. The health issue which arise is due to the unhygienic animal husbandry system carried out by the people in Palu.

Ethical Clearance: Yes

Conflict of Interest: No

Source of Funding: Authors

References

Prevalence and Molecular Detection of Rotavirus in Children in Ramadi City-Iraq

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Abstract

Matter: This is the first study in Al-Anbar governorate with this design aim to the detection of rotavirus group A (ROV A).

Method: A total of (150) stool samples obtained from children <5 years with acute gastroenteritis were randomly collected from Maternity and Children at al-Anbar governorate from (1-9-2019 to 1-2-2020); Rotavirus was detected by rapid test for stool samples and real-time polymerase chain reaction for blood and serum.

Results: Out of total 150 stool sample there were 101(67.3%), 49(32.6%) Negative and positive result respectively, from rapid test. The result of RT-PCR from serum & blood were Thirty-one (31)81.57% of (38) samples positive for rotavirus & eight samples were no ct there was Significant value (0.0016)(0.0075) between PCR (blood, serum) test and Rapid test under p<0.05. Based on that RT-PCR was more sensitive & specific than rapid test.

Keyword: Molecular detection, RT-PCR, Rotavirus, children patients.

Introduction

Rotavirus is transmitted as a result of contamination of the hand with the stool of infected people, and then it reaches the mouth or respiratory system¹²,³,⁴ Rotavirus (RV) infects small intestinal epithelial cells, inducing severe diarrhea in children, resulting in over 500,000 deaths annually.⁵ The virus replicates in the intestinal villi cells⁶ this replication decreases the ability of the intestine to absorb salts and water.⁷ The symptoms often start with fever, nausea, and vomiting, followed by abdominal cramps and frequent watery diarrhea, which may last for 3-8 days. Infected children may also have a cough and runny nose.⁸,⁹,¹⁰,¹¹,¹²,¹³ Generally, reinfections are common in Rotavirus disease.¹⁴ Immunity develops with each infection, so subsequent infections are less severe; adults are rarely affected.¹⁵ Because of the frequency of the virus in the winter season, it was called winter diarrhea before the virus was discovered.¹⁶,¹,⁹,¹⁷,¹⁸,¹⁹

Rotavirus is the second cause of death in newborns and the cause of more than half of cases of acute diarrhea according to the WHO report²⁰ because no specific antiviral therapy is available, effective RV vaccines are crucial to prevent morbidity and mortality. Treatment of RV infection is only possible through fluid and electrolyte replacement, as no specific antiviral therapy is available.²¹

In 2009, WHO recommended the introduction of RVA vaccines into the routine immunization programs, and despite evidence that these vaccines provide good protection against hospitalizations, the acute gastroenteritis morbidity associated to RVA Internationally, oral rotavirus vaccines available (RotaTeq and Rotarix) ²² Rotarix (RV1 product from one strain G1P [8] strain is used as a human vaccine in two doses, RotaTeq (RV5) resulting from combining five strains (G1, G2, G3, G4, and G1P[8])., is used as a vaccine in three doses.²³ Early diagnosis of Rotavirus gastroenteritis in hospitalized patients will decline the morbidity and mortality impressively and avoids keeps away from improper utilization of anti-toxins in pediatric patients.¹⁴ Rotavirus infection is not routinely
diagnosed in Al-Ramadi hospitals probably due to the cost of its diagnosis and because the clinical spectrum of signs and symptoms are similar to other gastroenteritis infections\textsuperscript{24,25}. There is a need for regular detection of RV strains because this information is needed to interpret the results of vaccine studies and epidemiologic surveillance \textsuperscript{9}.

This is the first study in Al-Anbar governorate with this design aim to the detection of rotavirus group A (ROVA) & evaluation methods of detection, initially with a rapid test (immunochromatography) for rotavirus in stool specimen, secondly, by molecular methods RT-PCR. In the other side, we were finding out the epidemiology of rotavirus in AL- Ramadi city in Al-Anbar governorate.

**Method**

Stool samples were collected from children aged less than 5 years, admitted with acute gastroenteritis to hospitals or outpatient wards, a total of (150) stool samples obtained From (1- 9-2019 to 1-2-2020), from children<5 years with acute gastroenteritis were randomly collected from Maternity and Children at al-Anbar governorate.

Detection of Rota Virus by Rapid Chromatographic Immunoassay, The chromatographic immunoassay performed to the first method that we used to detect the rotavirus in stool samples according to (Qingdao High top Biotech Co.Ltd, China).

We were extracted RNA of 38 samples (serum & blood) according to manufactured company (VIASURE RNA –DNA Extraction Kit) protocol Spain.

Samples were stored in clean Eppendorf tub at deep freeze; kit of extraction was stored at room temperature RT (15-30°C) until the day of the experiment, any lyophilized or dissolved substance must be stored at -20°C (like carrier RNA, Proteinase K) and wash buffer at RT.

After preparing our samples, kits and devices; there were initial steps before isolation RNA according (manufactured company (VIASURE RNA –DNA Extraction Kit) protocol Spain.):

Isolation genomic RNA of rotavirus from serum blood samples according (manufactured company VIASURE RNA –DNA Extraction Kit) protocol Spain.:

- **Real-time PCR detection of Rotavirus according** (The protocol of DNA & RNA RT-PCR kit by VIASURE Company – Spin)

**Statistical Analysis:** All results were conducting statistically on SPSS Ver.22. Frequency distribution and percentage for selected variables were done first. \textsuperscript{26} For all statistical analyses, sig. represent P (Probability) value in every table, a P value of less than 0.05 was considered statistically significant. For comparison between variables, we used the Pearson Correlation Coefficient, which ranges (-1 to +1); a positive value means direct correlation & negative value means reverse correlation. & we used Chi-square to compare between the variable. Sensitivity & Specificity were done by MedCalc® v19.5.2.

**Results and Discussion**

**Description of the study sample:** Rotavirus is still the main cause of diarrhea in children. The World Health Organization has indicated that more than half a million children under the age of five face death as a result of contracting rotavirus, and most of them are from poor countries. \textsuperscript{27}

The study included 150 samples from children less than 5 years which suffering from diarrhea, the results were 101(67.3%), 49(32.6%) Negative and positive result respectively, in the rapid test in the stool. The study samples- amounting (150) samples suffering from diarrhea-were collected in the laboratories of the Maternity and Children Hospital in the city of Ramadi, in Anbar governorate, for the period from 1- 9-2019 to 1-2-2020. Samples were rapid test & RT-PCR.

The present study aims to evaluate detection methods of rotavirus; to contribute as much as possible to the use of the fastest and most accurate method for early detection of the virus, and to provide the necessary treatment to save the lives of children in Iraq, specifically in Anbar Governorate.

**Rapid test Results:**

**Prevalence & Influence of Age:** The study showed that out of 150 fecal samples, 49 of them infected children (ROV+ positive) with ratio of 32.6% and the other 101 samples were healthy (ROV- negative) with a ratio of 67.3%. The table 1 also shows that there was no significant statistical difference when comparing the means of age between positive and negative sample
Table 1: The percentage of the number of children infected with rotavirus compared to the age Mean.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Rapid test</th>
<th>No.</th>
<th>Percent</th>
<th>Mean±SD</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ROV+</td>
<td>49</td>
<td>32.6%*</td>
<td>11.286±7.5360</td>
<td>.992</td>
</tr>
<tr>
<td></td>
<td>ROV-</td>
<td>101</td>
<td>67.3%</td>
<td>11.267±12.557</td>
<td></td>
</tr>
</tbody>
</table>

This result corresponds to a study conducted in 2018 Ramadi (32%) study in Baghdad showed that thirty-three per cent of all collected samples have positive Rotavirus, and prevalence of 32.2% in Kaduna State, Nigeria. with a median of 30% in Saudi Arabia. And 30.3% in Baghdad (2018). In Jordan, Rotavirus was detected in 35% of children hospitalized with acute gastroenteritis 39% in 2012 in Anbar. 33% in Baghdad(2016). But not corresponds to a study in Al-Diwaniyah, 2019 there results recorded the incidence of 40%.42 In the region of Mid Iraq.43 In Thi-Qar 2019 45%.44 In Babylon city is 48%.33 The reason for the presence of Rotavirus infection in Iraq and neighboring countries despite the use of the vaccine is the emergence of new genotypes and new strains not included in the vaccine, and this is due to the nature of the genome virus of re-assortment while in Ethiopia 20.4% for rotavirus infection RV-associated diarrhea of 25.6%, Brazil.41

**Influence of Age group:** Table 2 shows that the number of infected children within the age group 1-12 months is 35 children, at a rate of 71.4%; the table also shows 12 infected children in age group of 13-24 months by 24.4 % percent and 2 children at rate of 4 in the 25-60 months out of a total of 49 children. We were found that the stag less than a year was the highest average of infection.

**Table 2: percentage of children infected with rotavirus, depending on age group**

<table>
<thead>
<tr>
<th>Age stages</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-12 m*</td>
<td>35</td>
<td>71.4</td>
</tr>
<tr>
<td>13-24m</td>
<td>12</td>
<td>24.4</td>
</tr>
<tr>
<td>25-60m</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>100</td>
</tr>
</tbody>
</table>

*: Month

This results agreement with Another study, in Ramadi City, Iraq, Babylon City study and with the study. Group of 7-12 months. Others disagree with the study showed that half of the children were below 6 months of age, 37% in the age group of 7-12 months. Another study. The occurrence of rotavirus diarrhea in this age group is probably due to the absence of breastfeeding.

**RT-PCR results:** The limitation of antibody-based tests for the detection of enteric pathogens is the requirement of high concentration of free antigen to generate a positive reaction; the free antigen is decreased significantly during disease. Therefore, these tests have lower sensitivity and could miss positive samples collected late in the course of clinical disease, when compared to RT-PCR.

Thirty-eight (38) samples (21) serum samples & (17) blood samples were detection for RT-PCR after extraction their RNA in the Biotechnology and Environmental Centre University of Fallujah. Thirty-one (31) of (38) samples were positive for rotavirus & eight samples were no ct. As in Table 3

Table 3: The result of RT-PCR from serum & blood.

<table>
<thead>
<tr>
<th>Type of samples</th>
<th>Positive</th>
<th>%</th>
<th>No ct</th>
<th>%</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum</td>
<td>14</td>
<td>66.66%</td>
<td>7</td>
<td>33.33%</td>
<td>21</td>
</tr>
<tr>
<td>Blood</td>
<td>17</td>
<td>100%</td>
<td>0</td>
<td>0.0%</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>81.57%</td>
<td>------</td>
<td>------</td>
<td>38</td>
</tr>
</tbody>
</table>

Our study showed that (81.57%) positive for RV which consistent with study showed that 80.6% among children < 5 years in Diyala province, and with (93.8%) of positive for RV antigen detected by conventional RT-PCR in Diyala, Iraq, with the study And with study which detects rotavirus from NSP3 gene.
In addition to positive control which it was reading (26.01) in the FAM filter & (24.9) in HEX (JOE) filter. The results of samples were reading in the same two filters (according to the protocol of manufactured company).

In the present study we counted on Ct value <40 according protocol of manufactured company of kit to detection positive results corresponding with 39.

In Figure 1: Carves of amplification were explaining the number of the cycle in (X-axes) vs. intensity in (Y-axes). Fluorescence data (FAM) collection during 60°C extension for rotavirus, their curves higher the threshold line were positive results and the negative result the curves under threshold line in RT-PCR for rotavirus detection 47.

**Sensitivity & Specificity:** Our study showed (Table 4) that from 14 stool samples, there were 12 true positive (TP) samples and 2 false negative (FN) samples as a result of rapid test while for same 14 samples, all their serum in the RT-PCR test were positive and there is no result of false positive (FP), nor a true negative (TN).

<table>
<thead>
<tr>
<th>PCR serum test</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>__</td>
<td>+</td>
</tr>
<tr>
<td>Rapid test</td>
<td>Count</td>
</tr>
<tr>
<td>%Within rapid test +</td>
<td>85.7%</td>
</tr>
<tr>
<td>Count</td>
<td>2 FN</td>
</tr>
<tr>
<td>%Within rapid test _</td>
<td>14.2%</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
</tr>
<tr>
<td>%</td>
<td>100%</td>
</tr>
</tbody>
</table>

The sensitivity of PCR serum test = TP/TP+FN *100 = 12/14*100 = 85.7%
Specificity of PCR serum test =TN/FP+TN *100 = 0/0*100 = no specificity

Result of Chi-squared between RT-PCR (serum samples) test and rapid test was (7.143) at DF (1) and there was Significant value (0.0075) under p<0.05.

In the present study (Table 5) that from 17 stool samples, there were 15 true positive (TP) samples and 2 false negative (FN) samples as a result of rapid test while for same 17 samples, all their samples in the RT-PCR test were positive and there is no result of false positive (FP), nor a true negative (TN).
Table 5: Compared result between RT-PCR (blood samples) test and rapid test

<table>
<thead>
<tr>
<th></th>
<th>PCR blood test</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Rapid test</td>
<td>Count</td>
<td></td>
</tr>
<tr>
<td></td>
<td>%Within rapid test +</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 TP</td>
<td>0 FP</td>
</tr>
<tr>
<td></td>
<td>88.2%</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Count</td>
<td></td>
</tr>
<tr>
<td></td>
<td>%Within rapid test _</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 FN</td>
<td>0 TN</td>
</tr>
<tr>
<td></td>
<td>11.8%</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

The sensitivity of PCR blood test = TP/TP+FN *100 → 15/17*100 =88.2%
Specificity of rapid test =TN/FP+TN *100 → 0/0*100 =0% no Specificity

Result of Chi-squared was (9.941) at DF (1) and there was Significant value (0.0016) between PCR blood test and Rapid test under p<0.05.

In our study showed that sensitivity and specificity of PCR serum samples were 85.7% and no specificity, respectively than Rapid test, sensitivity and specificity of PCR blood samples were 88.2% and no specificity, respectively than Rapid test, based on that RT-PCR was more sensitive & specific than rapid test.

RT-PCR has replaced the conventional methods since; they are rapid, accurate and also having good sensitivity and specificity 14.

Conclusion:

- Rotavirus continues to threaten the lives of nearly one third of children in Ramadi city.
- Children under one year of age are more likely to be infected with rotavirus, especially males.
- There was correlation between RT-PCR test and rapid test.
- RT-PCR more sensitive than Rapid test.

Conflict of Interests: The authors of this paper declare that he has no financial or personal relationships with individuals or organizations that would unacceptably bias the content of this paper and therefore declare that there is no conflict of interests.

Source of Funding: The authors have no sources of funding, so it is self-funding research.

Conflict of Interest: None

Ethical Approve: We declare that the study does not need ethical approval.

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The Psychological Health and Social Impacts of Constitutional Court’s Verdict No. 97/PUU-XIV/2016

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Abstract

After the Constitutional Court’s Verdict No. 97/PUU-XIV/2016, acolytes of beliefs have electronic identification cards and family cards which say, “Belief towards the Almighty God” in the “religion” column. In this case, the status of the acolyte of beliefs’ existence is more acknowledged administratively in Indonesia. The research method used in this study is the normative-empirical research method. The data is collected using the literature study and interview methods. The aim of this research is to know how the psychological and social impacts of the Constitutional Court’s verdict are. This research finds that the acknowledgement of this status gives psychological and social impacts towards the life of the acolytes. The psychological and social impacts of the Constitutional Court’s Verdict happened to the uncertainty and doubt of the acolytes. If they change their statuses, they will face many problems and they must leave the comfort zone they have stayed at for so long. This research has value as the “religion column” is sensitive and results to impacts in Indonesia.

Keywords: Constitutional court, acolyte of beliefs, juridical, social, impacts.

Introduction

The Constitutional Court’s Verdict No. 97/PUU-XIV/2016 regarding the examination of the Constitution No. 23 of 2006 regarding the Citizenship Administration, as what is changed with the Constitution No. 24 of 2013 regarding the change of the Constitution No. 23 of 2996 regarding the Citizenship Administration regarding the Republic of Indonesia’s 1945 Constitution states that the stipulations of Article 61 clause (1) and clause (2), also Article 64 clause (1) and clause (5) regarding the void of the “religion” column in Family Card and the electronic Identification Card which is against the constitution.(1)

The consequence of the Constitutional Court’s Verdict is that the acolytes of traditional beliefs can now publish their beliefs in the “religion” column both in the Family Card and the electronic Identification Card. The basis of the Constitutional Court’s Verdict is that the rights to become a follower of a religion or a belief towards the Almighty God is a constitutional right of the citizens. The basis of the state’s responsibility to protect all streams of beliefs in Indonesia is the stipulations of Article 28I clause (4) which states that, “The protection, development, enforcement, and fulfillment of the human rights is the responsibility of the state, especially the government.”(2)

With the understanding which is constructed using lexical interpretations, the Constitutional Court uses it as the initial basis in understanding the position and the relations between “religion” and “belief” as stated in Article 28E clause (1) and clause (2) and Article 29 of the Republic of Indonesia’s 1945 Constitution. Then, to affirm the interpretation above, the Constitutional Court reviewed those articles’ formulation history. The Constitutional Court then concludes that based on the formation process of Article 29, Article 28E clause (1) and clause (2) of the Republic of Indonesia’s 1945 Constitution, “religion” and “belief” are regarded as separate things, as the two are regulated in two different clauses. It’s just that, by regulating “religion” and “belief” in two different norms, it can be said that the
Republic of Indonesia’s 1945 Constitution basically regards “belief” as different from “religion”. Because of this, on one side, “religion” and “belief” are regarded as separate things, as they are regulated in Article 28E clause (1) and Article 28E clause (2). But, on the other side, “belief” is also understood as part of the religion as stated in Article 29 of the Republic of Indonesia’s 1945 Constitution. Further, the term “religion” in Article 61 clause (1) and Article 64 clause (1) should be defined as part of “belief” so that it is according to the norms in Article 1 clause (3) of the Republic of Indonesia’s 1945 Constitution. Legally, it is very reasonable, so that the two articles do not contradict one another with the principles of law certainty and non-discrimination (same treatment in the face of law) as guaranteed in Article 28D clause (1) in the Republic of Indonesia’s 1945 Constitution. It also violates the citizens’ guarantee of equality in the face of law as stipulated in Article 27 clause (1) of the Republic of Indonesia’s 1945 Constitution.

Method

The research method used in this study is the normative-empirical legal research method. The data is collected using the literature study and interview methods. This is a qualitative research. The analysis is carried out towards the data from the introductory study results or secondary data. The analysis of the qualitative data in the field was carried out using the Miles and Huberman analysis models(4), which include data reduction, data model, verification or conclusion. In this qualitative research, the data analysis was carried out simultaneously with the data collection process.

The data analysis used is the descriptive-qualitative and explanatory analyses. The research results are described in narratively, which explains and describes the objects analyzed.

Discussion

Psychological Impact: Interpretation of the streams of belief outside of the government-acknowledged official religions which are Hinduism, Buddhism, Islam, Christianity, Catholic, and Kong Hu Chu; or the formal legality of the various belief streams which exist in Indonesia, is an Indonesian cultural heritage which are spiritual and mystical(5). The law which regulates the survival rights of the belief streams are defined as the freedom which is still in the boundaries of tolerance. It is so that there is harmony in the life of people in practicing their religions and beliefs. Plus, in carrying out their activities, the followers must comply with the constitutional regulations which apply, so that there is no emergence of social and legal issues.

There is the impression of ambiguity and contradiction between the regulative conceptions regarding the protection, respect, and fulfillment of the rights of religious and belief freedom in Indonesia; remembering that on one side, the state formulates a regulation which gives an affirmation that the rights for the freedom of beliefs and religion are non-derogable rights which cannot be decreased in any condition. There must not be discrimination, and the state has the responsibility in respecting, fulfilling, and protecting it. But, on the other side, the state also stipulates regulations which limit, decrease, and revoke the rights for the freedom of religion and beliefs. The dimension of the human rights legal regulations is on one hand universal and non-discriminatory. But, on the other hand, the dimension of the human rights law conception is particular and discriminative.(6)

The existence of the stream of belief acolytes in Indonesia has been legally and formally regulated in some constitutional regulations. Some of these regulations actually indicate two things, which are: (1) the formal existence, as mentioned in Pancasila, the Republic of Indonesia’s 1945 Constitution Articles 28E, 29, and 32, the Constitution No. 23 of 2006 regarding Citizenship Administration, and the Governmental Decree No. 37 of 2007 regarding the Implementation of the Constitution No. 23 of 2006 regarding Administration, and (2) the existence of the belief acolytes, especially regarding the history and the individual awareness of each acolyte.

According to the Director of the Belief to the Almighty God and Tradition, General Director of Culture, the Ministry of Education and Culture, Sri Hartini, in Indonesia there are around 12 million acolytes and followers of beliefs which are spread in 26 provinces, with 187 central-level organizations and 1.034 branches. The coaching for the belief acolytes were carried out based on the Presidential Decree No. 27 of 1999. On the New Order Era, based on the Outline of the State’s Direction (GBHN), the beliefs of the local religions are categorized into the stream of beliefs. At that time, the coaching of the stream of beliefs were directed so that they come back to the origin of each religion. At the New Era governmental period, a policy was issued which directs the local religions to join in the religion in which its teachings are similar to the mothering
religion (the majority’s religion). Some local religions such as Kaharingan (Dayak tribe, Borneo) and Aluk To Dolo (Tana Toraja tribe, Sulawesi) were merged into Hinduism. The Kong Hu Chu religion was merged into Buddhism. With the repressive governmental policies at that time, thus, to save the followers of the local religions which were approved by the government thus the feels psychological oppressed.\(^7\)

The formal existence of the belief stream followers towards the Almighty God has been formulated in the 1945 Constitution and the 1998 Outline of the State’s Direction, even though there are still some fundamental deficiencies. The Constitution’s mandate, as stated in Articles 28E and 29 has affirmed that the legal basis and the survival rights of the streams of beliefs in Indonesia gives a social reality aside from the existing religious institutions. Thus, the streams of belief obtain the human rights protection with the freedom to embrace a belief which is according to their conscience. They also have the freedom to create organizations.\(^5\)

**Social Impacts:** Still questions whether or not the Belief towards the Almighty God is a religion. This doubt must be given clarity, so that there are no conflicts between the belief acolytes and other members of the society. According to Endang, a belief is a manner of believing in God. The belief acolytes are administratively acknowledged, as it is allowed for the acolytes to publish their beliefs in the “belief” column in the electronic Identification Card or Family Card.\(^8\) Yet, in its development, not all belief acolytes have changed the status in their electronic Identification Cards or Family Cards into the belief they have. This may be caused by the family, work, social environments, or others. There are some belief acolytes who are in a family environment which embraces a certain religion. Thus, to maintain the peace in the family, that acolyte have not proposed for the electronic Identification Card or Family Card status change. This is because from the start, that person had a religion.\(^9\)

There are also some people who are raised in a family which acknowledges and embraces both religion and belief. The parents and the children both have two beliefs, which are as embracers of a religion and as acolytes of a belief. Usually, those people have electronic identification cards which state one of the valid and acknowledged religions in Indonesia. Thus, this type of people doesn’t feel the need to propose to have their belief stated in the electronic Identification Card or Family Card as they are comfortable with the status quo. From the start, they already have both a belief and a religion.

The work environment factor may also become the obstacle of the belief acolytes to change their status, considering that the change of status may change the employment administration data. Usually, the acolytes who have the status as Civil State Employees have written one of the valid religions in the electronic Identification Card or Family Card.

In the case of citizenship administration, MLKI returns this to each individual. They may or may not change the status in the electronic Identification Card or Family Card.

According to Endang, even though the belief acolytes write one of the religions in the electronic Identification Card and Family Card, they are actually belief acolytes who are true followers. Usually, the faith of the belief acolytes is very strong. This means that the belief acolytes do not want to carry out the rituals or worshipping methods of other religions or beliefs. The case where an acolyte of an “A” belief converts to become the acolyte of a “B” belief very seldom happens. This is what actually makes the bond between the belief acolytes in a faith very strong. Thus, the belief acolytes are also reluctant to preach to acolytes of other beliefs to join their belief. The belief acolytes use the Javanese principle which is popular in Javanese language, which is, “timbo sing marani sumur duduk sumur marani timbo”. It means that the belief acolytes do not preach. They only give examples from their actions. They are welcome to those who believe or those who want to follow. But the belief acolytes do not carry out a particular missionary endeavor.\(^10\)

So, basically, the Belief towards the Almighty God is mostly as described. There is the principle that when someone is a follower of a particular belief, he/she should not show it nor should he/she act proud about it. But, if someone asks about it, they will answer the questions. In the Yogyakarta Special Province, there are Belief Associations which are open to public, such as SaptoDarmo.

Most beliefs in Indonesia do not have a Book of Teachings which are documented in the form of books, because there are some prohibitions from writing down or documenting the teachings. The teachings from the
ancestors may only be memorized. It is not allowed to be written down. The MLKI of Yogyakarta Special Province has suggested the Belief Associations to write down their teachings. But there are still associations which do not want to write them down, as they believe that the teachings cannot or may not be written down. This makes it difficult for the MLKI in the Yogyakarta Special Province to create the belief profiles.

Socially, the issuing of the electronic identification cards and family cards which include the belief has some advantages and disadvantages, according to Endang. The advantage is that the belief acolytes whose spirits are strongly attached to the belief will change their statuses. The minus is that there are those who doubt the need to. They worry that they may face problems if they change the status. This worry is usually caused by the social environment factor.

Actually, all governmental institutions are already very opened. They accept the participation of the belief acolytes in the government, and there are no more discriminations, so there’s nothing to worry about. The acolytes are also accepted as members of the People’s Representative Council of the Region, legislative candidates in the 2019 general election, and the Head of the Region candidate, like one of the Surabaya Mayor candidates who embraces SaptoDarmo. Thus, the General Election Commission has treated all candidates equally and without discrimination.

**Conclusion**

The Constitutional Court has pushed the government to issue some constitutional regulation instruments with the aim to give equal services and protection to the Belief Acolytes. The Belief Acolytes experience psychological and impacts in the aspects of citizenship, education, marriage, and institution of the Belief Acolytes. The inclusion of the belief in the electronic identification cards and family cards makes the Belief Acolytes more opened and accepted by the society. They admit their belief in the society. The society also starts to believe that the Belief towards the Almighty God is a belief which must be respected. The impact in the psychological of acolytes is excellent.

**Conflict of Interest:** No

**Source of Funding:** Authors

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Psychological Obstacles of the PTUN Judges and Regulatory Reconstruction of the DKPP Verdict in Enforcing the General Election Organization Code of Ethics

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Abstract

Verdict of the DKPP in Article 458 clause (13) in the Law No. 7 of 2017 on the General Election is final and binding. Yet, the implementation stage of the “final and binding” phrase causes multi-interpretation. Thus, there are some verdicts of the General Election Honorary Organizing Council (DKPP) which underwent legal efforts to the State Administration Court (PTUN). As a form of ius constituendum, the writer suggests that there should be a regulatory reconstruction on the verdicts of the DKPP in upholding the code of ethics in organizing the general election, by classifying that the verdicts of the DKPP is an ethical verdict; thus it is not proper to be corrected by the legal verdict in the PTUN. The room for correction will be opened by mandating it to the Court of Ethics. The ethical verdict corrected in the PTUN will risk the judges’ independence. It is highly possible that they will experience psychological pressure in making a verdict on the general election ethic violation in their capacity as Civil servant (PNS) who are institutionally under the Ministry of State Apparature Empowerment (Menpan), which specifically the minister is a political official which is chosen by the president.

Keywords: Reconstruction, DKPP Verdict, Code of Ethics in establishing the General Election, and Psychology of Judges.

Introduction

This research is entitled the regulatory reconstruction of the DKPP verdict in upholding the code of ethics in establishing the general election and also the psychological obstacles of the State Administration Court. The legal problem starts from the blanked norm in Article 458 clause (13) of the Law No. 7 on 2017 on the General Election. This article states that, “The verdict as aforementioned in clause (10) is final and binding.” In the explanation of that Article, it has been clearly stated that from the phrase “final and binding”, the DKPP verdict must be implemented by the president, the General Election Commission (KPU), the Provincial General Election Commission (KPUD), the External Monitoring Body (Bawaslu), and the Provincial External Monitoring Body (Bawaslu Provinsi).

Based on the writers’ observation, the parties which carry out legal efforts to the PTUN uses the basis of the Constitutional Court Decree No. 31/PUU-XI/2013¹. The Constitutional Court Decree basically explains that the DKPP verdict is binding to the president, the General Election Commission, KPUD, the City/Regency General Election Commission, and the External Monitoring Body, but not final to the justice-seekers².

On one side, in the perspective of the state administrative law, the Constitutional Court’s Decree may be understood. But, from the aspect of the State Administrative Law, the writer believes that it is improper to position the DKPP the same as other State Administration organs.³ and also the independence in ethical decisions. The DKPP verdict which cancels the general election organizer, from the KPU or Bawaslu due to the ethical codes, cannot directly be applied.

If the legal effort to the PTUN is deemed as correct, thus the PTUN Verdict will in the end be measured and evaluated based on the truth according to the legal perspective. It will be decided upon with the risk of the PTUN judges’ lack of independence as PNS who
are under the Menpan. There is a high chance for psychological pressure. Apart from that, this is because the DKPP ethical code assembly is psychologically more independent than the PTUN trial judges. This is because the former is not under the government, which is different from the latter, who has the capacity as PNS.

The problem which arises regarding the DKPP verdict is that if this is allowed, it will cause an uncertainty of law. The number of KPU which carry out legal efforts to the PTUN will also increase, as every DKPP verdict is issued with the order to lay off a general election organizer. Then, the laid off general election organizer will directly carry out legal efforts to the PTUN. This precedent becomes improper when the government (which is affiliated with the parties in power) have a great potential to pressure the PTUN judges who are PNS with the excuse of loyalty.

**Research Method**

This is a legal-normative research. The function of a legal research is to obtain coherent truth, which is seeking suitability between the analyzed object and the referral regulations and principles. The approaches used in this research are the statute approach, the case approach, the historical approach, and the conceptual approach.

**Discussion**

Due to the complexity of issues in organizing a general election, it is not enough to only depend on legal principles to achieve a good organization of the general election. Yet, it must be completed with ethical codes. This is necessary to create a demand to the public officials so as to have a high moral standard, so that they may maintain the trust of the people.

The main source of this conflict is the unclear regulations on the DKPP final verdict’s character in Article 458 clause (13) of the Constitution No. 7 of 2017. The phrase “final and binding” in the implementation stage has issues. Based on the results of the research, until February 2020, there are twenty-two cases of DKPP verdicts brought to the PTUN for legal efforts, as obtained from a personal communication with the Head of the Court Section, DKPP, Republic of Indonesia (February 2020).

In the processing stage in the PTUN, there were eighteen verdicts related to the DKPP verdicts. From that number, fourteen were granted, four were rejected. In the cassation stage in the Supreme Court, there were sixteen verdicts regarding the DKPP verdict execution. From that number there were ten KPU laid off by the DKPP who then won in the Supreme Court stage. Then, six cases were rejected.

The writer suggests that the DKPP existence with the final character of its ethical verdict is a form of innovation on some of the general election issue complexities. Meanwhile, regarding the perspective which positions the DKPP verdict correctable by the PTUN, it is sourced from the inextensive thought on the judicial power, where the judicial poers is only based on Article 24 clause (2) of the 1945 Constitution.

If it is only based on Article 24 clause (2) of the 1945 Constitution, thus there is a perspective that the DKPP only has a position as an organ of the State Administration. Thus, their products are included as part of the State Administration verdicts. Yet, it must be observed that in Article 24 clause (2) of the 1945 Constitution, it also states, “Other bodies whose function is related to the judicial power is regulated in the constitution.” The idea to give a room for the DKPP verdict correction to the Court of Ethics may be deemed as legally correct. This is because apart from the fact that the formation of the DKPP is strengthened by the Law No. 7 of 2017 on the General Election, according to the writer, this Council also has a constitutional basis, which is Article 24 clause (3) of the Constitution of 1945.

The DKPP verdicts on the general election ethical violation is related to the political interests of the general election participants. Meanwhile, the status of the DKPP assembly is not a governmental organ, thus it is psychologically possible to be independent. The contrary happens if the DKPP verdicts are then corrected by the PTUN judges who tend to have their position intervened as PNS. They are psychologically under the influence of the government in political issues by the parties in power of the affiliated power. Judges who are psychologically under pressure will not be able to decide clearly and objectively.

This is because a good verdict of the judges must contain three main considerations, which are the philosophical justice, the sociological justice, and the judicial justice, which cannot be obtained if the judge is psychologically pressured in their capacity as a PNS.

The improper DKPP verdicts are brought to the
PTUN for legal effort, as this Court is part or an organ of the government. Thus, hierarchically, the position of the PTUN judges is under the Menpan. Then, psychologically, the independence of this court’s judges will be disturbed in deciding upon the ethical issues in establishing the general election. There are some aspects which are currently related to the judicial position, such as the judge recruitment, financial rights, career path/stratification according to the rank, and facilities, which still follow the regulatory standard of civil servants (PNS), as state by Marzuki. Such position will psychologically cant maintain themselves from the intervention of authority. Giving a room to correct the DKPP verdict to the PTUN is the same as opening a room for intervention.

The writer suggests that the formation of the DKPP is part of a legal innovation on the general election. According to Oemar Seno Adji, “A court which is independent and uninfluenced are indispensable requirements for a state of law”. Independent means that there is no intervention from the executive and legislative powers in carrying out the judiciary functions. According to Bagir Manan, the judicial assembly which is deemed as unneutral or taking sides may be due to the influence of power, where the judicial assembly is psychologically powerless in facing the wills of those in higher power. The judges of the PTUN also face a psychological dilemma in facing the governmental influences when deciding upon the ethical code verdicts of the KPU in their status as PNS who are bound with their obligation to be loyal to the government (in this case the parties in power of the coalisions in the government).

Based on the description above, it can be concluded that justice will be better enforced if supported by a system of law and a system of ethics where both synergize to uphold justice. In the rule of law system exists the code of law, which is equipped with the court of law or a law-enforcing institution (the legal court). Also, in the rule of ethics, there is the code of ethics which surely needs the court of ethics, which is an institution which upholds the ethics.

Then, regarding the interpretation of the DKPP verdict which is final and binding in Article 458 clause (13) of the Law No. 7 of 2017 and also impact of the Constitutional Court decree No. 31/PUU-XI/2013 which has caused some problems, the general election legal frameworks should be formulated as comprehensively as possible, so as to avoid multi-interpretation. It is so that it may easily be understood. It must answer issues regarding the general election to create and to make sure that the general election runs democratically.

The writer suggests that the DKPP verdict has an important relation to the quality of the organization and the result of the general election. So, apart from the urgency of the regulation on the DKPP verdict’s final character, there should also be a room for appeal on this verdict. According to the writer, this thought is in line with the ratio decidendi or the legal consideration in the Constitutional Court Decree No. 31/PUU-XI/2013, because in this decree, the Constitutional Court principally states that the the DKPP verdict is binding to the president, the General Election Commission (KPU), KPUD, the City/Regency General Election Commission, and the External Monitoring Body.

Departing from the thoughts above, it should be noted that the room for appeal is not the room for legal appeal by the PTUN. But it is the ethical appeal room by the ethical court, which in this case is the Court of Ethics. The writer believes that the room for appeal or correction is important to be opened to make sure that the DKPP is more careful and accurate in issuing a product of verdict.

The influence of governmental power in the PTUN opens the chance for misuse of power by the government regarding the handling of the general election code of ethics violation for the sake of power. The PTUN judicial power is constitutionally predicted to not be able to give a verdict without psychological pressure, considering that their status as PNSs are subordinantes of the government. The judges’ status as the PNS makes it possible for intervention of the judicial freedom, because the structural psychological, corporal, and bureaucratic characteristics bring or demand certain bindings.

In the context of the DKPP verdict regulations, the writer agrees that appeal may only be carried out on one stage, and it must be carried out by the ethical institutions instead of the legal ones. Based on that, the DKPP verdict regulatory reconstruction in upholding the ethical codes of the general election organization becomes urgent.

1. **Reconstruction of the Law No. 7 of 2017 on the General Election:** There should be a revision on Article 458 clause (13) on the Constitution No. 7 of 2017, which states that the DKPP verdicts are final
and binding. The writer suggests that the “final and binding” phrase should be changed into, “The DKPP verdict must be implemented by the president, the General Election Commission, KPUD, Bawaslu and the Provincial External Monitoring Body.”

After there is an addition to that article, there should be two new clauses, which are clause (14) and clause (15). On clause (14) it should state that if there are parties who object the verdict as aforementioned in clause (10), an effort of ethics may be brought to the Court of Ethics. Then, on clause (15), it should state that the Court of Ethics’s verdict on the code of ethic alleged violation as meant in clause (11) is final and binding, and cannot be a case object in the courtly environment of the Supreme Court.

2. Reconstruction of the Law No. 9 of 2004 on the Change of the Law No. 5 on 1986 on the DKPP:
The writer suggests that in the reconstruction, there is an additional criterion that the verdict regarding the DKPP verdict is not included as an object which may be proposed to the PTUN. The regulation regarding the object which cannot be proposed to the PTUN is written in Article 2 of the Law No. 9 of 2004 regarding the change of the Law No. 5 of 1986 regarding the PTUN, which states that, “Those not included in the definition of the PTUN verdict according to this Constitution are as follows:”

First is the PTUN verdict which is an action of the civil code. Second is the PTUN verdict which is a common regulation. Third is the PTUN verdict which is a final regulation. Fourth is the PTUN verdict which still needs approval. Fifth is the PTUN verdict which is issued based on the stipulations of the criminal code and the code of criminal law procedure or other laws which have the character as criminal codes. Sixth is the PTUN verdict regarding the administration of the Indonesian National Army. Seventh is the verdict of the General Election Commission. Based on the seven exceptional verdicts above, the writer suggests that an additional criterion is added, where that criterion should be placed in Article 2 letter h number eight.

**Conclusion**

An ethical verdict is different from a legal one. This is because the institutions which issue them and the references which become their bases are also different. Thus, it is not proper to investigate the validity of an ethical verdict – which is sourced from ethical principles – at the PTUN, in which the basis is the legal principles.

The revision of the General Election law is necessary to state that the DKPP verdict must be implemented by the President, the General Election Commission, KPUD, the External Monitoring Body, and the Provincial External Monitoring Body. The room for correction or the cassation of the DKPP verdict will be carried out by the Court of Ethics instead of the PTUN, as the latter has a psychological obstacle in handling the cases on the general election code of ethics violation as a PNS. These judges will psychologically have trouble if the government then intervenes or pressures them to make decisions regarding the general election code of ethics violation which menguntungkan the parties in power or the coalitions in the government.

**Source of Funding:** Author

**Ethical Clearance:** Yes

**Conflict of Interest:** No

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The Eradication of Women and Children Trafficking in Jember Regency in Relations to the Legal Protection for Victims in the Health Perspective

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Abstract

The development of human trafficking has changed to happen to the kinds of people who are disadvantaged, such as woman and children. The trafficking of woman and children is one of the bad forms treatment from the exploitation activity which is faced by woman and children. Trafficking is included as a crime and a human rights violation. Indonesia itself is a region where woman and children trafficking happens, either as country of the victims’ origin or as a transit country. Some regions in Indonesia are estimated as targets of border countries’ crime syndicate activities which organize woman and children trafficking. This research analyzes the women and children trafficking in Jember Regency in the perspectives of law and health.


Introduction

There is an interesting data which is released by the Center for Protection of Women and Children (Pusat Perlindungan Perempuan dan Anak/P3A) Jember. From a quick study conducted by ILO/IPEC on 2003 in East Java, it is shown that 4.081 people under 18 years old are estimated to become victims of children and woman trafficking. This study also stated Jember and eight other areas as places which are signaled to become the original areas of women and children trafficking victims who were to be sold for sex. The eight areas are Banyuwangi, Sampang, Malang, Blitar, Ponorogo, Pacitan, Gresik, and Nganjuk Regencies. Meanwhile, the areas in Jember Regency which are signaled to be the original areas of where the trafficking victims are sent from are Ambulu, Tempurejo, Puger, Arjasa, Patrang and Sumberbaru1.

These days, there are more and more news on human trafficking in Indonesia, both in the domestic and transnational scales. There is only recent attention from the society through the mass media these last years towards the human trafficking of women and children in the sexual industry activity. Surely, it cannot be concluded that before this, the phenomenon did not happen. There is a chance of it happening in a small scale or in a well-organized trafficking activity. This is part of the reason of why the trafficking news did not attract the attention of the mass media in the past2.

Indonesia becomes the state of origin, transit, and destination of human trafficking especially woman and children who are forced to become sexual workers or forced workers. The victims from Indonesia are brought to Malaysia, Singapore, Taiwan, Hongkong, Brunei, countries of the Persian Gulf, and Australia. The trafficking has also happened extensively in the Indonesian territory for sex and labor exploitation. Indonesia becomes one of the destination countries for the trafficking victims who are sold to be sexually exploited3.
Based on the background above, it can be formulated that the research problem is: How is the eradication of the women and children trafficking in relations to the legal protection for the victims?

Result and Discussion

1. The Definition of Women and Children Protection:

   Based on the Constitution No. 21 of 2007 regarding the eradication of Human Trafficking, trafficking is the action of recruiting, transporting, sheltering, sending, moving, or bringing in someone with the threat of violence, the use of violence, kidnapping, captivating, fraud, deception, misuse of power to someone in a disadvantaged position, debt bondage, or giving payment or benefits so that there is the agreement from the person who has power over the stated person, both carried out within the country or between countries, with the aim of exploitation or to make someone become exploited.

   The rampant case of human trafficking in Indonesia causes concerns to its people. There are various cases of human trafficking which happen nowadays based on the news of electronic or non-electronic media. Some of the research results which had been carried out show that the cases of human trafficking, especially those which happen to women and children, require serious attention.

   The women and children trafficking which happen in Indonesia is usually with the aim of bringing them into prostitution. It also regards pornography, begging, or labor as household assistants. The women and children trafficking is a real violation of the basic human rights. It is complex as well as multidimensional and is carried out both blatantly and implicitly. These informations are obtained from the results of reports and data displays from various sources. As stated by Sumaryoto as the Minister of Women Empowerment⁴, to prevent the problem of women and children trafficking, the Indonesian government has carried out some efforts both which are practical and strategic.

2. The Forms of Women and Children Trafficking:

   There are various forms of women and children trafficking. In reality, it is the same as the women and children trafficking which happen in European countries. Yet, to ease the identification, there are some forms or actions which may be categorized as the forms of women and children trafficking based on the research carried out by Syafaat. According to him, the forms of women and children trafficking which happen in Indonesia are as follows:

   1. The adoption of children with the procedures or which are sold to citizens of Indonesia or to foreign citizens.
   2. Involving children in the sales of drugs.
   3. Pornography of women and children.
   4. The trafficking of women and children to work by force.
   5. Forcing women and children to work as beggars or to scrounge in the streets.
   6. Forcing women and children to carry out sexual work or to become prostitutes⁵.

   Then, according to a research carried out by Solidaritas Perempuan (The Solidarity of Women), the forms of women and children trafficking based on the cases found are not limited to forced prostitution or sex trade. Yet, they also include the forms stated by Syafaat.

3. The Factors which Cause Women and Children Trafficking to Happen in Jember:

   The main cause of the rampant trafficking cases towards the women and children in Jember Regency is poverty. People try to fix or to improve their economic condition by looking for work. But, obtaining work is not as easy as what they imagined. Some had to suffer in the process. As stated in the research carried out by Syafaat in East Java, the factors which cause women and children trafficking are as follows:

   1. Difficult economic condition.
   2. Disharmonious family.
   3. Early-age marriage and divorce.
   4. Early-age victim of sexual harassment.
   5. Victim of rape.
   6. Limited work opportunities.
   7. Influence from other people who have successfully worked in various filed. This happens as follows:

   The victims of women and children trafficking are victims who experienced physical and psychological suffering. After the crime is over, they will still experience trauma and long suffering. From the cases of women and children trafficking found, most regard forced prostitution or sex trade. Apart from that, they also regard forms of work prostitution and practices like slavery in some areas in informal sectors including
domestic work and wife-by-order. The victims stated that before they are trafficked, they have already experienced terrible conditions in the shelters. In those places, they are not equipped with skills. Instead, some have already been exploited to work without wage in living conditions which are not feasible, as stated by Fida, a companion of women and children trafficking victims in Jember Regency (personal communication, March 12, 2020).

Jember is divided into 28 districts. They holistically have a great potential for women and children trafficking, through the mediation of agents which come to villages. Usually, the agents as the recruiters directly enter the villages to find and to take women and children to be distributed to other agents as receptors. The victims will then become prostitutes. They may be trafficked to other areas or to other countries.

The modus operandi or the method of running the crime of women and children trafficking is usually through deception. This happens when the victims are influenced by the agents. They want to obtain a high wage, but then they are forced to become prostitutes. Most of the cases which happen in Jember Regency is prostitution.

From the cases of women and children trafficking which happen in Jember regency, the rights obtained by the victims are quite maximum. The victims are brought home if the case is uncovered. Also, if the victims ask for further investigation, this case may be filed to court. Yet, most victims do not want the case to be known extensively by the society as they regard the case as a disgrace. But, the gateway for the entrance of the criminal court process is the involvement of the victims in the criminal court, which is through reports and complaints.

Considering the complexity and the difficulty to detect the criminal act of human trafficking, thus there needs to be a regulation which is more suitable to the current condition. The regulations on human trafficking in the Indonesian constitution, as explained in the background, are not non-existant. Yet, they are deemed as inadequate.

Seeing the extensive definitions of human trafficking, there are no legal articles which can be used to cover all actions which are categorized as human trafficking in the limitations which currently apply according to the international society. If seen from the cases of women and children trafficking which happen in Jember Regency, there are some obstacles related to the legal protection for the victims, which are:

a. The Law or the Regulations: There are some articles which are specifically used to bind the perpetrators of women and children, which are Article 297 of the Criminal Code, Article 324 of the Criminal Code, and Article 329 of the Criminal Code. As explained in the previous part, there are some weaknesses of these articles. Then, the women and children trafficking are more specifically regulated in the Constitution No. 21 of 2007 regarding the Eradication of the Crime of Human Trafficking. With the Constitution No. 21 of 2007, the two articles in the Criminal Code which regulate the trafficking of women and children do not apply anymore. Yet, the existence of these regulations causes new problems for the law-enforcing apparatus, especially in the application of the articles.

The problem which may arise with the application of the new article in the constitution lies in the unclear words used in the formulation of some articles. As stated by Soekanto, this is because the definition of the words used may be interpreted extensively, or because the words used are translated from foreign languages. Thus, one of the obstacles in the law enforcement which comes from the regulations is the unclear words used in the regulations which cause uncertainty in the interpretation and in the application.

b. The Law-Enforcing Apparatus: The law-enforcing apparatus highly require help from many parties, such as reports from the society as an information to uncover a case. Because of that, there are some factors which influence the uncovering of the trafficking case. The lack of the number of personnel, the lack of facilities and infrastructure, and the lack of funds become the police force’s classical excuses in uncovering the cases of trafficking. These limitations are further added with the lack of the investigating personnel’s abilities in uncovering the cases filed by the society. In the investigation process, the police force must have special abilities in handling the trafficking cases.

Based on the results of a questionnaire given by the researcher to 50 police force personnel in the investigation and in the inquiry sections, 11 public prosecutors, 24 technical administrators in the Jember District Court which consists of the judges and the
clerks, it can be concluded that the law-enforcing apparatus generally know about the existence of the women and children trafficking as they have not yet reached an understanding. This is proven by the results of the questionnaires given, considering that there must be special skills in handling the cases of trafficking.

c. The Trafficker: As mentioned before, the traffickers have an extensive network in this crime. Even though accurate evidences had not been found, yet it may be estimated that the perpetrator is a group of people within a certain organization, thus often called an organized crime. Such crimes involve many people and they have a rather extensive network. Thus, it is not impossible that the perpetrators of this crime are very difficult to be caught, even more so to bring them to the legal process.

Usually, their activities are difficult to be mapped out. It is also difficult to find who the real perpetrators are. Even, it is not impossible that they have known the police force’s efforts in catching them. This results to them taking preventive actions, thus they may get away safely. The apparatus must be aware that the perpetrators who are caught are usually small-scale perpetrators or powerless “messengers”. Meanwhile, the intellectual actors in the organized crime will never be caught. And there is an even less chance for them to be processed by the law.

d. The People’s Perception on Human Trafficking:
The problem of human trafficking, especially that which happens to women and children is an example of the women’s disadvantaged condition towards the sexual interests of men. The women’s sexual image which places women as men’s sexual object actually has a high impact towards women’s lives. Thus, they must always face physical and mental violence, coercion, and torture. Because of that, the women and children trafficking is not only a reflection of the women’s image as a sexual object, but it also reflects women as men’s object of power. The weak position of women and children is actually a consequence of human’s sexual differences. It is widely known that Indonesians are a patriarchal society which as a structure which derogates women. This happens both from the governmental policies and in the people’s behavior.

4. The Protection for Women and Children Trafficking Victims from the Health Perspective:
The trafficking victims generally face both physical and mental torture. Thus, they need special treatment. To achieve this, there needs to be a cooperation between the legal, psychological, and medical fields. This is so, because the victims experience torture in the shelters, which will influence their mental and physical health condition. The rights which must be obtained by the victims regarding the compensation for the loss they suffered are as follows:

1. Freedom from torture or harassment from the parties in control.
2. Adequate physical and psychological health services, which are confidential and affordable, which are provided by the state or private sectors which are funded by the government.
3. The protection of the victims’ personal identities and information. Their names, addresses, and photos are prohibited from being published to the general public.
4. The victims have the right to obtain information regarding the results of the investigation. The victims and the families have the right to know if the traffickers are freed.
5. The victims have the right to be helped and to be assisted in the whole legal process.

All of these rights must be upheld for the enforcement of justice and welfare for the people. The rights obtained by the victims must also specially be handled by institutions which treat victims of women and children trafficking. As commonly known, the rights of the victims of these cases have not yet been maximally obtained by the victims. Most victims are only brought home. Worse, even if the case is handled by the law-enforcing apparatus, it is not completely uncovered.

Conclusion

Based on the explanation above, it can be concluded that the form of women and children trafficking which happen in Jember Regency is prostitution. The eradication of the women and children trafficking regards the protection towards the trafficking victims who experience both physical and mental sufferings. There needs to be a special treatment for the victims, thus, there needs to be a cooperation between the aspects of law, especially the three things which regard the law enforcement, like the constitution, the law-enforcing apparatus, and the society (culture). There also needs to be a cooperation with the fields of psychology and medicine.
Conflict of Interest: No

Source of Funding: Author

Ethical Clearance: Yes

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Determinant Factors of Interprofessional Collaboration in Labuang Baji General Hospital

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Abstract

Background: Health services provided to the community were often overlapped among health care professionals. Poor communication may affect the quality of patient care and potentially increase the number of medical errors.

Objective: The study aims to analyze the most determinant factors associated with the implementation of Interprofessional Collaboration (IPC) at Labuang Baji General Hospital.

Method: The study used a cross-sectional design for data collection method. A questionnaire was administered to 291 respondents. The data analysis was performed using a computer program and statistical analysis, namely Univariate analysis distribution (of frequency) and logistic regression.

Results: The results reveal that the determinant factors affecting the implementation of IPC are Communication (P = 0.000), Trust and Respect (P = 0.017), Administrative Support (P = 0.000), Culture (P = 0.000), Law and Regulations (P = 0.001), and Finance (P = 0.000).

Conclusion: An effective communication with other healthcare teams in the implementation of IPC leads to effective and safe healthcare services at Labuang Baji General Hospital, Makassar. Based on this reason, a policy is needed to improve the implementation of IPC in Labuang Baji General Hospital.

Keywords: health care services, Interpersonal Collaboration, individual competence.

Introduction

An efficient Interprofessional Collaboration (IPC) provides holistic services to patients in increasing the quality of healthcare and patient satisfaction as well as cost-efficient healthcare. Morley and Cashell¹ state that nurses-physician relationships improve patient care quality. WHO² and Schadewaldt et al. argue that IPC improves the quality of patient care, shortens hospital stays, reduces healthcare costs, and reduces health worker’s workloads and stress²-³. Besides, a study conducted by Hughes and Fitzpatrick and Gausvik et al demonstrates that IPC leads to a reduction of mortality, increased job satisfaction, and a reduction of healthcare costs 4, 5.

WHO describes the importance of IPC in decreasing total patient complications, length of hospital stay, tension and conflict among caregivers, mortality rates, cost of care, duration of treatment, and increasing patient and career satisfaction². Meanwhile, communication is an essential thing in implementing IPC to provide health services to patients and the community. Caring without effective communication leads to guesswork and is based on stereotypes⁶. Communication in IPC is also a substantial effort to improve the quality of caring and patient safety⁷,⁸.
Materials and Method

Location and Design: The researcher conducted this study at Labuang Baji General Hospital, Makassar. This study was non-experimental research with quantitative approaches, descriptive statistics and correlation, and cross-sectional study design. Population and Sample: The population in this study were all healthcare providers who provide health services to patients in the Labuang Baji Hospital treatment rooms, Makassar. The sample was 291 health workers consisting of doctors, nurses, pharmacies, and nutritionists. The sampling was performed employing proportional stratified random sampling.

Data Collection: The primary data were sparse through questionnaires and observations. The secondary data was obtained from relevant parties such as Labuang Baji General Hospital, Makassar. Data Analysis and Presentation: Data were analyzed by using computer programs and statistical tests of Univariate analysis distribution (of frequency) and logistic regression

Results

Table 1. Respondent Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;35</td>
<td>124</td>
<td>43</td>
</tr>
<tr>
<td>&gt;= 35</td>
<td>167</td>
<td>57</td>
</tr>
<tr>
<td>Gender</td>
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<td></td>
</tr>
<tr>
<td>Male</td>
<td>89</td>
<td>31</td>
</tr>
<tr>
<td>Female</td>
<td>202</td>
<td>69</td>
</tr>
<tr>
<td>Level of Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor/Master</td>
<td>232</td>
<td>80</td>
</tr>
<tr>
<td>Diploma III (three) of Health Education</td>
<td>59</td>
<td>20</td>
</tr>
<tr>
<td>Length of Work Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5</td>
<td>178</td>
<td>61</td>
</tr>
<tr>
<td>&gt; 5</td>
<td>113</td>
<td>39</td>
</tr>
<tr>
<td>Total</td>
<td>291</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1 depicts the most respondents aged more than 35 years old (57%), 202 respondents (69%) were female, the highest level of education was bachelor/master by 232 respondents (80%), and 61% of respondents had work experiences less than five years.

<table>
<thead>
<tr>
<th>Determinant Factors</th>
<th>P</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>0.000</td>
<td>There is a relationship</td>
</tr>
<tr>
<td>Motivation</td>
<td>0.174</td>
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</tr>
<tr>
<td>Trust and Respect</td>
<td>0.017</td>
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</tr>
<tr>
<td>Structure</td>
<td>0.052</td>
<td>No relationship</td>
</tr>
<tr>
<td>Composition</td>
<td>0.315</td>
<td>No relationship</td>
</tr>
<tr>
<td>Shared Vision</td>
<td>0.214</td>
<td>No relationship</td>
</tr>
<tr>
<td>Leadership</td>
<td>0.025</td>
<td>There is a relationship</td>
</tr>
<tr>
<td>Administrative Support</td>
<td>0.000</td>
<td>There is a relationship</td>
</tr>
<tr>
<td>Education</td>
<td>0.560</td>
<td>No relationship</td>
</tr>
<tr>
<td>Culture</td>
<td>0.000</td>
<td>There is a relationship</td>
</tr>
<tr>
<td>Law and Regulations</td>
<td>0.001</td>
<td>There is a relationship</td>
</tr>
<tr>
<td>Finance</td>
<td>0.000</td>
<td>There is a relationship</td>
</tr>
<tr>
<td>Technology</td>
<td>0.450</td>
<td>No relationship</td>
</tr>
</tbody>
</table>

Table 2 describes that the determinants factors associated with the implementation of IPC are Competencies with P-value 0.000, Trust and Respect with P-value 0.017, Administrative Support with P-value 0.000, Culture with P-value 0.000, Law and Regulations with P-value of 0.001, and Finance with P-value 0.000.

Discussion

Interprofessional collaboration is when health professionals from various professions work together to provide patient-centered care. Poor communication can be the main root cause of service errors in patients. In order for collaboration between professionals to be carried out all health professionals need to know the contribution made by each profession; maintain mutual respect for each other’s expertise; communicate effectively and look for continuing education training opportunities to enhance collaboration between professionals.

The effective communication relationships for interprofessional teamwork results in positive outcomes for effective and safe healthcare services. This is consistent with the theory that communication supports high-quality, safe, effective and efficient interprofessional care in a complex health care system. Various attempts were made as an effort to improve IPC, among other things, by implementing an integrated patient record system. IPC can optimize patient safety.
Likewise, the efforts made by Labuang Baji General Hospital, among others, by initiating training for health workers for IPC.

Nurses and other healthcare teams are required to build an effective communication and leadership skills to work productively within interprofessional teams, establish open communication, use mutually respectful communication, and assist in decision making to promote quality patient care. One of the core competencies for interprofessional collaborative practice is effective communication. All health workers must be able to communicate effectively with other healthcare teams to integrate safe and effective care for patients and other health workers.

IPC within professional work environments has been recognized by nursing staff, other healthcare teams and health care professional associations as an essential determinant in improving patient safety with high quality and providing patient-centered care. In its implementation there will be a general challenge that can be found, namely the cultural complexity of the arrangements which are socio-cultural aspects of each health profession.

Collaboration among health professionals and effective interprofessional collaborative practices are the theme developed in hospitals for healthcare settings. Collaboration between healthcare professionals providing services to patients is an effective way to stabilize care, reduce the excessive use of the health care system, increase the delivery of health services, and reduce the cost of care. Interprofessional teamwork is a very effective factor that can contribute to positive interprofessional collaboration practices.

Conclusion

Based on the findings, determinant factors of the implementation of IPC are Communication (P= 0.000), Trust and Respect (P= 0.017), Administrative Support (P= 0.000), Culture (P= 0.000), Law and Regulations (P= 0.001), and Finance (P= 0.000).

Implication: IPC is an effective and efficient strategy to improve healthcare quality and patient health outcomes at Labuang Baji General Hospital, Makassar. IPC should, therefore, be continuously improved and developed. Further studies exploring challenges that become obstacles of physicians-nurses IPC with more accurate research instruments are needed.

Ethical Clearance: Taken from Faculty of Public Health, Universitas Hasanuddin ethical committee

Source of Funding: Self

Conflict of Interest: Nil

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The Effect of Reproductive Health Gymnastics on Hemoglobin Levels of Female Adolescents

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Abstract

Female adolescents who have experienced menstruation are at high risk of anemia, especially iron nutritional anemia. Efforts made by the Government in overcoming anemia in adolescent girls are by providing Blood Plus Tablets, but based on data from the Ministry of Health in 2017, the percentage of Fe (iron) tablets obtained by adolescent girls is still very low, namely 13.8%, so it is not yet fulfilling. the national target is 30%, so there needs to be another strategy to overcome anemia in adolescent girls. Reproductive health exercise is one of the physical activities that can be an alternative for adolescent girls who experience anemia because it can increase hemoglobin production. This study analyzed the hemoglobin levels of adolescent girls after being given reproductive health exercises. The results showed that Kespro exercise had an effect on hemoglobin levels in adolescent girls with a p value <α (0.05) where the hemoglobin level before being given treatment in the intervention group was the average hemoglobin level of 10.1 gr/dL and the hemoglobin level after treatment. That is, the average hemoglobin level is 13 gr/dL. The hemoglobin level before being given the treatment in the control group was an average hemoglobin level of 9.8 gr/dL and the hemoglobin level after being given the treatment was an average hemoglobin level of 12.2 g/dL.

Keywords: Female Adolescents, Hemoglobin Levels, Anemia, Reproductive Health Gymnastics.

Introduction

Adolescence is a period of change that occurs during childhood into adulthood which is marked by changes in growth and development. One of the developments that occur during adolescence is that it begins with the maturation of reproductive organs such as menstruation in young women. Menstruation or menstruation is periodic bleeding through the vagina with endometrial discharge that occurs for 3-7 days with blood output of about 50-150 milliliters1.

Physiologically, girls who experience menstruation will bleed every month. Excessive bleeding and irregular menstrual cycles can affect the condition of young women2. Teenage girls who have experienced menstruation are at high risk of anemia, especially iron nutritional anemia.

Anemia is a hemoglobin (Hb) level or the number of red blood cells that is less than normal (12.0 gram/100ml). Signs and symptoms of adolescents who have anemia such as pale, weak, tired, dizzy, which causes the ability to concentrate on learning to decline, inhibits physical growth and development of brain intelligence, and decreases in immune system due to increased infectious diseases3-8.

Based on data from the WHO (World Health Organization) in the SEARO (South East Asian Region Office) in 20149, young women suffering from mild to severe anemia in Southeast Asia range from 25-40%, while in developing countries women suffer from substance deficiency anemia as much as 370 million with 41% of non-pregnant women and girls in India the prevalence of anemia reaches 45%. In addition, the prevalence of anemia in Indonesia is still quite high. Based on the results of the 2018 Riskesdas data, the...
prevalence of anemia that occurs in women is 27.2% with the proportion aged 15-24 years of 32%^10.

Efforts made by the government in overcoming anemia in adolescent girls are by providing Blood Plus Tablets in schools such as Junior High Schools (SMP) and Senior High Schools (SMA) or the equivalent given the dosage of 1 tablet/week and 1 tablet/day during menstruation^11. Based on data from the Ministry of Health in 2017, the percentage of Fe (iron) tablets obtained by adolescent girls is still very low, namely 13.8%, so that it has not met the national target of 30%, for this we need another strategy to overcome anemia in adolescents.11-14

One of the strategies that can be done to overcome the problem of anemia is by providing therapy in the form of physical activity. Doing physical activity can increase blood volume caused by cardiovascular changes (Nurafandi, 2017). Individuals who exercise regularly will experience a slight increase in hemoglobin, this is because cells or tissues need more O2 (oxygen) when doing activities 15-17.

Increased oxygen consumption during physical activity allows hemoglobin which carries protein in erythrocytes to reach cells. An important function of hemoglobin is as a medium for transporting oxygen from the lungs (respiratory organs) throughout the body. Physical activity is an activity that can improve health status if it is done regularly, routinely and repeatedly. Physical activity that is in great demand by young women is gymnastics18,19. One of the exercises that teenagers can do to increase their hb level is by doing reproductive health exercises. Reproductive health exercise is a physical exercise adopted from aerobics and SKJ (Physical Fitness Exercises) in 2012 which requires sufficient oxygen to get a source of energy (Sarah et al., 2019). Based on research conducted by Sarah in the intervention group which was carried out for 4 weeks by being given Fe tablets and reproductive health exercises with a duration of 15-20 minutes 3 times a week. There was an increase in hemoglobin levels from an average of 10.43 gr/dL to 13.98 gr/dL, thus the effect of reproductive health exercise on adolescent hemoglobin levels at SMP 26 Semarang in 2019

Materials and Method

This research is a type of experimental Quasy research with a pre-post test control group design. This research was conducted in the Work Area of the Sowi Manokwari Health Center, Indonesia. This study used 2 groups where the control group was given reproductive health exercise without intervention and the intervention group was given reproductive health exercise.

The population in this study were girls aged 13-15 years in the work area of the Sowi Manokwari Health Center in 2020. The sample of this study was anemic girls aged 13-15 years who met the inclusion criteria. The sampling method in this study is nonprobability sampling with purposive sampling technique, namely sampling with the determination of researchers based on inclusion criteria. The number of samples in this study were 20 people.

Reproductive health exercise that is implemented is a development of reproductive health exercise products that have been validated by experts through small-scale validity and reliability tests, product testing and product revisions after small-scale trials to produce products. The product for the development of reproductive health exercise was carried out by Sarah in 2019. The reproductive health exercise movement will be observed using a reproductive health exercise guide.

In this study, data sources were obtained from secondary and primary data. Secondary data were used for a preliminary study to determine the prevalence of anemia in junior high schools in Manokwari Regency. Primary data is by collecting data directly to respondents. The research flow, namely: carrying out the research permit procedure, the research will be assisted by the enumerator, namely by selecting the enumerator. Prepare research instruments and equipment needs for research.

Young women who have agreed to be sampled need to fill out an informed consent form. In examining hemoglobin levels with the cyanmethemoglobin method by taking 20 ul capillary blood to find anemic adolescent girls who meet the inclusion and exclusion criteria that have been determined previously. After finding the young women who had mild dysmenorrhea and anemia who met the criteria to be sampled. Provide an explanation of the objectives, benefits, risks and research procedures to anemic adolescent girls.

Researchers provide education about anemia in young women and alternative treatments by doing reproductive health exercises. Hemoglobin levels were checked before intervention, during menstruation and after intervention with the cyanmethemoglobin method.
The intervention group was female adolescents with anemia aged 13-15 who received reproductive health exercises, where the first week of menstruation was carried out 5 times a week and in the following week after menstruation was carried out 3 times a week with a duration of 15-20 minutes and administration of Fe 60 tablets mg as much as 30 tablets.

The control group was anemic adolescent girls aged 13-15 years who only received 30 tablets of Fe 60 mg for 4 weeks. After being given the intervention for 4 weeks, a re-assessment will be carried out by taking 20 ul of blood for the hemoglobin level which will be checked by the cyanmethemoglobin method using a photometer. Assessment of planned hemoglobin levels will be carried out by the researcher himself and assisted by the enumerator. After each treatment got the final result of the measurement, the researchers made a comparison, namely which intervention group experienced changes in hemoglobin levels. Furthermore, data processing and analysis are carried out.

### Results and Analysis

The results of the univariate data analysis illustrate the mean and standard deviation of the research variables, while the bivariate test analysis was carried out to analyze the effect of reproductive health exercise on hemoglobin levels using a parametric test. Bivariate and correlation tests were carried out if the data were normally distributed and homogeneous with values (p value> 0.05).

**a. Univariate Analysis:** The data normality test used the Shapiro Wilk method because the sample size was less than 50 respondents, in this study the number of respondents was 20 people or 10 people in each group. The data is said to be normally distributed if the p-value is> 0.05.

1. **Test for normality of hemoglobin levels:** The results of the normality test of hemoglobin levels before the intervention, during menstruation and after the intervention were given reproductive health exercise and Fe tablets in the intervention and control groups can be shown in Table 1.

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>n</th>
<th>Statistic</th>
<th>Sig.</th>
</tr>
</thead>
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<tr>
<td>1</td>
<td>Group Intervention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre gymnastics</td>
<td>10</td>
<td>0,96</td>
<td>0,82</td>
</tr>
<tr>
<td></td>
<td>During menstruation</td>
<td></td>
<td>0,96</td>
<td>0,86</td>
</tr>
<tr>
<td></td>
<td>Post gymnastics</td>
<td></td>
<td>0,95</td>
<td>0,72</td>
</tr>
<tr>
<td>2</td>
<td>Group Control</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>Pre administration of iron tablets</td>
<td>10</td>
<td>0,87</td>
<td>0,1</td>
</tr>
<tr>
<td></td>
<td>During menstruation</td>
<td></td>
<td>0,86</td>
<td>0,07</td>
</tr>
<tr>
<td></td>
<td>Post administration of iron tablets</td>
<td></td>
<td>0,94</td>
<td>0,62</td>
</tr>
</tbody>
</table>

Shapiro Wilk: Significant > 0.05

Table 1 shows that all significant values are> 0.05, which means that the data of hemoglobin levels before and after treatment and hemoglobin levels before and after menstruation in the intervention and control groups were normally distributed.

2. **Homogeneity test:** The results of the homogeneity test of hemoglobin levels before the intervention, during menstruation and after the intervention were given reproductive health exercise and Fe tablets in the intervention group can be shown in Table 2.

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>n</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hemoglobin Levels</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre gymnastics</td>
<td>10</td>
<td>0,05</td>
</tr>
<tr>
<td></td>
<td>During menstruation</td>
<td>10</td>
<td>0,73</td>
</tr>
<tr>
<td></td>
<td>Post gymnastics</td>
<td></td>
<td>0,014</td>
</tr>
</tbody>
</table>

Test Homogeneity of Variances : significant>0.05

Table 2 shows that the significant value of hemoglobin levels in the intervention group before treatment is 0.05 and when menstruation is 0.73, which
means that the data is homogeneous, while the significant value after treatment is 0.014 which means that it is not homogeneous because it is smaller than the value 0.05.

b. Bivariate Analysis:

1. Differences in hemoglobin levels before and during menstruation in the intervention group and the control group: The difference in hemoglobin levels before and during menstruation in the intervention group (giving reproductive health exercises and Fe tablets) and the control group (giving Fe tablets) can be shown in table 3.

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>Intervention</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>Difference Mean</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Group Intervenion</td>
<td>Pre gymnastics</td>
<td>10</td>
<td>10,1</td>
<td>0,75</td>
<td>1,7</td>
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<td></td>
<td></td>
<td>During menstruation</td>
<td></td>
<td>8,4</td>
<td>0,71</td>
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<td>Group Control</td>
<td>Pre administration of iron tablets</td>
<td>10</td>
<td>9,8</td>
<td>0,41</td>
<td>1,3</td>
<td>0,000</td>
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<tr>
<td></td>
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<td>During menstruation</td>
<td></td>
<td>8,5</td>
<td>0,56</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P value: significant<0.05

Table 3 shows the results that in the intervention group the hemoglobin level before exercise was 10.1 gr/dL and during menstruation was 8.4 gr/dL decreased by 1.7 gr/dL, while in the control group the average before treatment was 9.8 g/dL and when menstruation was 8.5 g/dL and decreased by 1.3 g/dL with a p-value of 0.000, which means that there were differences in hemoglobin levels in the intervention and control groups before and after menstruation.

2. Differences in hemoglobin levels before and after treatment in the intervention and control groups: The difference in hemoglobin levels before and after treatment in the intervention group (giving reproductive health exercises and Fe tablets) and the control group (giving Fe tablets) can be shown in table 4.

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>Intervention</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>Difference Mean</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Group Intervenion</td>
<td>Pre</td>
<td>10</td>
<td>10,1</td>
<td>0,75</td>
<td>2,9</td>
<td>0,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td></td>
<td>13</td>
<td>0,67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Group Control</td>
<td>Pre</td>
<td>10</td>
<td>9,8</td>
<td>0,41</td>
<td>2,4</td>
<td>0,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post</td>
<td></td>
<td>12,2</td>
<td>0,24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P value: significant<0.05

Table 4 shows the results that in the intervention group the hemoglobin level before treatment was 10.1 gr/dL and after treatment 13 g/dL there was an increase of 2.9 g/dL, while in the control group the average before treatment was 9.8 gr/dL and after treatment 12.2 g/dL and an increase of 2.4 g/dL with a p-value of 0.000, which means that there were differences in hemoglobin levels in the intervention and control groups before and after treatment.

3. Differences in hemoglobin levels before treatment between the intervention and control groups: The difference in hemoglobin levels before treatment in the intervention group (giving reproductive health exercise and Fe tablets) and the control group (giving Fe tablets) can be shown in table 5.
Table 5 Differences in pre-treatment hemoglobin levels between the intervention and control groups.

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Difference Mean</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Group Intervention</td>
<td>10,1</td>
<td>0,75</td>
<td>0,3</td>
<td>0,05</td>
</tr>
<tr>
<td>2</td>
<td>Group Control</td>
<td>9,8</td>
<td>0,41</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P value: significant<0.05

Table 5 shows the results that the average hemoglobin level before being given treatment in the intervention group was 10.1 gr/dL and in the control group an average of 9.8 g/dL with an average difference of 0.3 gr/dL and p-value. value = 0.05, which means that there is a difference in the mean Hb of blood between the intervention group and the control group.

4. Differences in menstrual hemoglobin levels between the intervention and control groups: Differences in hemoglobin levels during menstruation in the intervention group (giving reproductive health exercises and Fe tablets) and the control group (giving Fe tablets) can be shown in table 6.

Table 6 Differences in menstrual hemoglobin levels between the intervention and control groups

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Difference Mean</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Group Intervention</td>
<td>8,4</td>
<td>0,71</td>
<td>-0,1</td>
<td>0,73</td>
</tr>
<tr>
<td>2</td>
<td>Group Control</td>
<td>8,5</td>
<td>0,56</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P value: significant < 0.05

Table 6 shows the results that the average hemoglobin level during menstruation was given treatment in the intervention group 8.4 g/dL and in the control group an average of 8.5 g/dL with a mean difference of -0.1 gr/dL and p-value. value 0.73 means that there is no difference in the mean hemoglobin levels during menstruation between the intervention and control groups.

5. Differences in hemoglobin levels after treatment between intervention and control groups: The differences in hemoglobin levels after treatment in the intervention group (presenting health sessions and Fe tablets) and groups (presenting Fe tablets) can be shown in table 7.

Table 7 Differences in hemoglobin levels after treatment between intervention and control groups

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Difference Mean</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Group Intervention</td>
<td>13</td>
<td>0,67</td>
<td>0,8</td>
<td>0,014</td>
</tr>
<tr>
<td>2</td>
<td>Group Control</td>
<td>12,2</td>
<td>0,24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P value: significant<0.05

Table 7 shows the results that the average hemoglobin level after being given treatment in the intervention group was 13 g/dL and in the control group an average of 12.2 g/dL with an average difference of 0.8 gr/dL and a p-value of 0.014., meaning that there is a difference in mean hemoglobin levels between the intervention and control groups.

Discussion

This study was conducted on 20 anemia adolescents who were divided into 2 groups, 10 anemia adolescents in the intervention group who were given reproductive health exercise with Fe tablets and 10 anemia adolescents in the control group who were given Fe tablets alone for 4 weeks to see their hemoglobin levels. In the intervention
and control groups, hemoglobin levels were checked before being given reproductive health exercise and Fe tablets for the intervention group and Fe tablets for the control group for 4 weeks. After 4 weeks of treatment, re-examination was carried out in the intervention and control groups.

Based on the results of the t-test dependent statistical test, it shows that there is a difference between the hemoglobin levels before and after treatment in the intervention and control groups. After being given treatment to the intervention group (giving reproductive health exercises and Fe tablets), the respondents experienced an average increase in hemoglobin levels by 2.9 g/dL and the control group (giving Fe tablets) the respondents experienced an average increase in hemoglobin levels by 2.4 g/dL. The difference in the change in the mean difference in hemoglobin levels between the intervention and control groups which has a p-value of 0.000 means that there are differences in the mean difference in hemoglobin levels in the intervention group and the control group.

This research is in line with the results of research conducted by Sarah et al., (2019) concerning the effect of reproductive health exercise on adolescent hemoglobin levels at SMP 26 Semarang in 2019 which were divided into 2 groups, namely the intervention group and the control group. Results in the intervention group that was carried out for 4 weeks with iron tablets and reproductive health exercises with a duration of 15-20 minutes for 3 times a week. There was an increase in hemoglobin levels from an average of 10.43 gr/dL to 13.98 gr/dL, thus the effect of reproductive health exercise on adolescent hemoglobin levels at SMP 26 Semarang in 2019.

In addition to reproductive health training, this is in line with research conducted by Setyaningrum et al., namely aerobic exercise in the morning and evening to increase blood hemoglobin levels at SMK Muhammadiyah and SMP Kradenan Blora. Based on the results of research that did aerobic exercise in the morning before being given treatment, the hemoglobin level was 11.90 gr% (early adolescents) then increased to 13.2 gr% and 12.20 gr% (late adolescents) increased to 12.70 gr%. Exercises carried out at night before being given treatment had a hemoglobin level of 12.20 gr% (early adolescents) increased to 13.60 gr% and 12.30 gr% (late adolescents) increased to 13.10 gr%, it can be concluded that there was a difference in hemoglobin levels before and after giving gymnastics to adolescents.

According to Kumalasari, teenage girls who have experienced menstruation are at high risk of anemia, especially iron nutritional anemia, this is because young women bleed every month and consume less iron intake which causes an increase in iron expenditure so that iron levels in the blood decrease and can trigger anemia. During menstruation, women lose ≤ 1.0 mg or lose 28 mg. The iron that women need when they are not menstruating is 1000 calories of food containing 6 grams of iron, while during menstruation women need iron consumption of 18mg/day. Efforts that can be made to overcome anemia in adolescent girls are by giving Blood Supplement Tablets with a given dose of 1 tablet/week and 1 tablet/day during menstruation (KEMENKES). Blood added tablets are iron tablets that contain 200 mg of ferrous sulfate or 60 mg of elemental iron and 0.25 mg of folic acid in each tablet.

Apart from giving blood supplement tablets to adolescents. According to Nurafandi, one strategy that can be done to overcome the problem of anemia in adolescents is by providing therapy in the form of physical activity. Doing physical activity can increase blood volume caused by cardiovascular changes. Individuals who exercise regularly will experience a slight increase in hemoglobin, this is because cells or tissues need more O2 (oxygen) when doing activities.

Increased oxygen consumption during physical activity allows hemoglobin which carries protein in erythrocytes to reach cells. An important function of hemoglobin is as a medium for transporting oxygen from the lungs (respiratory organs) throughout the body. Physical activity is an activity that can improve health status if it is done regularly, routinely and repeatedly. Physical activity that is in great demand by young women is gymnastics.

Reproductive health exercises that are carried out regularly can stretch muscles so that an increase in metabolic activity increases blood circulation and activates the parasympathetic nerves which causes blood vasodilation, resulting in large oxygen concentrations, in the presence of large oxygen in the body, changes in intramuscular osmotic pressure can occur which encourages vascular compartment to the interstitial space which causes plasma volume to decrease so that red blood cells recompile and increase the transfer of iron from the bone marrow to red blood. So that these cells produce an increase in hemoglobin production.
Conclusion and Recommendation

Based on the results of the research and the discussion that has been described, the conclusions in this study are that reproductive health exercise affects the hemoglobin levels of adolescent girls. Provision of reproductive health exercise can increase hemoglobin levels for adolescents who have anemia and can be an effort to overcome anemia in addition to giving blood added tablets, physical activity for reproductive health exercises can be used as an alternative in the treatment of anemia in adolescent girls, because exercise is one of them. Physical activity that many adolescents like.

Ethical Clearance: Taken from Poltekkes Kemenkes Sorong Ethical committee.

Source of Funding: Poltekkes Kemenkes Sorong

Conflict of Interest: Nil.

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https://doi.org/10.1016/j.scispo.2018.04.012
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The Effect of Information Education Using Pocket Book To Knowledge Increase on Leprosy at Malanu Public Health Center Working Area Sorong City

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¹Lecturers Poltekkes Kemenkes Sorong, Indonesia, ²Professor of Environmental Health Department, Faculty of Public Health, Hasanuddin University, Makassar

Abstract

Leprosy (Morbus Hansen) is a chronic infection disease caused by Mycobacterium leprae that firstly attack peripheral nervous then the skin, mucosamembrane, upper respiratory track, eyes and others body tissue except central nervous system. The province of West Papua have the largest number of leprosy in Indonesia. This number is shocking and make people worried. Data from public health office of West Papua province discovered as much as 607 cases of leprosy was found in West Papua distributed in many areas. From that data, West Papua province in 2015 was selected as endemic categories. The purpose of this research was to know the affect of information education using pocket book and audio visual to knowledge increase on leprosy and prevention behavior on leprosy patient at Malanu public health center working area sorong city.

Research design used was “Quasi experimental pre-post test design” with audio visual and pocket book intervention. This design used to learnt about “caused-effect correlation” framework phenomenon with giving intervention or manipulation on research subject, and then learn the effect of the intervention. Population in this research was all patient with leprosy at Malanu Public Health Center working area. Total sample in this research was 20 people for each group using purposive sampling technique, purposive sampling technique is a choosing a group of subject based on certain characteristic that has a strong bond with population characteristic that have been known before. The affect analysis of information education to knowledge increase on leprosy after intervention was meaningfully increase than before intervention as much as 0,000 (p value <0.05). Conclusion, there was a significance affect to respondent’s knowledge increase after intervention.

Keywords: Leprosy, Pocket Book Information Education, Knowledge.

Introduction

Leprosy (Morbus Hansen) is a chronic infection disease caused by Mycobacterium leprae that first attack peripheral nervous, then skin, mucosamembrane, upper respiratory track, eyes and others body tissue except central nervous system. Data from World Health Organization (WHO)¹ showed 224.717 of leprosy cases and 259.017 cases in 2015. In 2013, Indonesia was the third in the world after India and Brazil, with 16.856 new leprosy case and the amount of grade two disability among new case was 9.86 ²

The province of west papua have the largest number of leprosy case in Indonesia. The number was large enough to makes people worried. Data from west papuaprovince, showed that 607 cases found in many areas in west papua. From that data, in 2015 west papua was selected as high endemic categories. Based on preface survey on June 11 2018 at Sorong Public Health Office obtained as much as 122 cases found in the last quarter, and leprosy case in Malanu Public Health Center in 2018 was 20.
Leprosy is a chronic infection disease caused by Mycobacterium leprous (M lepra) that its intracellular obligate attack peripheral nervous system first, then skin, mucosa membrane, upper respiratory track and other organs except central nervous system. Leprosy caused by M leprous that found by G.H Armauer Hansen in 1873 in Norwegia. This basil is acid resistant, pleomorflurus shape, slim stick and the rest has paralel shape with both ends, round with 1-8 um length and 0,25-0,3 um diameter.

Epidemiologi: The infection source is patient with so many multibasiler (MB) basil type. How its infected people is still unsure yet, just based on classic opinion that stated long and tight direct contact between skin. Other opinion stated trough inhalation,because M leprosystill could live for days in droplet.

Patophysiology: The exact leprosy infection mechanism is still unsure yet. Some hypothesis stated such as skin contact and airborne. Proved that not all people infected by M. Leprous experienced leprosy. Weather, diet, nutrition status, social economy status and genetic also play a role found after some research and observation was done on leprosy group on certain family.

Materials and Method

Design: This research using “Quasi experimental pre-post test design” with audio visual and pocket book intervention. This design can be use to learn the phenomenon on framework of “cause-effect correlation” with giving intervention or manipulated on research subject, then learn about its intervention effect.

Population: Population is all individual who become the references of research result that have certain characteristic. Population in this research is all patient with leprosy on Malanu Public Health Center working area.

Sample: Sample is a part of population that chosen with certain way to represent the population also sample is a part or vice from target population. Sample used in this research contain with so many benefits, such as cheaper, easier, faster, specific and representing the population.

The amount of sample use in this research is 20 respondent for each group, using purposive sampling as the sample technique, a technique that choose a group of subject based on certain characteristic that considered having strong relation with population characteristic that have been known before.

Location: The research was done with home visited method to the family with leprosy member on Malanu Public Health Center working area.

Data Analysis:

Univariat: Univariat analysis done to describe every variable that measure on the research. Respondent characteristic including age, gender, education level and job are categorical data analyzed for measuring frequency and variable percentage.

Bivariat: Bivariat analysis done to prove the research hypothesis, is to see the affect of information education using audio visual and pocket book to knowledge increase about prevention of leprosy disability before and after intervention at Malanu Public Health Center working area using Mann Whitney T-Test.

Results

Univariat Analysis:

Table 1. Respondent distribution based on gender at Malanu Public Health Center working area.

<table>
<thead>
<tr>
<th>No.</th>
<th>Gender</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Male</td>
<td>12</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>Female</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2. Respondent distribution based on age at Malanu Public Health Center working area.

<table>
<thead>
<tr>
<th>No.</th>
<th>Age</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15-40</td>
<td>15</td>
<td>75</td>
</tr>
<tr>
<td>2</td>
<td>41-60</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>&gt;61</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3. Respondent distribution based on education level at Malanu Public Health Center working area.

<table>
<thead>
<tr>
<th>No.</th>
<th>Education Level</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Elementary school</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Junior high school</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Senior high school</td>
<td>11</td>
<td>55</td>
</tr>
<tr>
<td>4</td>
<td>University</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 4. Respondent distribution based on occupation at Malanu Public Health Center working area.

<table>
<thead>
<tr>
<th>No.</th>
<th>Occupation</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Farmer</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Civil</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>House wife</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>Private</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>Unemployee</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>6</td>
<td>Student</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 5. Respondent distribution based on leprosy period length at Malanu Public Health Center working area.

<table>
<thead>
<tr>
<th>No.</th>
<th>Period</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 year</td>
<td>7</td>
<td>35</td>
</tr>
<tr>
<td>2</td>
<td>2-5 year</td>
<td>13</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

Respondent distribution based on gender, age, education level, occupation and leprosy period length. Analysis result table 4.1 from 20 respondent, most of them is male as much as 12 (60%), the most or 15 respondent age are between 15 to 40 years old (75%), as much as 11 respondent education level are senior high school (55%), 8 respondent are unemployed (40%) and leprosy period length is between 1-5 years foe 13 respondent (65%).

Bivariate Analysis: Result from Kolmogorov–Smirnov showed data distribution abnormally, then Wilcoxon Match Pairs Test was used.

<table>
<thead>
<tr>
<th>Postespeng-pretespeng</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Ranks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>14a</td>
<td>7.50</td>
<td>105.00</td>
</tr>
<tr>
<td>Ties</td>
<td>0b</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Total</td>
<td>6c</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Test Statistic:

<table>
<thead>
<tr>
<th>Postespeng-pretespeng</th>
<th>Test Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>-3.557a</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.000</td>
</tr>
</tbody>
</table>

Analysis of the affect of information education to knowledge increase on disability leprosy prevention after intervention increase significantly and meaningfully than before intervention was given with p value 0.000 (p value < 0.05).

Discussion

This research purpose is to describe the affect of information education using pocket book and audio visual to knowledge increase of disability leprosy prevention. Ability of patient before intervention was mostly under 12 respondent from all (60%). This mean education and knowledge about leprosy is still below. This research was in line with research about the correlation of knowledge and infection prevention behavior of leprosy at TanjungAnom Public Health Center stated that knowledge is result from know and this happen after somebody using their senses on certain subject.

Respondent ability after intervention, increase into good rank as much as 10 respondent (50%). This mean there is showed an effect to their knowledge after intervention was given. Antari also stated the similar thing in her research that there is a significance correlation between knowledge and leprosy disability prevention9-16. The affect of education using pocket book and audio visual to behavior increase to leprosy disability prevention. Analysis about respondent behavior on Wilcoxon test resulted with 0,014 (p value <0,005), it means there is no significance affect to respondent behavior and attitude on leprosy disability prevention at Malanu Public Health Center working area.

Different with research done by AgustiNala at all stated that good behavior and attitude, surely will prevent the disability on leprosy which means respondent with bad attitude and behavior are 7 times more risk on disability of leprosy. So that, the higher the respondent knowledge about leprosy, the better their action to prevent disability caused by leprosy. All factor environmental and nutrition potential to affect the health status leprosy patients17-26.

Conclusion

There is a significance affect to respondent knowledge after intervention 2 days in row at Malanu Public Health Center working area.

Suggestion:

For leprosy patient: Expected to increase their knowledge with actively seeking for information as much as possible about leprosy and how its spreading.
For health staff: Giving information about leprosy as optimal as possible, in hope to increase patient knowledge, as beginning step to prevent the disease and its spreading.

For researcher: For the next researcher, hope this research will help you to find any data or references.

Acknowledgments: The research of the authors was supported by DIPA.

Ethical Clearance: Taken from Poltekkes Kemenkes Sorong Ethical committee.

Source of Funding: Poltekkes Kemenkes Sorong Via DIPA.

Conflict of Interest: Nil.

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Effects of Vitamin E Administration on Menstrual Disorders among Adolescents who have Smoking Family Members

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Abstract
Smoking habit can cause health problems and disease in the community. One of the effects is related to reproductive health and fertility problems among women who are second hand smokers. Vitamin E is a supplement to treat fertility problems. The purpose of this study was to determine the effect of giving Vitamin E to menstrual disorders among adolescents who have smoking family members in Senior High School 2 Sorong Regency. Design of the study was quasi-experimental study using 30 samples who are chosen by purposive sampling techniques. The sample was divided into 2 groups. The experiment group was given vitamin E 100 IU/day for 3 months and the control group was not given anything. The result of the data analysis used Mann Whitney Statistical Test obtained p value 0.031<0.05. Conclusion there is a significant effect of giving vitamin E to menstrual disorders among passive smoker adolescents or those who have smoking family members in Senior High School 2 Sorong Regency. It is highly recommended that vitamin E be given as an antioxidant for both active and passive smokers.

Keywords: Cigarette, vitamin E, menstrual disorders.

Introduction
Adolescence is a period of transition from children to adulthood where adolescents are experiencing physical and psychological changes. The number of teenagers in Indonesia continues to increase annually. In Indonesia according to the Central Bureau of Statistics, the 10-19 years age group is around 22% of the population, consisting of 50.9% of male and 49.1% of female adolescents. Female adolescents are experiencing various changes marked by secondary sex growth such as enlargement of the breasts, growth of pubic hair and menarche.

Smoking causes health problems for the community and cause several diseases such as heart disease, chronic lung disease, infectious diseases, cancer by Bayoumi et al., ¹, and risk factors for asthma, respiratory infections, coughing, sneezing, middle ear infections, and sudden infant death syndrome and can affect reproductive health and fertility in women². Various studies have shown, passive smokers have the same risk as active smokers for coronary heart disease, stroke, emphysema, lung cancer, and chronic lung disease³. Cigarette smoke components that affect the female reproductive system, for example, nicotine, cotinin, the main metabolites of nicotine, carbon monooxides, cadmium, and some mutagenic polycyclic aromatic hydrocarbons⁴-¹⁰

In developing countries, the number of smoking men is higher than smoking women. Smoking men are usually surrounded by children and women including female adolescents. This makes adolescents become passive smokers or second-hand smokers which causes reproductive health issues such as problem during menstrual cycle². Components of cigarettes also cause oxidative stress and DNA damage to follicles in the ovary and affect folliculogenesis by inhibiting follicular growth¹¹,¹². An important component that is able to save human body cells from the danger of free radicals is antioxidants. Alfa-tocopherol or Vitamin E functions as the main antioxidant in the lipid compartment and has
the ability to protect from lipid peroxidation\textsuperscript{13}. Research conducted by Neunteufl\textsuperscript{14} that oral alfa-tocopherol supplementation can reduce transient endothelial function disorders among heavy smokers.

Preliminary study conducted in June 2019 at Senior High School 2 Sorong Regency by the interviews with 69 female adolescents about the existence of smoking family members and consumption of antioxidants. Result shows that 79\% of them have family members who smoke either father, mother or other siblings. Further, those female adolescents also have never consumed any antioxidants or supplements.

\textbf{Material and Method}

The design of the study is a quasi-experimental study using one-shot case study with control group design techniques. The sample in this study was 30 respondents, which were divided into 2 groups, the experiment group consisted of 15 respondents and the control group consisted of 15 respondents. Both groups were interviewed about their menstrual problems. The experiment given to experiment group was administration of vitamin E or alfa-tocopherol for 3 months with dosage 100 IU per day. After 3 months of treatment, interviews were then conducted about menstrual problems experienced during the 3-month of intervention.

\textbf{Results}

1. \textbf{Overview of Research Locations:} This study was carried out at Senior High School 2 Sorong Regency, located on Nangka Malawili Street, Aimas, Sorong Regency. The school had 48 teachers and 682 students consisting of 312 male and 370 female.

2. \textbf{Characteristics of Respondents:} The table below shows the characteristics of respondents by age and Body Mass Index (BMI).

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|}
\hline
Characteristic & Control group & Experimental group & Total & \% \\
\hline
Age (Years old) & & & & \\
16 & 2 & 0 & 2 & 6,7 \\
17 & 11 & 11 & 22 & 73,3 \\
18 & 2 & 4 & 6 & 20 \\
BMI & & & & \\
Thin & 0 & 2 & 2 & 6,7 \\
Normal & 15 & 13 & 28 & 93,3 \\
\hline
\end{tabular}
\caption{Characteristics of Respondents by Age and BMI in SMA Negeri 2 Sorong Regency}
\end{table}

As seen on table 1, it can be seen that the most respondents were 17 years old (73.3\%) and most had normal BMI (93.3\%).

3. \textbf{Effects of Vitamin E Administration on Menstrual Disorders among Passive Smoker Adolescents SMA Negeri 2 Sorong Regency:}

This study was conducted for 3 months with \textbf{stages}: 1) data collection before treatment to identify the presence of family smoking and menstrual disorders, 2) providing intervention by giving 100 IU/day of vitamin E for 90 days (three menstrual cycles) and 3) data collection menstrual disorders for three months. Data can be seen in the following table:

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|}
\hline
Menstrual Disorder & Control group & Experimental group & Total \\
\hline
Dysmenorrhea & 13 & 13 & 26 \\
Prolonged (> 4 days) & 5 & 7 & 12 \\
Too much bleeding (> 4 pads) & 10 & 11 & 21 \\
\hline
\end{tabular}
\caption{Menstrual Disorder among Passive Smoker Adolescents}
\end{table}
Based on table 2, it can be seen that the most respondents experienced menstrual pain or dysmenorrhea disorders with 26 respondents, too much bleeding with 21 respondents and prolonged menstrual period with 12 respondents. This shows that almost all respondents experienced menstrual pain and a few had long periods.

Table 3. Distribution of Menstrual Disorders After Treatment among Adolescents Who Have Family Members Smoking

<table>
<thead>
<tr>
<th>Menstrual Disorder</th>
<th>Control Group</th>
<th>Experiment Group</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f %</td>
<td>f %</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10 66.7</td>
<td>4 26.7</td>
<td>0.031</td>
</tr>
<tr>
<td>No</td>
<td>5 33.3</td>
<td>11 73.3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15 100</td>
<td>15 100</td>
<td></td>
</tr>
</tbody>
</table>

Based on table 3, it shows that after treatment most control groups experienced menstrual disorders (66.7%) than those who did not (33.3%) while in the experiment group, most respondents did not experience most menstrual disorders (73.3%) as compared to those experienced disorders (26.7%). Furthermore, the hypothesis test using the Mann Whitney test obtained p value 0.031<0.05, which means that there is significant effect of giving vitamin E to menstrual disorders in adolescents who have smoking family members in SMA Negeri 2, Sorong Regency. The Vitamin E Administration reduced the occurrence of menstrual disorders.

Discussion

This study shows that the presence of smoking families has an impact on teenage menstrual disorders and most teenagers experience menstrual pain, more than four days of menstrual phase and more than four menstrual pads per day. Exposure to cigarette smoke can be either active or passive, and the type of cigarette smoke that is inhaled has a different origin. Active smokers inhaled smoker directly from the cigarette, while passive smokers will inhale from other people’s tobacco smoke. Various studies have shown that passive smoking has the same risk as active smokers for coronary heart disease, stroke, emphysema, lung cancer, and chronic lung disease.15-17

Cigarette smoke contains a number of ROS that can stimulate cell growth and proliferation, showing physiological functions in normal tissue. An excessive increase in Reactive Oxygen Species (ROS) will cause damage to DNA, lipid membranes, and proteins. Cigarette smoke also contains chemicals including oxidants, free radicals, and carcinogens.18 Research conducted by Khorram, et al.19 who used human endometrial epithelial cell culture reported that cigarette smoke can reduce endometrial proliferation via the nitric oxide pathway. Cigarette smoke has been linked to infertility, abnormal uterine bleeding, increased risk of endometrial cancer in premenopausal women and stimulates the production of nitric oxide in endometrial cells.19

Research conducted on mice given cigarette smoke for 8 weeks resulted in a reduction in the number of primordial follicles and loss of volume from the ovaries. Destruction of primordial follicles in mice is known from three types of PAHs: DMBA, 3-methylcholanthrene (3-MC), and BAP by destroying primordial follicles in laboratory animals and contributing to the onset of menopause in women who smoke.20,21 The results showed there was an effect of vitamin E administration to menstrual disorders (dysmenorrhea, menstrual disruption and the number of menstrual disorders) among adolescents who had family members smoking in SMA Negeri 2 Sorong Regency.

According to Kontush, et al.22 alfa-tocopherol in high concentrations will be a prooxidant which will increase the concentration of plasma and LDL peroxidation if the body is oxidized. The prooxidant effect of alfa-tocopherol on LDL is related to the production of α-tocopheroxyl radicals, can replace other soluble antioxidants, disrupt the balance of the natural antioxidant system and increase susceptibility to oxidative damage.23 This study uses vitamin E at a dose of 100 IU/day.

Prooxidant activity is derived from chain propagation by α-tocopheroxyl radicals (Toc.) which directly oxidize lipids (PUFA) to form lipid radicals (L.). The antioxidant activity of α-tocopherol can be prevented by eliminating α-tocopheroxyl radicals (Toc.) Through direct recycling into α-tocopherol mediated by co-antioxidants such as ascorbic acid (vitamin C) because physiologically vitamin C is present in high concentrations of plasma. Thus, α-tocopherol will always function as an antioxidant if the concentration of co-antioxidants is high enough.22

Furthermore, a study conducted by Chatterjee, et al.24 Vit-E supplementation at a dose of 400 mg per day for 7 days significantly inhibits platelet clumping.
and increases endurance capacity at each stage of the menstrual cycle in female athletes. Wardani in her study showed that vitamin E can increase levels of the hormone estrogen and alveolar bone structure in female mice that do maximum physical exercise.

Another study supporting the this study conducted by Bataille, et al. stated that the combination of pentoxifylline and alfatoropherol can increase pregnancy rates in patients with thin endometrium which is related to the function of the ovaries and endometrial thickness. This is supported by research conducted by Acharya, et al. that the combination of administration of pentoxifylline and tocopherol can increase endometrial thickness in women with thin endometrium undergoing pregnancy therapy.

According to Kelly smoker’s body exposed to cigarette smoke will result in lipid peroxidation so it needs to increase the need for antioxidants such as alfatoopherol to reduce oxidative stress that occurs. The administration of alfatoopherol supplementation to smokers increases alfatoopherol in serum and LDL concentrations by two to three times (dose dependent) and concentrations in lung tissue by 20 percent.

Alfatokoperol as an antioxidant in cell membranes plays a role in preventing lipid peroxidation because it can capture peroxil lipid radicals (scavenging) in cells and cell organelles and the speed of alfatoopherol in capturing free radicals exceeds the speed of radicals themselves in reacting with adjacent fatty acid chains. According to Nagama, et al. Vitamin E is a fat-soluble antioxidant by breaking the chain of oxidative reactions so that it helps to maintain and can protect cell membranes from damage caused by ROS and reactive products from lipid peroxidation as well as to reduce oxidative stress.

This is consistent with research conducted by Armiyanti proved the administration of red fruit oil to endothelial cells exposed to serum with severe malaria and normal neutrophils can inhibit the production of ROI (reactive oxygen intermediates) in endothelial cells thereby reducing oxidative stress. Oxidative stress that occurs due to ROS production by host phagocyte cells and endothelial cells as an immune response to infected erythrocytes and ROS formation through unstable hemoglobin. Red fruit oil is a potential source of antioxidants (α-tocopherol and β-carotene) and the highest antioxidant content is α-tocopherol. α-tocopherol is found in cell membranes and is hydrophobic so that it can inhibit the formation of superoxid radicals and change NADPH (nicotinamide adenine dinucleotide phosphate) oxidase in the membrane by inhibiting the formation of complex NADPH oxidase subunits thereby preventing oxidative stress and apoptosis in endothelial cells.

**Conclusion**

There is an effect of giving vitamin E to menstrual disorders among adolescents who have smoking family members in Senior High School 2 Sorong Regency. The Vitamin E administration reduce the occurrence of menstrual disorder among female adolescents in Senior High School 2 Sorong Regency.

**Ethical Clearance:** Taken from Poltekkes Kemenkes Sorong Ethical committee

**Source of Funding:** Poltekkes Kemenkes Sorong

**Conflict of Interest:** Nil.

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Effect of Use of Aluminum Foil Blanket Against Increased Body Temperature in Patients Hypothermia after Spinal Anesthesia in the Operation Room of the Sele Be Solu Hospital, Sorong West Papua

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Abstract

Local, general, and regional anesthesia is complex actions or events that cannot be separated from elective or emergency surgery. Anesthesia affects the three thermoregulatory elements consisting of afferent input elements, signal regulation in the central region, and also the efferent response which can lead to hypothermia. This study aims to determine the effect of the use of aluminum foil blankets on increasing body temperature in hypothermia patients after spinal anesthesia. This study uses a Pre-Experimental study design with a Pre-Post Test Only Design approach. Sampling in this study used a purposive sampling technique. 12 samples were given the intervention to use aluminum foil blankets. Analysis of data using the Shapiro-Wilk test, Homogeneity of Lavene Test, and Paired sample T-Test. The results of statistical tests using the Paired Sample T-Test obtained a p-value of less than 0.05 (<0.05), namely p = 0.000. There is an influence of the use of aluminum foil blankets to increase body temperature in hypothermia patients after spinal anesthesia.

Keywords: Hypothermia, Aluminum Foil Blanket, Post Spinal Anesthesia.

Introduction

Local, general, and regional anesthesia is complex actions or events that cannot be separated from elective or emergency surgery. Anesthesia affects all three thermoregulation elements consisting of Aferen inputs, signal settings in the central area, and also the efferent response otherwise, it can also eliminate the adaptation process as well as interfere with the mechanism of lipid or skin physiology in thermoregulation function. This resulted in the patient having hypothermia. The Post-operative hypothermia incidence rate can be said quite highly. The year 2015 at the Brazilian Hospital Hypothermia event number post operations as much as 98 (93.3%) Patients from 105 patients experienced Hypothermia postoperative. The year 2019 54 (69.2%) From 78 experienced hypothermia in the post-anesthesia recovery chamber. In the year 2017 at the RSUD Wates the hypothermia incidence rate as much as 36 (65.5%) Of the 55 patients who post operations. At the Sele Be Solu Hospital the hypothermia incidence is 8 out of 10 patients with an average temperature of 35.8°C. Preliminary study interviews were 38 patients with postoperatively in the Sele Be Solu Hospital.
operating room with several post-operative patients with anesthesia indicates that they often experience cold (hypothermia) while being in the operating room and recovery room.

Hypothermia is classified as induction hypothermia or an accident and secondary hypothermia. An induction or accident hypothermic is caused by low environmental temperature management, dose medications, and certain diseases such as myxedema and hypopituitarism. While secondary hypothermia can occur in surgical patients and cause by several factors such as, due to low temperature in the operating room, infusion with cold liquids, use of inhaled anesthetic techniques with cold gas, cavities or open wounds, muscle activity that decreases during anesthesia, advanced age or the type of medication used during anesthesia.

The occurrence of hypothermia will activate shivering mechanisms as to increase metabolism, muscle activity above normal levels to produce heat, also increases two to three times the consumption of oxygen and CO$_2$ production. Complications in the form of shivering in this case, occur due to skeletal muscle contractions or tremors in the face, chin, and extremities for ±15 minutes accompanied by a process of hypothermia and vasodilation. This condition can make things worse than pain, and disrupt the observation of the patient’s condition and physical comfort$^7$.

The treatment of hypothermia that can be undertaken involves non-pharmacological and pharmacological action. Non-pharmacological therapy techniques can be performed by providing warm blankets, regulating adequate ambient temperatures, as well as using fluid warmers for transfusion and other liquids$^8$-$^{12}$. Interventions to lower the state of postoperative chills can be with active or externally active internal heating. Ambient temperature in the room is recovered, wet dresses and blankets are removed and replaced with a dry because it can enlarge heat loss, intravenous fluid, and irrigation are heated to 37°C.

Regardless of the method used to warm the patient, the reforesting must be carried out gradually and not quickly$^7$. The use of an aluminum foil blanket is a method to stabilize body temperature. Clarissa’s research results, proved that the treatment of hypothermia can be solved by passive warming intervention. The results of the research Marlinda, et al.,$^{13}$ proved that the use of warm blankets that are coated in an aluminum foil is more effective than ordinary warm blanket use in the return speed of post-operation body temperature.

Based on the explanation above, the authors are interested to research on the effect of the use of aluminum foil blanket against an increase in body temperature in patients after spinal anesthesia in Sele Be Solu Hospital.

**Materials and Method**

This type of research uses a Pre-experimental study design with a Pre-PostTest Only Design approach. Pre experiments are experiments that have treatment, impact measurement, union experiment but don’t use assignments randomly to create comparisons to conclude changes that are caused by treatment. Sampling in this study used purposive sampling techniques. The total sample in this study amounted to 12 people. The data collected includes the characteristics of respondents based on age, gender, and body temperature pre and post-intervention using an observation sheet. Data retrieval is carried out at the Sele Be Solu Hospital Sorong for one day while observing the principles of beneficence ethics, respect for human dignity, and justice. Analysis of data using the Shapiro-Wilk test, Homogeneity of Lavene Test, and Paired sample T-Test.

**Results**

The collection of data on this research has been conducted at the Sele Be Solu Hospital in Sorong for 8 days on 18-25 March 2020. Characteristic data includes age and gender. The average age of respondents was 42.92 (± 9700). Male-gender respondents numbered four (33.3%) Female gender amounted to 8 (66.7%). Variable temperature data using the Paired test sample T-Test indicates there is a significant influence on the increase in body temperature after the intervention (P = 0.000).

**Table 1: Results analysis of Pre-Test and Post-Test use of Aluminium Foil blanket against an increase in body temperature in patients with hypothermia after spinal anesthesia**

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Mean±SD</th>
<th>Min</th>
<th>Max</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre- Test</td>
<td>34.6±0.5444</td>
<td>33.7</td>
<td>35.8</td>
<td>0.000*</td>
</tr>
<tr>
<td>Post-Test</td>
<td>36.7±0.1055</td>
<td>36.5</td>
<td>36.9</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at $\alpha = < 0.05$
DISCUSSION

Based on the results of the study showed the age characteristics of the most respondents were at vulnerable age 46-55 which amounted to six respondents with a presentation of 50% and the lowest was at the age of 16-25 which amounted to one respondent with a presentation of 8.3%. It is shown that the elderly are one of the factors affecting hypothermia post-anesthesia. This can occur because when a person enters the age of the elderly, the state of cells in the body will change. The thermoregulation system will be disrupted so the elderly are more likely to experience loss of body temperature. Anesthesia that is done in elderly patients can lead to a shift in the thermoregulation threshold with greater degrees compared to young patients.14

This research is in line with the research conducted by Amila Hanifa,6 which suggests that patients who often experience hypothermia are at the age range of 46-60 years with a total of 21 (38.2%) of 55 patients. Another research in line is the research conducted by Harahap, indicating that the incidence of hypothermia in the elderly reached 113 (87.6%) of 129 patients. While the research is not in line with this study, the research conducted by Clarissa,15 showed that elderly patients who experienced hypothermia only 20 (19%) of 105 patients.

The results showed that most respondents were female genders of 8 respondents with a 66.7% presentation. This suggests that gender is one of the factors affecting hypothermia post-anesthesia. Men and women have a difference in body temperature consistency. In general, women have a larger body temperature fluctuations than men. This happens because of the effect of the hormonal production of progesterone hormones. If the hormone progesterone decreases, then the body temperature decreases a few degrees below the normal limit.14

This research is in line with research conducted by Mendone,16 which shows the number of hypothermia in female gender reaches 62 (79.48%) of 78 patients. The results of this research is also in line with the research conducted by Harahap,14 explained that more hypothermia number in women is 51.2%. The results of other studies in line with this study were research conducted by Clarissa,17 explaining that female patients experiencing hypothermia reached 73 (69.5%) of 105 patients.

The characteristic of an aluminum foil is strong, lightweight, heat resistant, and almost airtight, which doesn’t contain magnets.18 An aluminum foil blanket is a method used to increase body temperature in preterm hypothermia due to an air resistant aluminum foil. Aluminum foil blankets can also be used to cope with and increase body temperature in patients with hypothermia due to the environment. Patients who experience hypothermia are caused by too cold room temperature, infusion with cold liquids, cold inhalation, decreased muscle activity, or the influence of drugs used such as vasodilators, spinal and generalized anesthesia.19-22

In the first hour after spinal anesthesia administration will occur decreased shivering threshold of about 1°C up to 2°C. Anesthesia affects all three thermoregulation elements consisting of afferent input elements, signal settings in the central area as well as the effusive response otherwise, it can also eliminate the adaptation process as well as disrupt the mechanism of fat or skin physiology in thermoregulation function. At the time of administration of anesthesia spinal body undergo vasodilation. This is what makes the body’s metabolism increased so that the body experiences a decrease in temperature.3

The use of heat-resistant aluminum foil covers and air can make the body vasoconstriction because the blanket of aluminum foil minimizes the body or skin to interact with air or the stimulus resulting in hypothermia. When the body does not get the stimulus, the body will undergo vasoconstriction due to heat restrained with an aluminum foil blanket. So slowly the body temperature will begin to increase to normal body temperature.3

Research conducted by Marlinda, Ramdani, and Mariana,19 concluded that there is an influence on the blanket of warm coated aluminum foil blanket to increase the body temperature of the patient’s hypothermia post-SC. Another research result that can support this research is research conducted by Jessica Watson3 concluded that the blanket of aluminum foil or warm blanket can also handle the problem of postoperative hypothermia.

This research is in line with previous related studies where there is an influence on the use of aluminum foil blankets against increased body temperature in patients with hypothermia after spinal anesthesia. The use of aluminum blankets within 10 minutes can make the blood vessels that have been vasodilation transformed into vasoconstriction. So that the blanket aluminum foil can be used to overcome the problem of post-anesthesia hypothermia.
Conclusion

Aluminum foil blankets are effective in increasing the body temperature post-spinal anesthesia. For nursing services, researchers recommend the blanket aluminum foil intervention can be used as standard operational procedures against hypothermia after spinal anesthesia. For further researchers to examine the factors affecting hypothermia post-anesthesia such as old surgery, body mass index, and anesthesia type. Further researchers can also add samples and compare blankets of aluminum foil to the increase in the body temperature of post-spinal anesthesia.

Ethical Clearance: Taken from Poltekkes Kemenkes Sorongethical committee

Source of Funding: Poltekkes Kemenkes Sorong

Conflict of Interest: Nil

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Analysis of Risky Behavior towards Sexual Transmitted Infections (STIS) in the Community Health Center of Bintuni, West Papua

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Abstract

The problem of STIs in Indonesia is believed to be like an iceberg phenomenon because the official report on the number of cases does not reflect the real problem. There is a high number of asymptomatic cases that the sufferer does not feel sick but can transmit the infection to other people. This study aims to analyze risky behavior towards STI incidents in the work area of the Community Health Center (Puskesmas) of Bintuni. This is analytic observation research, with a case-control design. A case-control study is carried out by identifying the case group and the control group, then retrospectively, the risk factors for STIs in the work area of the Community Health Center of Bintuni were examined with a total of 102 respondents, each group of cases and a control group of 51 respondents. Data were analyzed using SPSS to test the Odd Ratio. Results: The analysis of knowledge resulted in the OR value of 2.771, the analysis of attitude resulted in the OR value of 1.4644. Knowledge and attitude are risk factors for the incidence of STIs. This study suggests improving health education, especially about STIs, and the health office and health agencies should be more proactive in early detection of STI cases in the community.

Keywords: Knowledge, attitude, action, sexually transmitted infections.

Introduction

Sexually transmitted infections (STIs) are infections caused by bacteria, viruses, parasites, or fungi, which are transmitted primarily through sexual contact from an infected person to their sexual partners¹. STIs are one of the top ten causes of unpleasant disease in young adult men and the second most common in young adult women in developing countries².

According to the CDC in Upik et.al, the incidence of STIs out of 340 million new curable cases (syphilis, gonorrhea, chlamydial infections, and trichomonas infections) occurs annually in men and women aged 15-49 years. Epidemiologically, the disease is spread throughout the world, with the highest incidence rates recorded in South and Southeast Asia, followed by Saharan Africa, Latin America, and the Caribbean. In America, the number of women who suffer from chlamydial infections is 3 times higher than men. Of all women who suffer from chlamydial infections, the age group that makes the biggest contribution is those aged 15-24 years³.

The prevalence of STIs in developing countries is much higher than in developed countries. In pregnant women globally, the incidence of gonorrhea is 10-15 times higher, chlamydia infection is 2-3 times higher, and syphilis is 10-100 times higher than the incidence of pregnant women in industrialized countries. Adolescents (15-24 years) are 25% of all sexually active populations but account for nearly 50% of all new STI cases acquired. The detected STI cases represent only 50%-80% of all STI cases in America. This reflects the limitations of screening and the lack of news coverage of IMS².

In Indonesia, based on the Integrated Biological and Behavioral Survey Report (IBBS) by the Indonesian
Ministry of Health, the prevalence of STIs in 2013 showed that gonorrhea infection was 99.2%, chlamydia was 125.1% and syphilis was 36.6%. While the prevalence of HIV was 68.9%.

Everyone who is sexually active can contract an STI. But, there are several groups of people that have to be watched out for because they have a high risk of spreading the IMS, such as the people who like to keep changing their sexual partners and those who had only one sexual partner, but their sexual partners like to keep changing their sexual partners.

The problem of STIs - HIV in Indonesia is believed to be like an iceberg phenomenon because the official report on the number of cases does not reflect the real problem. The number of asymptomatic cases so that the sufferer does not feel sick, but can transmit the disease to other people. The first step in overcoming this problem is that we must have supporting and accurate data. Many data on STIs - HIV has been found and various prevention efforts have been made. However, the trend of increasing the number of STI cases and finding new HIV cases continues to increase.

Based on the description of the background above, the researchers interested in conducting a study with the title “Analysis of Risky Behavior Towards Sexual Transmitted Infections (STIs) In The Community Health Center of Bintuni, West Papua”.

**Method**

This is analytic observational research, with a case-control design. Case-control is a study conducted by comparing two groups, namely the case group and the control group.

The case population in this study were clients who had medical treatment and doctor diagnoses infected with sexually transmitted diseases (STIs) in the work area of the Bintuni Community Health Center as many as 82 clients and the control population in this study were clients who came to the health center for STIs test through laboratory examinations and were declared not infected by STIs. The sample size was 102 with a ratio between cases and controls 1: 1 = 51 cases and 51 controls. The research was conducted in outpatient services and STI service units at the Bintuni Community Health Center.

The number of STIs cases as the number of cases of Urethral Body Duh (DTU) from January to December 2016, was reposted as many as 10,672 cases and cases of genital ulcers/genital ulcers were reported as many as 1,628 cases. Cases of Sexually Transmitted Infection (STI) based on the syndrome and laboratory approach per risk group in 2016 for national Female Sex Workers/FSW (89,792), Male Sex Workers/MSW (506), Trans-women (6,951), Gay men (39,681), Injected Drug Users/IDU (4,425), High Risk Couples/HRC (93,520), Sex Worker Customers/SWC (14,043), and Others (192,786). For West Papua Province, the risk groups in 2016 were FSW (1,301), MSW (-), trans-women (7), gay men (7), HRC (32), SWC (543) and others (6,182) (SIHA MOH, 2016).

The number of pregnant women who visited the ANC for the first time and tested for syphilis at the national level was 43,873 people and 4,169 pregnant women who tested positive for syphilis and 1,254 pregnant women who were treated for syphilis were in West Papua. The number of pregnant women who first visited the ANC and were tested for syphilis was 1902, 120 people, and pregnant women who tested positive for syphilis and 60 people who were treated for syphilis. In one of the districts in West, Papua is TelukBintuni Regency, the number of STI cases in 2016 for the Bintuni Community Health Center was 94 cases and in 2017 from January to October there were 82 cases. Data on the latest HIV transmission pathways reported by the Directorate General of Disease Control and Environmental Health, Indonesian Ministry of Health, in the SIHA report per December 2016 according to risk factors is through heterosexual 17,754 cases, gay men 13,063 cases, others 5,479 cases and 12,479 unknown cases. The percentage of HIV infection reported by sex was male 63.3% and female 63.7%, while the percentage of HIV infection reported by age was ≤ 4 years 2.2%, 5-14 years 1.0%, 15 -19 years 3.7%, 20-24 years 17.3%, 25-49 years 69.3%, ≥ 50 years 6.5%.
Results

1. Univariate Analysis:

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Sexually Transmitted Infection Incidence</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Case</td>
<td>Control</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
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<tr>
<td>15-24 years</td>
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<td>20</td>
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<td>25 - 49 Years</td>
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<tr>
<td>Housewife</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Sex worker</td>
<td>47</td>
<td>39</td>
</tr>
<tr>
<td>Unemployed</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Amount</td>
<td>51</td>
<td>51</td>
</tr>
</tbody>
</table>

Based on table 1 above, it shows that most case groups were respondents aged 25-49 years, which was 66.7%, while in the control group the most were respondents aged 25-49 years, which was 56.9%. In the respondents’ gender cases and the control group had the same number of respondents, most respondents were females at 96.1%. At the education level of the respondents, the case group at the junior and senior high school education level had the same high proportion, which was 43.1%, while the control group had the highest proportion of respondents with high school education, which was 47.1%. Based on marital status in the case group and the control group, the highest proportions were respondents with widow status, 58.8%, and 49% respectively. Most respondents in the case and control groups were female sex workers, 92% and 76.4%, respectively.
The analysis Bivariate risk behaviors to the incidence of Sexually Transmitted Infections

a. Knowledge

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sexually Transmitted Infection Incidence</th>
<th>Amount</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Case</td>
<td>Control</td>
<td>n</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td>Less</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Well</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Amount</td>
</tr>
</tbody>
</table>

Based on Table 2, it shows that the comparison of proportions between cases and controls, respondents with less knowledge, higher in case group (37.3%) compared with the control group (17.6%). The results of the odds ratio test show the value of OR = 2.771; 95% CI = 1.108-6.931, which means that knowledge is a risk factor for the incidence of STIs.

b. Attitude

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sexually Transmitted Infection Incidence</th>
<th>Amount</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Case</td>
<td>Control</td>
<td>n</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td>Less</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Well</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Amount</td>
</tr>
</tbody>
</table>

Based on Table 3, it shows that 13.7% of respondents in the case group had less attitude, higher compared to the control group by 9.8%. Based on the results of the analysis, the OR = 1.464; CI 95% = 0.432-4.957, which means that attitude is a risk factor for the incidence of sexually transmitted infections.

Discussion

Knowledge risk of the incidence of sexually transmitted infections: Based on the results, it shows that the largest proportion of respondents in the control group good knowledge i.e., 82.4% compared to the case group that was 62.7%. While the largest proportion of respondents that has a lack of knowledge in the case group is 37.3% and 17.6% in the control group. The results of the analysis of odds ratio OR = 2.771; 95% CI = 1.108-6.931, which means that knowledge is a risk factor for the incidence of sexually transmitted infections (STIs). One of the factors affecting knowledge is the level of education. The higher a person’s education, the better the knowledge about the risk of sexually transmitted infections, and vice versa. Table 1, shows that only 3.9% of respondents were highly educated so that knowledge about the risk of sexually transmitted infections was lacking which had an impact on the risk of exposure.

The results of this study are not in line with the results of research by Masni (2016), concerning risk factors for sexually transmitted infections at the Kalumata Health Center, Ternate City which shows that knowledge is not a risk factor for the incidence of sexually transmitted infections, because knowledge has a major contribution in changing one’s behavior to behave both positively and negatively. Sufficient knowledge about sexually
transmitted diseases encourages a person to be more aware of diseases that can be transmitted through sexual activity\textsuperscript{10}.

The results of this study are also in line with the results of Ristiani’s\textsuperscript{11} research on the relationship between the level of knowledge about infectious infections and premarital sex attitudes in 8\textsuperscript{th}-grade students at Muhammadiyah 9 Junior High School, Yogyakarta, which states that there is a significant relationship about the level of knowledge about sexually transmitted infections with premarital sex attitudes in 8\textsuperscript{th}-grade students.

Anyone that sexually active is at risk of contracting an STI. Factors that increase the risk include having sex without a condom, having sex with a changing partner, the behavior of a high-risk sexual partner, and having a history of STIs\textsuperscript{12}.

Risk Factors Attitudes towards the incidence of sexually transmitted infections: The results showed that 13.7\% in the case group had a poor attitude was higher than 9.8\% in the control group with the test results show the value of the odds ratio OR = 1.464; CI\textsubscript{95\%} = 0.432-4.957 which means that attitude is a risk factor for the incidence of sexually transmitted infections.

According to Gerungan\textsuperscript{13}, an attitude is a person’s opinion or view of an object that precedes his action. Attitudes may not be formed before receiving information, seeing, or experiencing an object. Adult age can form a person’s opinion or a wider viewpoint about an object. There are 61\% of respondents who are adults but do not make a positive contribution to healthy behavior.

The results of this study are not consistent with the results of research by Gani\textsuperscript{14} about the relationship of knowledge, attitudes, and behavior towards the incidents of Sexually Transmitted Infections in housewives at Bukittinggi, West Sumatra province that showed attitude is not a risk factor for the incidence of sexually transmitted infections (OR = 0.99).

Attitudes often reflect a person’s personality because they are inseparable from the person who supports them. Therefore, by looking at the attitude of a certain object, more or fewer people can know that person’s personality. So attitude is a personal statement\textsuperscript{15-23}.

In general, respondents have a good attitude in preventing sexually transmitted infections, including the statement that using condoms is a safe way to prevent STI transmission, having more than 1 sexual partner can be at risk of contracting STIs, anal sex is very risky of contracting STIs, sucking or putting genitals into the mouth (Oral sex) can be very risky of contracting STIs, however, a person’s attitude can change due to the state of the human being that moves to act or act in social activities with certain feelings in response to the object of the situation or conditions in the surrounding environment\textsuperscript{6}.

Acknowledgment: Thank you to the Head of the Bintuni Community Health Center who has permitted the researchers to conduct this research.

Ethical Clearance: Taken from Poltekkes Kemenkes Sorong ethical committee

Source of Funding: Poltekkes Kemenkes Sorong

Conflict of Interest: Nil

Reference


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Supplementary Feeding Development of Koya Powder Based on Rebon Shrimp (Mysis Relicta) towards Changes in Blood Biochemistry of Pregnant Women as Risk Factor of Linier Growth Disturbance (Stunting)

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¹Lecturers of Poltekkes Kemenkes Sorong, ²Professor of Environmental Health Department, Faculty of Public Health, Hasanuddin University, Makassar

Abstract

Indonesia is ranked 5th in the world and 3rd in Southeast Asia with the highest number of stunted children under five. West Papua Province in 2018 is included in 18 provinces with a high prevalence of around 30%-<40%. Stunting is one of the nutritional problems that occur from the pre-conception period, and will continue until pregnancy which can affect the baby being born. One of the efforts that can be done by giving rebon shrimp, its content which is rich in micronutrients can be an alternative food choice for improving blood biochemistry of pregnant women. The purpose of this study is to analyze the differences in blood biochemical levels of pregnant women (serum protein, serum albumin and hemoglobin levels) before and after consuming the supplementary feeding of Koya Powder made from Rebon Shrimp. This study used a quasi-experimental method with a group design post-test control approach. The total sample size is 15 respondents per group, using the incidental technique. The intervention group was given koya powder as much as 100 grams/day for 7 days, while the control was given education on nutritious foods and eating according to the daily pattern. The research was conducted in the work area of the West Sorong Health Center and Malawili Public Health Center, data collection was carried out from 31 August 2020 to 06 October 2020, using an observation sheet. Data analysis used the Mann-Whitney test, if the data were not normally distributed, use the free sample t2 test. The results of the study were significant differences between the control group and the intervention group with a P value of 0.000 <0.05. Conclusion “There is an Effect of Consumption of Supplementary Feeding Koya Powder Made from Rebon Shrimp (Mysis Relicta) on Changes in Serum Protein, Serum Albumin and Hemoglobin Levels for Pregnant Women as Risk Factors for Stunting.”

Keywords: Rebon Shrimp, Blood Biochemical, Stunting and West Papua.

Introduction

Based on data from the World Health Organization (WHO), South East Asia Regional (SEAR), Indonesia is in the third highest position with an average of around 36.4% of children under five with stunting in 2005-2017. Riskesdas,¹ For this reason, referring to the RPJMN (National Medium-Term Development Plan) target in 2019, it is expected that the number of babies under two years of stunting in Indonesia can reach a figure below 28%. Based on data from Riskesdas (Basic Health Research) in 2013, around 37.2% (9 million) of children under five were stunted, so that Indonesia was ranked 5th in the world.²

The latest Riskesdas in 2018 shows a decrease in the prevalence of children under five with very short and short criteria by 30.8%, although there has been a decrease in cases but has not reached the expected target Riskesdas.¹ West Papua Province in 2018 is included in 18 provinces with a high prevalence of around 30%-<40% of cases are short and very short with indicators of height according to age (Height/Age), where the very short category is TB/U <-3SD and the short category Height/Age ≥-3SD to <-2SD. Priority for subscribing to stunting intervention is focused on 3 loci, namely Sorong City, South Sorong Regency and Tambraw.²
Stunting is one of the nutritional problems experienced by children under five today, the results of an analysis of 217 national Demographic and Health surveys from 67 countries with ≥2 surveys between 1993 and 2014, showed the average prevalence of stunting in 1993 was 53.7% in low-income countries and 48.2% in middle-income countries. Stunting occurs from the pre-conception period, the condition is lack of nutrition and anemia is one of the triggers. This condition will get worse when entering conception because of insufficient nutritional intake to meet needs. Mothers with infection and/or chronic disease directly contribute to micronutrient deficiencies that inhibit nutrient absorption. During pregnancy, increased nutritional intake is required, micronutrient deficiency which less exacerbates this period. Evidence suggests that repeated pregnancies with short intervals between pregnancies contribute to the micronutrient status of pregnant women. Micronutrient deficiency is associated with a number of adverse outcomes for both mother and baby. The impact of lack of nutrition during pregnancy will affect the level of intelligence, and are more susceptible to disease. Efforts to prevent and reduce stunting by addressing these factors use a life-cycle approach. WHO recommends iron folic acid supplementation of 30-60 mg of elemental iron and 400 μg of folic acid per day. Rebon shrimp is included in the type of shrimp, according to the Ministry of Health in 2005: 9 quoted in Syarif et al., that every 100 grams of dried rebon shrimp contains 295 cal calories, 62.4 g protein, 2.3 g fat, 1.8 grams of carbohydrates, 1209 mg of calcium, 1225 mg of phosphorus, 6.3 mg of iron, 210mg of vitamin A, 0.14mg of vitamin B1, 20.7g of water.

The high number of cases of linear disorders in infants and the importance of addressing this problem, the researchers want to explore the potential of Papua’s marine resources, to be used as an alternative food choice through research “Supplementary Feeding Development of Koya Powder Based on Rebon Shrimp (Mysis Relicta) Towards Changes In Blood Biochemistry Of Pregnant Women As Risk Factor Of Linier Growth Disturbance (Stunting)” with the hope that the results of this study can be useful for the Papuan people, to raise local food wisdom.

Materials and Method

This study used a quasi experimental design, with a pretest-posttest control group design. Before and after the intervention, a pregnant woman’s blood biochemistry will be examined (Serum Protein, serum albumin and hemoglobin). This research has passed the ethics test by the Ethics Team of the Health Polytechnic of the Ministry of Health in Sorong and has obtained a research permit. The sample in this study were 30 pregnant women, using the Cluster Random Sampling technique. Samples were divided into 2 groups with the same number, the intervention group was given koya powder as much as 100 grams/day for 7 days and the control group was given health education on nutritious food by consuming a daily diet, for SF tablets still consumed in both groups. Rebon Koya powder is made by the research team with a composition of 20% shrimp crackers and 80% rebon shrimp. The research instrument used an observation sheet to assess changes in serum protein levels which were categorized as Low if <6.40 g/dl and Normal if Normal> 6.40 g/dl. To assess changes in serum albumin levels, it is categorized as Low if <3.4 mg/dl and Normal if> 3.4 mg/dl. Meanwhile, to assess changes in serum hemoglobin levels in the category Low if <10.5 g/dl and Normal if> 10.5 g/dl. Blood Biochemistry before and after intervention in both the intervention and control groups used a paired T test if the data were normally distributed and used the Wilcoxon test if not normally distributed. Meanwhile, to measure differences in Blood Biochemistry before and after intervention between the intervention and control groups using the Mann-whitney test if the data are not normally distributed. If the data are not normally distributed using the free sample t2 test, because the data are not paired.
Results and Discussion

1. Univariate analysis

a. Characteristics of Research Subjects: Respondent characteristics include age, religion, occupation, parity and gestational age. For more details, see the description below:

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Intervention (n=15)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
</tr>
<tr>
<td>1.</td>
<td>Age</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;20</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>20-35</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>&gt;35</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>15</td>
</tr>
<tr>
<td>2.</td>
<td>Religion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Islam</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Protestant</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Catholic</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>15</td>
</tr>
<tr>
<td>3.</td>
<td>Occupation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Housewife</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Non Housewife</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>15</td>
</tr>
<tr>
<td>4.</td>
<td>Parity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 (Primigravida)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2-5 (Multigravida)</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>&gt;5 (Grandemultipara)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>15</td>
</tr>
<tr>
<td>5.</td>
<td>Gestational Age</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1-13 weeks (TM 1)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>14 – 26 weeks (TM 2)</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>27 -40 weeks (TM 3)</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

Table 1 shows that the characteristics of respondents based on age in the intervention and control group were mostly at the age of 20-35 years, in the intervention group as many as 14 respondents (93.3%) while in the control group as many as 13 respondents (86.6%). For the characteristics of respondents based on religion, both the intervention and control groups were mostly Muslim, in the intervention group there were 15 respondents (100%) while the control group was 11 respondents (73.3%).% Housewife. Characteristics of Respondents based on parity in the intervention and control groups mostly in the 2-5 children or multigravida group. The intervention group was 12 respondents (80%), while in the control group there were 10 respondents (66.6%). Characteristics of respondents based on gestational age in the intervention group were mostly in the gestational age group in trimester 2 ranging from 27-40 weeks of gestation as many as 8 respondents (53.3%). Whereas
in the control group, most of them were in the 2nd and 3rd trimesters of pregnancy, each of which were 7 respondents (46.6%).

b. **Like or Organoleptic Test:** To assess the texture, taste, color and aroma between formula A and formula B. More details can be seen in Table 2 below:

<table>
<thead>
<tr>
<th>Type of Treatment</th>
<th>Preferred Level</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formula A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texture</td>
<td>4</td>
<td>Like</td>
</tr>
<tr>
<td>Taste</td>
<td>5</td>
<td>Very Like</td>
</tr>
<tr>
<td>Color</td>
<td>4</td>
<td>Like</td>
</tr>
<tr>
<td>Aroma</td>
<td>4</td>
<td>Like</td>
</tr>
<tr>
<td>Formula B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texture</td>
<td>2</td>
<td>Dislike</td>
</tr>
<tr>
<td>Taste</td>
<td>3</td>
<td>Neutral</td>
</tr>
<tr>
<td>Color</td>
<td>2</td>
<td>Dislike</td>
</tr>
<tr>
<td>Aroma</td>
<td>2</td>
<td>Dislike</td>
</tr>
</tbody>
</table>

In the preference test of 10 panelists, it shows that the respondent prefers the texture of Formula A, for the taste the Respondents really like formulation A. As for the color and aroma of the Respondents like formulation A. Thus, the formula used for this study is Formula A.

c. **Compliance Test:** To measure Respondents’ compliance to consume Koya Shrimp Rebon Powder per day. More details can be seen in table 3 below:

<table>
<thead>
<tr>
<th>No.</th>
<th>Compliance Level</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (25gr/day)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Medium(50gr/day)</td>
<td>1</td>
<td>6.6</td>
</tr>
<tr>
<td>3</td>
<td>High(100 gr/day)</td>
<td>14</td>
<td>93.3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>15</td>
<td>100%</td>
</tr>
</tbody>
</table>

Based on Table 3 regarding the compliance of Respondents consuming Koya Powder for 1 week with a frequency of 25 x 4/day (Total 100 gr/day), it shows that as many as 14 respondents (93.3%) have a high level of compliance while 1 respondent (6.6%) have a moderate level of adherence, this is because the mother has entered the final week of preparation for delivery so that the desire to eat has decreased.

d. **Blood Biochemical Levels of Pregnant Women Before And After Intervention:** Measuring the average blood biochemistry includes Serum Protein, Serum Albumin and Hemoglobin before and after the intervention for 7 days. More details can be seen in table 4 below:

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean±Std. Deviation</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beginning</td>
<td>End</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hb</td>
<td>Protein</td>
<td>Albumin</td>
</tr>
<tr>
<td>Intervention</td>
<td>10.45±1.189</td>
<td>5.867±0.5948</td>
<td>3.527±0.4183</td>
</tr>
<tr>
<td>Control</td>
<td>11.51±1.1575</td>
<td>7.113±1.1904</td>
<td>3.580±0.3075</td>
</tr>
</tbody>
</table>

Table 4 above shows that the mean results of changes in the blood biochemical content of pregnant women in the control group were smaller than the intervention group. After that, the univariate test will be carried out with the Paired Samples Test. The normality test will be carried out first, which aims to determine how the distribution of data is needed and determine the data that has been collected is normally distributed or taken from the normal population. The normality test was carried out using the Shapiro-Wilk method because the sample data in each group was less than 50 samples. If p> 0.05 is obtained, the data is normally distributed. The results of the normality test can be seen in Table 5 below:
From table 5 above, it is found that some data are normally distributed and not. After the normality test, the Paired Samples Test will be carried out on the HB sample of koya powder, koya protein powder and control albumin. The Paired Samples Test is a two-time difference test for data that is normally distributed and is used to see changes in giving Supplementary Feeding of koya powder before and after being treated. For the other sample, the Wilcoxon test was carried out because the data distribution was not normally distributed. If $p < 0.05$ then there is a significant difference.

The results of the Paired Samples Test and Wilcoxon test in Table 6 above, for the whole sample experienced a significant difference, only control albumin is not. To prove the difference in the effectiveness of Supplementary Feeding of koya powder on changes in blood biochemistry of pregnant women, a bivariate test was carried out using the Independent Samples Test. Data normality testing is required to meet the requirements of the Independent Samples Test.

### Table 5. Univariate Normality Test Results Using Shapiro Wilk

<table>
<thead>
<tr>
<th>Data</th>
<th>Gis</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention Group HB Before</td>
<td>0.323</td>
<td>The data is normally distributed</td>
</tr>
<tr>
<td>Intervention Group HB After</td>
<td>0.155</td>
<td>The data is normally distributed</td>
</tr>
<tr>
<td>Intervention Group of Serum albumin Before</td>
<td>0.022</td>
<td>The data is not normally distributed</td>
</tr>
<tr>
<td>Intervention Group of Serum albumin After</td>
<td>0.007</td>
<td>The data is not normally distributed</td>
</tr>
<tr>
<td>Intervention Group Protein Serum Before</td>
<td>0.314</td>
<td>The data is normally distributed</td>
</tr>
<tr>
<td>Intervention Group Protein Serum After</td>
<td>0.230</td>
<td>The data is normally distributed</td>
</tr>
<tr>
<td>Group Control HB Before</td>
<td>0.004</td>
<td>The data is not normally distributed</td>
</tr>
<tr>
<td>Group Control HB After</td>
<td>0.006</td>
<td>The data is not normally distributed</td>
</tr>
<tr>
<td>Group Control Protein Serum Before</td>
<td>0.048</td>
<td>The data is not normally distributed</td>
</tr>
<tr>
<td>Group Control Protein Serum After</td>
<td>0.366</td>
<td>The data is normally distributed</td>
</tr>
<tr>
<td>Group Control Albumin Serum Before</td>
<td>0.142</td>
<td>The data is normally distributed</td>
</tr>
<tr>
<td>Group Control Albumin Serum After</td>
<td>0.423</td>
<td>The data is normally distributed</td>
</tr>
</tbody>
</table>

### Table 6. Univariate Test Results Using Paired Samples Test and Wilcoxon

<table>
<thead>
<tr>
<th>Data</th>
<th>Gis</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>HB Before And After Intervention Group</td>
<td>0.002</td>
<td>There is a significant difference</td>
</tr>
<tr>
<td>Albumin Serum Before And After Intervention Group</td>
<td>0.003</td>
<td>There is a significant difference</td>
</tr>
<tr>
<td>Protein Serum Albumin Serum Before And After Intervention Group</td>
<td>0.003</td>
<td>There is a significant difference</td>
</tr>
<tr>
<td>HB Before And After Control Group</td>
<td>0.002</td>
<td>There is a significant difference</td>
</tr>
<tr>
<td>Albumin Serum Before and After Control Group</td>
<td>0.767</td>
<td>There is no significant difference</td>
</tr>
<tr>
<td>Protein Serum Albumin Serum Before and After Control Group</td>
<td>0.003</td>
<td>There is a significant difference</td>
</tr>
</tbody>
</table>

2. **Bivariate Analysis**: To see the relationship between the dependent variable and the independent variable. So to measure the differences in blood biochemistry of pregnant women, before and after intervention between the intervention and control groups used the Mann-Whitney test, if the data were not normally distributed. If the data are not normally distributed using the free sample $t_2$ test.
Table 7. Bivariate Normality Test Results Using Kolmogorov Smirnov Z

<table>
<thead>
<tr>
<th>Group</th>
<th>Gis</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test of normality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>0.000</td>
<td>Data is not normally distributed</td>
</tr>
<tr>
<td>Control</td>
<td>0.000</td>
<td>Data is not normally distributed</td>
</tr>
</tbody>
</table>

From Table 7 above, it is found that the data are not normally distributed. After that, the homogeneity test was carried out with the Levene test to see whether the data variance was homogeneous or not. The results of the homogeneity test of the data variance are not homogeneous. The data are not normally distributed and are not homogeneous so that the Independent Sample Test cannot be done. The results of the homogeneity and normality test meet the requirements of the Mann Whitnney test.

It is found that the data variance is not homogeneous, which means that all the requirements are met. After that, the Mann Whitnney test is carried out with the results in Table 9, the results show that there is a significant difference. The conclusion of the null hypothesis is rejected thus “There is an Effect of Consuming Supplementary Feeding of Koya Powder Made from Rebon Shrimp. (Mysis Relicta) Towards Changes in Serum Protein, Serum Albumin, and Hemoglobin Levels for Pregnant Women as Risk Factors for Stunting.

Discussion

Characteristics in the age group of respondents, both the intervention and control groups, are mostly at the age of 20-35 years, this is a safe gestational age and delivery because at this age the mother is physically and mentally ready to face pregnancy and childbirth besides that the risk of anemia is very low. A study conducted by Zahidatul 8 shows that pregnant women aged <20 years have a 2,250 times greater risk of anemia and >35 years of age have a risk of experiencing anemia 5.885 times greater than those of 20-35 years. However, this is not in line with the data obtained by researchers where there are still respondents who have low hemoglobin levels <10.5 g/dl, even though the percentage is below 50%.

Respondents in both groups are 100% unemployed, meaning that mothers carry out their daily obligations as housewives, the group of mothers who do not work is a group that is prone to suffering from anemia, where the data shows that mothers who do not work have a 1.990 greater chance of experiencing anemia compared to working pregnant women. Mothers who do not work have to do hard work during pregnancy to meet their needs. In addition, this group tends to have a lower socioeconomic status so that nutritional needs are not fulfilled.

Parity in the intervention and control groups mostly at parity of 2-5 children, the number of children greatly affects the nutritional status of children under five. Toddlers from families with a large number of household members are 1.34 times more likely to experience stunting compared to toddlers from families with sufficient household members. Mothers who had many children under five had a 3.25 times greater risk of stunting than respondents who had mothers with little parity lack of time in sharing attention to children, the limited food consumed by children is a trigger factor.

There is a significant difference between mothers who were given rebon shrimp koya powder and mothers who were only given education to eat according to their daily diet. Giving rebon shrimp koya powder can meet 70 KKal, with a composition of 41 mg of Calcium (Ca), 265 mg of protein, 21.4 mg of Fe, 0.06 mg of Vitamin B1 and 21.6 grams of water. Protein content in the body functions as a means of transporting iron. Consumption of foods high in protein can increase hemoglobin levels. This is in line with research conducted in Sorong Regency, 2019, showing that women of childbearing age who consume shellfish biscuits can significantly increase their hemoglobin levels because shellfish are rich in protein.

While the content of Calcium (Ca) affects genetic programs that determine height. If calcium intake is reduced it will cause low blood calcium levels and can interfere with the genetic high process. Calcium (Ca), phosphorus (Pi), and Magnesium (Mg) are the main minerals in fetal bone mineralization. Low levels of calcium in maternal serum can cause low serum Ca levels in the fetus.

Serum albumin levels are essential during pregnancy for good delivery outcomes, Department of Obstetrics
Pregnant women who are deficient in zinc can cause gestational hypertension, defects in fetal nerves, premature rupture of membranes, low birth weight, poor neurodevelopmental behavior, cognitive impairment, intrauterine growth retardation, impaired glucose tolerance, congenital malformations, stillbirth, premature labor, postpartum hemorrhage, prolonged labor, inadequate uterine contractions, abnormalities in gene replication, delayed immune system development leading to increased neonatal morbidity and mortality. Serum albumin acts as an antioxidant in the body, low albumin levels in pregnant women are closely associated with the incidence of gestational diabetes. Decreased albumin levels are due to malnutrition.

Maternal nutritional status during pregnancy greatly affects the risk factors for stunting in children. Hardening of the bones begins approximately in the sixth week of embryonic development and continues until the end of pregnancy. However, an insufficient supply of nutrients in pregnant women impairs fetal growth. The results showed that maternal nutritional status during pregnancy was significantly associated with stunting in children (p-value: 0.000). The OR value is 13,222, which means that children born to mothers with insufficient nutritional supply during pregnancy are 13,222 times more likely to suffer from stunting than children born to mothers with good nutrition supplies.

Linear growth failure is the most common form of malnutrition globally. With an estimated 165 million children under 5 years of age affected, stunting has been identified as a top public health priority, and there are ambitious targets to reduce stunting prevalence by 40% between 2010 and 2025. We view this condition as a ‘stunting syndrome’ in which several pathological changes characterized by decreased linear growth in early life are associated with increased morbidity and mortality, decreased physical capacity, neurological and economic development and an increased risk of metabolic disease into adulthood. tend to have neglected offspring, creating an intergenerational cycle of poverty and depletion of human resources that is difficult to break.

Deficiency of micronutrients is one of the triggers for stunting in addition to non-optimal breastfeeding and complementary feeding practices, as well as recurrent infections. In the antenatal period Fetal growth is regulated by a complex interaction of maternal nutritional status, endocrine and metabolic signals, and placental development. For this reason, prenatal micronutrients and provision of balanced energy and protein for mothers can reduce the incidence of stunting by 9% and 31%. Daily iron supplementation during pregnancy reduces low birth weight by 20%.

Stunting reflects poor nutrition and frequent infections can lead to poor cognitive, motor and socio-economic development. Globally, one fifth of pregnant women develop iron deficiency anemia during pregnancy. A meta-analysis showed that anemia during the first or second trimester increases the risk of prematurity and low birth weight. The WHO recommends 60 mg of iron daily during pregnancy, however, a randomized controlled trial in Bangladesh showed that supplementing iron with multiplemicronutrient intake had a slightly more effect on children’s body length at birth, first, third and sixth month. Thus, the addition of micronutrients with iron tablets to pregnant women will have a more positive impact on linear disturbances in babies born.

**Conclusion**

1. The mean serum protein level before consuming the Supplementary Feeding of Rebon Shrimp-based Koya Powder in the Intervention Group was 5,867 ± 0.5948 and after it was 6,493 ± 0.8388. The mean serum albumin levels before consuming the Supplementary Feeding of Rebon-based Koya Powder in the Intervention Group were 3.527 ± 0.4183 and after 3.753 ± 0.4642. The mean hemoglobin level before consuming the Supplementary Feeding of Rebon-Shrimp Based Koya Powder in the Intervention Group were 3.527 ± 0.4183 and after 3.753 ± 0.4642. The mean hemoglobin level before consuming the Supplementary Feeding of Rebon-based Koya Shrimp in the Intervention Group was 10,453 ± 1,8189 and after 11,107 ± 1,7015.

2. The mean serum protein level before the intervention in the control group was 7,113 ± 1,1904 and after
that was 6,427 ± 0.9677. The mean serum albumin level before intervention in the control group was 3.580 ± 0.3075 and after 3.600 ± 0.4175. The mean hemoglobin level before the intervention in the control group was 11,513 ± 1.1575 and after it was 11,073 ± 1.1094.

3. There were significant differences in serum protein levels before and after Consuming Supplementary Feeding of Rebon Shrimp-Based Koya Powder in the intervention group with a significant value of P 0.003 <0.05. There were significant differences in serum albumin levels before and after consuming the Supplementary Feeding of Rebon-based Koya Shrimp in the Intervention Group with a significant value of P 0.003 <0.05. There is a significant difference in hemoglobin levels before and after consuming the Supplementary Feeding of Rebon Shrimp-based Koya Powder in the intervention group with a significant value of P 0.002 <0.05

4. There was a significant difference in serum protein levels before and after the intervention in the control group with a significant value of P 0.003 <0.05. There was no significant difference in serum albumin levels before and after intervention in the control group with a significant value of P 0.767 >0.05. There is a significant difference in hemoglobin levels before and after the intervention in the control group with a significant value of P 0.002 <0.05

5. There was a significant difference between the Control and Intervention Groups with a significant value of P 0.000 <0.05

Ethical Clearance: Taken from Poltekkes Kemenkes Sorong ethical committee

Source of Funding: Poltekkes Kemenkes Sorong

Conflict of Interest: Nil

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Risk Factors Related to the Events of Leprosy in Children age 5-14 Years in City of Sorong West Papua

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Abstract

Leprosy is an infectious disease which is a national public health problem, because several regions in Indonesia have a high prevalence rate. There were 17,012 new cases of leprosy in Indonesia in 2010, consisting of 13,734 cases of Multi Basiler and 3,278 cases of PausiBasiler with a Newly Case Detection Rate (NCDR) of 7.22 per 100,000 population. The number was recorded as many as 20,329 cases with a prevalence of 0.86 per 10,000 population.

In Indonesia, there are 12 provinces that still have leprosy rates above one person per 10,000 population, including the Province of Nangro Aceh Darussalam (1.51), South Kalimantan (1.07), East Java (1.67), North Sulawesi (2.57), Central Sulawesi (1.17), South Sulawesi (2.02), Southeast Sulawesi (1.21), Gorontalo (3.62), NTT (1.17), North Maluku (9.51), Maluku (3.47), and Papua (4.62).

This study aims to see the risk factors for leprosy in children aged 5-14 years in Sorong City, West Papua Province. This type of research is a case control study and the population is children 5-14 years old in Sorong City with a sample of 54 respondents. The research data were analyzed using SPSS 16. Data analysis used the Chi-Square test.

The results showed that the socioeconomic level p (0.000) < sig (0.05) and (OR) = 13.600 (> 1 = risk risk) history of home contact p (0.000) < sig (0.05) and the odd ratio value (OR) = 35,714 (> 1 = risk risk) associated with the incidence of leprosy in children aged 5-14 years in Sorong City, while education p (0.569)> sig (0.05), parent’s occupation p (0.766)> sig (0, 05), personal hygiene p (0.136)> sig (0.05) is not a risk factor for the incidence of leprosy in children in Sorong City.

It is recommended that parents increase knowledge about leprosy transmission by seeking information from both health workers and the mass media, as well as the public who can actively participate in supporting government programs and efforts to prevent leprosy.

Keywords: Risk Factors, Leprosy in Children, West Papua.

Introduction

Leprosy or also known as leprosy is a chronic disease caused by Mycobacterium leprae. This disease is still a health problem in some developing countries.

Leprosy is a chronic disease that attacks nerves edges, skin and other body tissues and can cause permanent disability. Leprosy is a chronic disease that attacks nerves edges, skin and other body tissues and can cause permanent disability.

According to the World Health Organizations (WHO), leprosy is classified into 2, namely: type PB (Pausibacillary) and type MB (multi bacillary). As of March 2013, there were 189,018 cases recorded, and the number of new cases in 2012 was 232,857 cases. There were 17,012 new cases of leprosy in Indonesia in 2010,
consisting of 13,734 cases of Multi Basiler and 3,278 cases of PausiBasiler with a Newly Case Detection Rate (NCDR) of 7.22 per 100,000 population. The number of registered cases was 20,329 cases with a prevalence of 0.86 per 10,000 population.4.

There are 12 provinces in Indonesia that still have leprosy rates above one person per 10,000 population. These provinces are NAD (1.51), South Kalimantan (1.07), East Java (1.67), North Sulawesi (2.57), Central Sulawesi (1.17), South Sulawesi (2.02), Southeast Sulawesi (1.21), Gorontalo (3.62), NTT (1.17), North Maluku (9.51), Maluku (3.47), and Papua (4.62) 2.

The indicators used in leprosy are the proportion of MB leprosy and the proportion of children with leprosy (less than 14 years) among new sufferers, which shows the main source and level of transmission in the community.

Provinces with the highest proportion of MB leprosy in 2015 were Bengkulu, Central Kalimantan (100%), Lampung (94.34%) and Gorontalo (91.03%). Meanwhile, the proportion of children leprosy in the same period is around 10% - 12%. Provinces with the highest proportion of leprosy in children are West Papua (30.82), Papua (23.62%), and North Maluku (19.49%) 6.

The proportion of children aged less than 14 years who suffer from leprosy is one of the indicators of the success of the leprosy eradication program, where this figure can be used to see the current state of transmission and estimate the need for medicine. Based on these problems, researchers are interested in knowing the risk factors associated with the incidence of leprosy in children aged 5-14 years in Sorong City, West Papua Province.

**Subjects and Method**

**Types of Research:** The type of research used is an analytical study with a case control study approach. To determine the estimation of the size of the risk factors for disease incidence, it is determined using the Odds ratio (OR) value.

**Research Sites:** This research was conducted in the City of Sorong, West Papua in October - November 2017.

**Sample:** From the study population selected as the sample of this study with the following inclusion and exclusion criteria15,16.

**Research Results**

1. **Overview of the Research Location:** Sorong City is an integral part of the province of West Papua which consists of 8 districts and 1 city. The city of Sorong is located below the equator, between 1310-51 east longitude and 00-54 south latitude. The city of Sorong has an area of 1,105 km2 with geographic boundaries as follows:
   a. The west is bordered by the Dampir Strait, Raja Ampat Regency
   b. In the north, it is bordered by Makbon District, Sorong Regency and Sagawin Strait, Raja Ampat Regency
   c. In the east, it is bordered by Makbon District, Sorong Regency and
   d. In the south, it is bordered by Aimas District and Salawati District, Sorong Regency

Which administratively is divided into 6 districts and 31 sub-districts 2011 data on the condition of health workers in the city of Sorong for labor84 Doctors and 168 Paramedics (nurses, pharmacists, midwives, nutritionists, and others). Sorong City Health Facilities and Infrastructure for Government Hospitals 1 and Private Hospitals 5, Puskesmas 6, Puskesmas Assist 29, and Medical Centers 5.1

**Univariate Analysis:** Univariate analysis is analyzing the data to be tested, namely each independent variable and dependent variable then distributed into a frequency distribution table. The specific data are as follows:

1. Frequency distribution of respondents based on gender (table 4.1). Based on these data, it is known that of the 54 respondents the most were male, namely 35 people (64.8%) while women were 19 people (35.2%).
2. Frequency distribution based on the age of the respondents (table 4.2). Based on table 4.2, it can be seen that the frequency distribution of respondents is known that of the 54 respondents, the maximum age was 10-14 years, namely 34 people (63.0%), while the ages of 5-9 years were 20 people (37.0%).
3. Distribution of respondents based on the level of education of parents (table 4.3).
Based on table 4.3, it can be seen that the frequency distribution of respondents based on the education of the parents of 54 respondents is mostly elementary, junior high school, namely 35 people (64.8%), while SMA, PT is 19 people (35.2%).

4. Distribution of respondents based on the Socio-Economic Status of People (table 4.4) Based on the economy of the parents of 54 respondents, the most were <UMP Sorong, namely 34 people (63.0%) while> UMP Sorong was 20 people (37.0%).

5. Distribution of respondents based on parents’ occupation (table 4.5) Based on the work of parents, it is known that of the 54 respondents, at most> 8 hours a day, namely 38 people (70.4%) while <8 hours a day, namely 16 people (29.6%).

6. Distribution of respondents based on Personal Hygiene (table 4.6) Based on personal hygiene, from 54 respondents the most bad was 38 people (70.4%) while good ones were 16 people (29.6%).

7. Distribution of respondents based on household contacts (table 4.7) Based on table 4.7, it can be seen that the frequency distribution of respondents is known that of the 54 respondents at most there were household contacts, 32 people (59.3%) while there were no household contacts, namely 22 people (40.7%).

8. Distribution of respondents based on the incidence of cases (table 4.8) Based on table 4.8, it is known that the frequency distribution of respondents based on the incidence of leprosy from 54 case group respondents is 27 people (50.0%) while the control group is 27 people (50.0%).

**Bivariate analysis:** Bivariate analysis was carried out to determine the relationship between each independent and dependent variable to see the relationship between the independent variable and the dependent variable.

1. **Sex relationship with the incidence of leprosy in Sorong City, West Papua:** Chi-square test results obtained p value (1.000)> sig (0.05) so that Ho is accepted. This means that it can be known, but because the value of the odds ratio (OR) = 1.176 (> 1 = risk), this means that male respondents have 1,176 times the risk of getting leprosy compared to female respondents.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Incidence of Leprosy</th>
<th>P Value</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N Case</td>
<td>%</td>
<td>N Control</td>
</tr>
<tr>
<td>Man</td>
<td>18</td>
<td>51,4</td>
<td>17</td>
</tr>
<tr>
<td>Woman</td>
<td>9</td>
<td>47,4</td>
<td>10</td>
</tr>
<tr>
<td>Amount</td>
<td>27</td>
<td>50</td>
<td>27</td>
</tr>
</tbody>
</table>

2. **Relationship between Age and the Incidence of Leprosy in Children:** The results of the chi-square test obtained p value (0.788)> sig (0.05) so that Ho was accepted. This means that it can be seen that there is no relationship between age and the incidence of leprosy. The odds ratio (OR) = 1.375 (> 1 = risky), this means that respondents aged 5-9 years have a 1.375 times risk of getting leprosy compared to respondents aged 10-14 years.

<table>
<thead>
<tr>
<th>Age (Year)</th>
<th>Incidence of Leprosy</th>
<th>P Value</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N Case</td>
<td>%</td>
<td>N Control</td>
</tr>
<tr>
<td>5-9</td>
<td>11</td>
<td>55,0</td>
<td>9</td>
</tr>
<tr>
<td>10-14</td>
<td>16</td>
<td>47,1</td>
<td>18</td>
</tr>
<tr>
<td>Amount</td>
<td>27</td>
<td>50</td>
<td>27</td>
</tr>
</tbody>
</table>
3. The relationship between the socioeconomic level of parents and the incidence of leprosy: Chi-square test results obtained p value (0.000) < sig (0.05) so that Ho is rejected. This means that it can be seen that there is a relationship between the economy of the parents and the incidence of leprosy. The odds ratio (OR) = 13.600 (> 1 = risky), this means that respondents with the economic status of the parents < UMP Sorong have a risk of 13.600 times for getting leprosy compared to respondents with the economic status of parents ≥ UMP Sorong.

<table>
<thead>
<tr>
<th>Parents economy</th>
<th>Incidence of Leprosy</th>
<th>P Value</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N Case</td>
<td>%</td>
<td>N Control</td>
</tr>
<tr>
<td>&lt; UMP Sorong</td>
<td>24</td>
<td>70.6</td>
<td>10</td>
</tr>
<tr>
<td>≥ UMP Sorong</td>
<td>3</td>
<td>15.0</td>
<td>17</td>
</tr>
<tr>
<td>Amount</td>
<td>27</td>
<td>50</td>
<td>27</td>
</tr>
</tbody>
</table>

4. The relationship between education of the respondents’ parents and the incidence of leprosy: Chi-square test results obtained p value (0.569) > sig (0.05) so that Ho is accepted. This means that it can be seen that there is no relationship between parental education and the incidence of leprosy. Odd ratio (OR) = 1.633 (> 1 = risky), this means that respondents with elementary, junior high school parents’ education have a 1.633 times risk of getting leprosy compared to respondents with high school parent education, PT.

5. The relationship between personal hygiene of respondents and the incidence of leprosy: The results of the chi-square test obtained p value (0.136) > sig (0.05) so that Ho was accepted. This means that it can be seen that there is no relationship between personal hygiene and the incidence of leprosy. Odd ratio (OR) = 3.025 (> 1 = risky), this means that respondents with poor personal hygiene have 3.025 times the risk of getting leprosy compared to respondents with good personal hygiene.

6. Home contact relationship with leprosy: Chi-square test results obtained p value (0.000) < sig (0.05) so that Ho is rejected. This means that it can be seen that there is a relationship between contact history and the incidence of leprosy. The odd ratio (OR) value = 35,714 (> 1 = risky), this means that respondents with a history of household contacts have a 35,714 times risk of getting leprosy compared to respondents with no history of household contacts.

Discussion

1. The relationship between sex and the incidence of leprosy: Chi-square test results obtained p value (1.000) > sig (0.05) so that Ho is accepted. This means that it can be known, but because the value of the odds ratio (OR) = 1.176 (> 1 = risk), this means that male respondents have 1.176 times the risk of getting leprosy compared to female respondents.

Sex differences in the incidence of leprosy cannot be ascertained, basically leprosy can affect everyone, but men are more affected than women, with a ratio of 2:1, although there are some areas that show more female sufferers. The results of this study are in accordance with the opinion of Marwali Harahap which states that leprosy can attack everyone. Men are more affected than women with a ratio of 2:1.

2. The relationship between the age of the respondents and the incidence of leprosy: The results of the chi-square test obtained p value (0.788) > sig (0.05) so that Ho was accepted. This means that it can be seen that there is no relationship between age and the incidence of leprosy. The odds ratio (OR) = 1.375 (> 1 = risky), this means that respondents aged 5-9 years have a 1.375 times risk of getting leprosy compared to respondents aged 10-14 years.

The incidence of a disease is often related to age. Chronic diseases such as leprosy are known to occur at all ages, ranging from infants to old age (3 weeks to
adults over 70 years). However, most of them are at a young and productive age.

The results of this study are in accordance with the results of research by Maria Christiana\textsuperscript{18} in Jepara Regency which states that there is no relationship between age at risk and the incidence of leprosy.

**The relationship between education and leprosy:**
Chi-square test results obtained p value (0.569)> sig (0.05) so that Ho is accepted. This means that it can be seen that there is no relationship between parental education and the incidence of leprosy. The odd ratio (OR) = 1.633 (> 1 = risky), this means that respondents with primary and junior high school parents have a risk of getting leprosy 1.633 times compared to respondents with high school parent education, PT.

3. **The socio-economic relationship between parents and the incidence of leprosy:**
Chi-square test results obtained p value (0.000) < sig (0.05) so that Ho is rejected. This means that it can be seen that there is a relationship between the economy of the parents and the incidence of leprosy. Odd ratio (OR) = 13.600 (> 1 = risky), this means that respondents with economic status of parents < UMP Sorong have a risk of 13.600 times for getting leprosy compared to respondents with economic status of parents ≥ UMP Sorong.

The results of the research in Makassar City, it is known that the majority of leprosy sufferers are from low economic groups. The weak socioeconomic condition can be a factor that worsens the development of leprosy. Economic status is a significant risk factor for the incidence of leprosy. Respondents with low economic status have a 41,889 times greater risk of suffering from leprosy than respondents with high economic status. The results of this study are in line with research in Tegal and Christiana Districts in Jepara, showing that economic status is statistically significant with the incidence of leprosy.

Economic factors also influence the needs of life, including food and health needs. If the need for healthy food is not met, it can weaken the immune system, so that it is easy to catch a disease if it gets infected. A person does not take advantage of existing health services, perhaps because there is not enough money to buy medicine, pay for transport and so on, this is in accordance with the opinion which states that leprosy occurs in someone, not easy so there is no need to be afraid. This depends on several factors, including socioeconomic conditions\textsuperscript{19-23}.

4. **The relationship between parents’ work and leprosy:**
The results of the chi-square test obtained p value (0.766) > sig (0.05) so that Ho was accepted. This means that it can be seen that there is no relationship between the work of parents and the incidence of leprosy. Odd ratio (OR) = 0.700 (<1 = protective), this means that the work of parents is not too risky with the incidence of leprosy.

<table>
<thead>
<tr>
<th>Job parents</th>
<th>The Incidence of Leprosy</th>
<th>P Value</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N Case</td>
<td>%</td>
<td>N Control</td>
</tr>
<tr>
<td>≥ 8 hours a day</td>
<td>18</td>
<td>47,4</td>
<td>20</td>
</tr>
<tr>
<td>&lt; 8 hours a day</td>
<td>9</td>
<td>56,2</td>
<td>7</td>
</tr>
<tr>
<td>Amount</td>
<td>27</td>
<td>50</td>
<td>27</td>
</tr>
</tbody>
</table>

The statistical test shows that there is a relationship between the type of work and the incidence of leprosy.

This is in line with the research which states that patients with heavy work (66.7%) are more vulnerable than patients with light work (33.8%). Work can be used to analyze any possible risk of developing disease.

5. **The relationship between personal hygiene and the incidence of leprosy:**
The results of the chi-square test obtained p value (0.136) > sig (0.05) so that Ho was accepted. This means that it can be seen that there is no relationship between personal hygiene and the incidence of leprosy. Odd ratio (OR) = 3.025 (>1 = risky), this means that respondents with bad personal hygiene have 3.025 times the risk of getting leprosy compared to respondents with good personal hygiene.
The results of research by Indriani, et al. in the work area of the Kunduran Health Center, Blora, show that there is a relationship between personal hygiene and the incidence of leprosy. It is concluded that respondents who have poor personal hygiene are not necessarily a risk factor for leprosy. Respondents who had bad personal hygiene had a 5,333 times greater risk of getting leprosy than respondents who had good personal hygiene. This shows personal hygiene risk factors associated with leprosy. The results of the research by NisaAmira, et al. show that there is a relationship between body and hair hygiene and the incidence of leprosy in children in Pasuruan in 2014-2015.

### Table 5. Cross tab personal hygiene with The Incidence of Leprosy

<table>
<thead>
<tr>
<th>Personal hygiene</th>
<th>The Incidence of Leprosy</th>
<th></th>
<th></th>
<th></th>
<th>P Value</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N Case</td>
<td>%</td>
<td>N Control</td>
<td>%</td>
<td>N Total</td>
<td>%</td>
</tr>
<tr>
<td>Well</td>
<td>22</td>
<td>57,9</td>
<td>16</td>
<td>42,1</td>
<td>38</td>
<td>100</td>
</tr>
<tr>
<td>Bad</td>
<td>5</td>
<td>31,2</td>
<td>11</td>
<td>68,8</td>
<td>16</td>
<td>100</td>
</tr>
<tr>
<td>Amount</td>
<td>27</td>
<td>50</td>
<td>27</td>
<td>50</td>
<td>54</td>
<td>100</td>
</tr>
</tbody>
</table>

6. **Home contact relationship with leprosy:** Chi-square test results obtained p value (0.000) < sig (0.05) so that Ho is rejected. This means that it can be seen that there is a relationship between contact history and the incidence of leprosy. The odd ratio (OR) value = 35,714 (> 1 = risky), this means that respondents with a history of household contacts have a 35,714 times risk of getting leprosy compared to respondents with no history of household contacts.

### Table 6. Cross tab house contact with The Incidence of Leprosy

<table>
<thead>
<tr>
<th>House Contact</th>
<th>The Incidence of Leprosy</th>
<th></th>
<th></th>
<th></th>
<th>P Value</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N Case</td>
<td>%</td>
<td>N Control</td>
<td>%</td>
<td>N Total</td>
<td>%</td>
</tr>
<tr>
<td>Yes</td>
<td>25</td>
<td>78,1</td>
<td>7</td>
<td>21,9</td>
<td>32</td>
<td>100</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>9,1</td>
<td>20</td>
<td>90,9</td>
<td>22</td>
<td>100</td>
</tr>
<tr>
<td>Amount</td>
<td>27</td>
<td>50</td>
<td>27</td>
<td>50</td>
<td>54</td>
<td>100</td>
</tr>
</tbody>
</table>

The risk of people with a history of household contacts for contracting leprosy is 15,127 times greater than those with no history of household contacts and this is significant. Contact history is a history of a person who has had contact with a person with leprosy, either at home or not at home. The source of leprosy transmission is whole leprosy originating from leprosy sufferers, so leprosy transmission is easier if there is direct contact with leprosy sufferers.

Based on the results of the statistical test, the OR obtained was 15,127 at 95% CI 4,572 - 50,056, meaning that the risk of people with a history of household contacts to contract leprosy was 15,127 times greater than those with no history of household contacts and was significant.

### Research Limitations:

**Limitations in this study include:**
1. Researchers only use 1: 1 small control due to limited costs, time, and energy in data collection
2. Some respondents can only be met at certain hours, so the researcher adjusts the visiting time

**Weaknesses of Research:** In the variable length of contact, only research was conducted on the respondent’s family member who was diagnosed with leprosy. This does not rule out the possibility that the neighbors around the respondents who are also diagnosed with leprosy, especially the multibacillary type who have not received treatment, can become a source of disease transmission.
a. There were some respondents who were embarrassed when they met the officers because this disease was still perceived in the community as a curse disease so that an emotional approach was needed.

**Conclusion**

Based on data analysis from the results of research that has been done in Sorong City, it can be concluded that

1. Parents’ socio-economic factors and a history of household contact are risk factors associated with the incidence of leprosy in children aged 5-14 years in the city of Sorong, West Papua Province.

2. Factors of gender, age, education of respondents, personal hyphenation, work of parents, are not risk factors associated with the incidence of leprosy in children aged 5-14 years in the city of Sorong, West Papua Province.

**Suggestion:**

1. Based on the results of this study, there are several suggestions that researchers can convey, namely: Sorong City Health Office In preventing the occurrence of leprosy both in Sorong City, it is hoped that there will be good cooperation between health agencies, especially in increasing the efforts of the Leprosy Eradication Program.

2. The Community: The results of this study are expected to be used as knowledge about the risk factors for the incidence of leprosy so that people are more aware of the risk factors for the disease, so that it is hoped that they can follow up and participate in efforts to prevent and control leprosy.

3. To further researchers: This research still has many shortcomings, it is hoped that further researchers should add research variables, such as health services, attitudes.

**Ethical Clearance:** Taken from Poltekkes Kemenkes Sorong ethical committee

**Source of Funding:** Poltekkes Kemenkes Sorong

**Conflict of Interest:** Nil

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Effectiveness of the Hatam Language Booklet on Family Knowledge and Attitudes About TB on Children in Warmare District, Manokwari Regency

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Abstract

Lack of public understanding regarding the symptoms of tuberculosis(TB) and its relevance to the risk of getting TB, makes TB cases difficult to detect in Indonesia. Increasing knowledge about TB is an important component of a TB control strategy. Patient and family knowledge will improve prevention behavior and medication adherence. One way to increase knowledge is through promotion or health education. The purpose of this study was to determine the effectiveness of the Hatam language booklet on family knowledge and attitudes about TB in children in Warmare District, Manokwari Regency, West Papua Province. This study used a Quasi Experiment design with Pre-Post test without control group involving 50 families with toddlers who live in Warmare district. Data were collected using a knowledge and attitude questionnaire given before and after education using the Hatam language booklet. Data analysis used the Wilcoxon test. Result, There is a significant difference which indicates that the mean score of knowledge and attitudes before and after the implementation of the Hatam Language Education Booklet has increased by 39.80 and family attitudes have increased by 6.98, the p-value is 0.000 (p <0.05). in conclusion, Health education using booklets and a cultural approach effectively increase public knowledge and attitudes

Keywords: Language Booklet, Family Knowledge, Attitudes About TB.

Introduction

Tuberculosis (TB) is a contagious disease that is transmitted through the air and is one of the top ten causes of death12. The five countries that have the biggest burden of tuberculosis are India, Indonesia, China, the Philippines and Pakistan and there are also challenges that must be faced and become a concern, namely the increasing cases of MDR-TB, TB-HIV, TB with DM, TB in children and other vulnerable communities3.

WHO defines High Burden Countries (HBC) for TB based on three indicators, namely Tuberculosis, Tuberculosis with HIV, TB/MDR. There are 48 countries on the list. One country can be included in one of the lists or all three, Indonesia together with 13 countries, are included in the HBC Indicator for the three categories, which means that Indonesia is experiencing major problems and challenges in facing the TB problem6.

In 2016 an estimated 67 million children with Latent TB, and 70 - 80% suffer from pulmonary TB, and the rest is extrapulmonary TB. Based on the WHO roadmap report to stop TB in children and adolescents in 2018 shows that an estimated 1 million children are infected with TB every year and 233,000 deaths of children aged 0-14 years in 2017, 80% of deaths occur in children under 5 years, 96% do not get treatment services4 and 25,000 children will develop into Multi Drug Resistant TB every year10.

In Indonesia, the proportion of TB cases in children who are notified based on the 2018 Indonesian health profile is 10.08%, one of the TB problems in children in Indonesia is diagnosis, which has been implemented since 2005 as the TB scoring system as a diagnostic approach, which is a problem not all health facilities have Tuberculin Test and Thorax Photo facilities, these two indicators are contained in the scoring system, which cause underdiagnosis of TB in children, another problem is the increasing number of drug-resistant TB cases in adults which is a source of transmission for children 6,3.
Research conducted by Faradis and Indarjo on the implementation of Permenkes number 67 of 2016 policy for tuberculosis control shows that of the 4 indicators in policy implementation and there are 2 indicators that have not been optimally implemented, namely policy resources that have not been fully met and a lack of community support in TB control. Increasing knowledge about TB is an important component of a TB control strategy. Patient and family knowledge will improve prevention behavior and medication adherence. One way to increase knowledge is through promotion or health education. Health education can be delivered in various health media, both electronic and non-electronic, one of the media that is often used because it is interesting and simple is made in the form of a pocket book or booklet.

Based on data from the Eradication and Prevention of Infectious Diseases, West Papua Province, the total number of TB cases treated and reported in 2018 was 2180 cases and especially in Manokwari district itself, amounting to 798 cases of which Warmare District is an area of Manokwari Regency.

Materials and Method

The research design used a Quasi Experiment with Pre-Post test without control Group which looked for the effectiveness or influence between variables, namely the Effectiveness of Hatam Language Booklets on Family Knowledge and Attitudes about TB in Children in Warmare District, Manokwari Regency, where knowledge and attitudes were measured before and after education was given. This research was conducted from October to November. Respondents were given a pre-test questionnaire to assess knowledge of pulmonary tuberculosis. Then the intervention was carried out to provide education using hatam language booklet which was also given to the respondent and after being given the intervention, a measurement was carried out to determine the respondent’s knowledge and attitude. The number of respondents involved in the study amounted to 50 people. Before the data analysis was carried out, the data normality test was carried out with the data normality test that will be used in this study is the SaphiroWilk test because the sample size was 50 respondents and the results of the data normality test showed p value <0.05 so it can be concluded that the data distribution was not normal. differences in knowledge and attitudes before and after the intervention using the Wilcoxon Test.

Results

This study involved 50 respondents who are families who have children under five and there are family members who suffer from tuberculosis.

a. Respondent Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>(Min-Max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondents Age</td>
<td>50</td>
<td>37.42</td>
<td>8.64</td>
<td>20-55</td>
</tr>
</tbody>
</table>

The mean age of the respondents was 37.42 years with an age variation of 8.64 years. The youngest age of the respondents was 20 years and the oldest was 55 years.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Female</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pekerjaan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>No Occupation</td>
<td>43</td>
<td>86</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

100% of respondents are female and those who have occupation are 7 (14%) respondents and No occupation are 43 (86%) of respondents.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic</td>
<td>37</td>
<td>74</td>
</tr>
<tr>
<td>Middle</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>High</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

It shows that some respondents with basic education level were 37 people (37%), Middle education was 5 people (10%), higher education was 5 people (16%).
b. Knowledge and attitude before and after the implementation of Education the Hatam language booklet

Table 4. Analysis of Respondents’ Knowledge and Attitudes Before the Implementation of the Hatam Language Booklet

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Min-Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>50.80</td>
<td>14.18</td>
<td>30-80</td>
</tr>
<tr>
<td>Attitudes</td>
<td>26.94</td>
<td>22.00</td>
<td>22.32</td>
</tr>
</tbody>
</table>

Indicates that the mean score of knowledge before the implementation of education was 50.80 while the mean score for attitude was 26.94

c. Analysis Bivariate:

Table 5. Analysis of Respondents’ Knowledge and Attitudes After the Implementation of the Hatam Language Booklet

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Min-Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>90.60</td>
<td>6.51</td>
<td>80 - 100</td>
</tr>
<tr>
<td>Attitudes</td>
<td>33.92</td>
<td>2.23</td>
<td>27 - 38</td>
</tr>
</tbody>
</table>

The mean score of knowledge after the implementation of education was 90.60 while the mean score for attitude was 33.92

Table 6. Analysis of differences in Knowledge and Attitudes Before and After the Implementation of the Hatam Language Booklet

<table>
<thead>
<tr>
<th>Variable</th>
<th>Measurement</th>
<th>n</th>
<th>Mean</th>
<th>Enhancement</th>
<th>SD</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Before</td>
<td>50</td>
<td>50.80</td>
<td>39.80</td>
<td>14.18</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>After</td>
<td>50</td>
<td>90.60</td>
<td></td>
<td>6.51</td>
<td></td>
</tr>
<tr>
<td>Attitudes</td>
<td>Before</td>
<td>50</td>
<td>26.94</td>
<td>6.98</td>
<td>2.23</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>After</td>
<td>50</td>
<td>33.92</td>
<td></td>
<td>2.22</td>
<td></td>
</tr>
</tbody>
</table>

The mean score of knowledge before and after the implementation of the Hatam Language Education Booklet has increased by 39.80 and family attitudes have increased by 6.98. The results of further analysis obtained the p-value of 0.000, which means that there is a significant difference in the average score of family knowledge and attitudes before and after being given the Hatam language education booklet.

Discussion

Characteristics of respondents in this study include age, gender, occupation and education. Respondents in this study were families who have toddlers and one of their family members was diagnosed with positive pulmonary tuberculosis with an age between 20 to 55 years, all respondents were women and most of them did not have occupation, the respondents had the most education level with basic education level and the lowest with the lowest level of education. middle education.

Differences in knowledge and attitudes of families before and after the application of the Education Booklet. Knowledge

Based on the results of the statistical test, it shows that there is a significant increase in the mean score of knowledge before and after education. One of the efforts to deal with pulmonary tuberculosis is health promotion to increase public knowledge using various method, health education through the media, because the media makes it easier to receive health messages for the public or people with pulmonary tuberculosis.

This research is in accordance with other research conducted on the island of Madura by using a pictorial pocket book in Madura language which shows an increase in knowledge for patients with pulmonary tuberculosis and supervisors taking medication. Another study was also carried out in nine cities in India by Hudart et al which assessed how knowledge about tuberculosis and preventive behavior during Tuberculosis treatment, the results of the study were that knowledge, education, and equality of language used increase knowledge and adherence to preventive behavior. infection.

In general, knowledge and attitudes regarding Tuberculosis vary across countries from an understanding
of the causes of infection to the belief that it is the evil eye, and from a supportive viewpoint of stigma against the disease and patients. Adequate knowledge and positive attitudes about tuberculosis patients greatly contribute to improving health service seeking behavior. Knowledge, individual attitudes of the family and society depend on the actualized patterns of the family, the level of individual maturity and development, the knowledge obtained, the health and culture of the local community. Researchers argue that by taking a cultural approach by providing education and information about pulmonary tuberculosis in children can increase knowledge and positive attitudes and medication adherence to patients.

**Attitudes:** Based on the results of the statistical test, it shows that there is a significant increase in the mean score of attitudes before and after education. Attitude is a mental and neural condition, which is obtained from experiences that direct and dynamically influence individual responses to all related objects and situations, attitudes have cognitive, affective, and conative components. In Ethiopia shows the importance of health education interventions to increase knowledge and awareness and positive attitudes to prevent and control tuberculosis. The positive or negative attitude of society towards Tuberculosis is shaped by educational, knowledge and social status. According to the researchers’ assumptions, a positive attitude is formed from good knowledge and to be able to use method or ways to provide education is important to increase knowledge and attitudes about Tuberculosis.

**Conclusion**

1. Respondents in this study were families who have children under five and family members diagnosed with tuberculosis with an average age of 37.42, the lowest was 20 years and the highest was 50 years. Respondents have the highest level of education with basic education level and the lowest with secondary education, all respondents are female and most of them do not work.

2. The family knowledge and attitudes score was lower before the implementation of the Hatam language book when compared to after the implementation of Education

**Ethical Clearance:** Taken from Poltekkes Kemenkes Sorong ethical committee

**Source of Funding:** Poltekkes Kemenkes Sorong

**Conflict of Interest:** Nil

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Political Commitment of Local Government in Handling Stunting During the Covid-19 Pandemic: A Case Study of Enrekang District

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Abstract

Purpose: This study aims to determine the political commitment of the Enrekang District Government in overcoming the problem of stunting during the COVID-19 period.

Method: This study uses a qualitative research method with a type of case study research. This research was conducted in Enrekang District in May - July 2020. The informants in this study were 13 people who were selected by purposive sampling technique. Data collection was carried out by in-depth interviews, document review, and observation.

Results: The results of this study indicate that the COVID-19 pandemic has an impact on the political commitment of the Enrekang local government in handling stunting. The enactment of Large Scale Social Restriction (LSSR) and refocusing on the budget caused several programs to experience budget cuts. On the other hand, the provision of latrines for sanitation and hygiene absorbs the largest amount of funds.

Conclusions: The COVID-19 pandemic has an impact on the political commitment to handling stunting due to the enactment of Large Scale Social Restriction (LSSR) and budget refocusing.

Keywords: Political commitment, stunting, COVID-19, enrekang district.

Introduction

The problem of stunting is no less important than Covid-19. Stunting is when a child has a low height for their age, usually due to malnutrition, repeated infections, and/or poor social stimulation. The World Health Organization categorizes children who are stunted as those whose height is lower than average for their age, and at least two standard deviations below the WHO’s Child Growth Standards Median.¹ In addition to affecting the golden age of growth, the impact of stunting is expected to continue into adulthood. Currently, globally there are still 149 million children under the age of 5 who suffer from stunting.² In Indonesia, more than 2 million children suffer from malnutrition and more than 7 million children in under 5 years of age are stunted.³ This condition requires political commitment from the central and local governments to show seriousness in food and nutrition interventions in their policy agendas. Lack of political commitment has been identified as the main reason for the low priority received by food and nutrition interventions.⁴

As the COVID-19 coronavirus pandemic begins to spread across the world, many countries including Indonesia have restricted movement as a way to slow the spread of the virus and give their health systems...
more time to prepare for the influx of patients. Indonesia chooses Large-Scale Social Restrictions (LSSR) to prevent transmission of COVID-19. However, countermeasures for COVID-19 such as self-isolation, and social distancing can lead to poor management of key risk factors such as unhealthy diet and physical activity, and limited access to preventive care in primary care settings.

Also, economic instability, limited travel, and access to health care services delay vaccination schedules, and the closure of educational facilities further exacerbates the poor health conditions for children, especially in low and middle income countries. The main sectors that are at risk of collapse or reduced efficiency after COVID-19 include food systems, income and social protection, services health care for women and children, as well as services and access to clean water and sanitation. Moreover, the refocusing of the budget, including programs to reduce stunting, led to a reduction in the budget for various stunting management activities in stunting-prone areas. This could have an impact on the performance of officers and cadres in dealing with stunting.

This study uses qualitative research on political commitment in handling stunting during the COVID-19 epidemic.

This study aims to determine the political commitment of the Enrekang District Government in overcoming the problem of stunting during the COVID-19 period.

Study design: A qualitative methodology was used to explore the political commitment of local governments in handling stunting before and during the Covid-19 pandemic. The design is flexible and approves of the exploration and understanding of meanings that some individuals or groups of people perceive as stemming from social or humanitarian problems.

Instrument Development: The development of an instrument based on the main literature review on political commitment and a national strategy for reducing stunting in Indonesia (NTAPR), then developed a semi-structured interview guide. This guide focuses on the components of political commitment to policies and programs, the size of the budget, and operational/implementation commitments for stunting in Enrekang District. These guidelines were subjected to validation and reliability assessments before data collection. Cumulative validation is used as a cross-reference method whereby researchers use accessible literature to match findings. Based on the nature of the data and the availability of resources, this study followed a cumulative validation process, in which the cross-reference method was combined between the available literature and findings. The reliability of the study was guaranteed by keeping records of the face-to-face interviews of the research informants. This guide was piloted in a local government agency, then modified as needed before being used for research.

Study setting: The research was conducted in the rural area of Enrekang Regency, South Sulawesi Province, Indonesia. Enrekang District is the highest stunting area in South Sulawesi province with around 43.7% in 2019 and is in the category of 100 priority districts/cities for stunting in Indonesia.

Informants and inclusion criteria: The research informants were selected based on the purposive sampling technique. The criteria for informants in the study were people or officials within the scope of the Enrekang District government who had the authority and were directly involved in making policies related to the handling of stunting problems, and those who were directly involved in implementing stunting handling activities. A total of 13 informants were selected, namely 3 key informants, 2 expert informants, and 8 other informants ($n = 13$).

Sampling, data collection, and processing: Informants were selected using a purposive sampling method, based on presumptions about the required sample characteristics. Each interview lasts 30 to 45 minutes. Research questions were raised and informants were given the freedom to express additional views and comments. All interviews were audio-recorded and the principal investigator took additional field notes. The accuracy and consistency of the interviews were verified by listening to the recordings. The first author analyzes the transcript line by line, which is read repeatedly and then analyzed thematically for its content. Research co-authors verified the themes and content that emerged.

Results

The political commitment of the Regional Government of Enrekang District to handling the stunting program before and after Covid-19, based on the results of this study includes three dimensions, namely institutional commitment (policies and programs),
budget commitment, and operational/implementation commitment, as described below.

1. Institutional Commitment:

a. Conditions before COVID-19: Stunting activities have been adopted into the Regional Medium Term Development Plan (RMTDP) according to the vision and mission of the elected regents and deputy regents for the 2018-2023 period, as recognized by the following key informants:

“... from the vision and mission of the elected Regent and Deputy, it has been adopted into the RMTDP where the issue of stunting is a priority for Enrekang Regency ... because it has become an indicator in the RMTDP ... starting in 2018 ... because the issue of stunting at that time has become a national issue”, Deputy Regent of Enrekang) - KI-1

In addition to specific stunting activities, stunting-related activities have also been adopted into regional development planning documents, this is because stunting reduction is a cross-sectoral activity, as explained by the following informants:

“... Stunting activities have been adopted into the 5-year development planning document... in the form of cross-sectoral activities... stunting prevention has become a priority in Enrekang Regency. ... ”(RH, 34 Years, Chairman of Commission III DPRD Enrekang) - KI-2

“... stunting issues are the main performance indicator for Enrekang District ... stunting is also a national program ... and Enrekang is designated as a stunting locus ...” (RD, 48 years old, Secretary of Regional Development Agency) - KI-3

Stunting activities and indicators have also been adopted into the Strategic Plan, including the Health Office and the Food Security Service, as shown in the following interview:

“... in the Health Office strategic plan there are already special activities for stunting ...” ... in the form of maternal and child health, malnutrition, immunization, exclusive breastfeeding, health promotion, clean water and sanitation ... “(ST, 53 Years, Head of Health Service) - KI-4

“... in the 2018-2023 official strategic plan, food security has adopted activities that support the acceleration of stunting reduction ... as a performance indicator of the prevalence of food consumption sufficiency and the proportion of the population with a minimum calorie intake below 1,400 kcal/capita/day ... ”, (SY, 55 Years, Head of Food Security Service) - KI-5

Enforcement of Large-Scale Social Restrictions (LSSR) such as school and work vacations; restrictions on activities in public places or facilities; restrictions on transportation modes, have an impact on handling stunting during the COVID-19 pandemic due to self-isolation, and social distancing. This has resulted in inadequate health services. For example, the Integrated Service Post and Community Health Center services, as explained by the following expert informant (EI).

“... considering that Posyandu is no longer operating and health workers at the Puskesmas are not spared the impact of COVID-19. This situation causes the monitoring of children’s development and development activities to stop early in life”. (EI-1; EI-2)

Economically, PSBB has an impact on job losses and reduced income, which causes a decrease in people’s purchasing power for nutritious food, and increases in poverty. Review the following expert informants.

“On the production side, transportation, storage and sale of food are also disrupted. As a result, nutrition problems in vulnerable groups such as pregnant women and toddlers will increase along with the difficulty of their access to nutritious food.” (EI-2)

“Pregnant women and children under five will experience problems in health and nutrition services, which are essentially stopped by limited access due to the focus of services for Covid-19” (EI-3)

2. Budget Commitment: Refocusing (reallocation and cutting) of the budget of the Enrekang District Government can affect stunting management activities, especially during the COVID-19 pandemic.

a. Reallocation of specific activities for stunting due to Covid-19: Based on the Regulation of the Regent of Enrekang Number 26 of 2020 concerning the Elaboration of Amendments to the District Regional Revenue and Expenditure Budget (RREB). In 2020, data on changes to the budget for special stunting activities are obtained in 4 Regional Apparatus Organizations (RAO) as seen in Table 1,
Table 1. Reallocation of Specific Activities Budget for Stunting due to COVID-19

<table>
<thead>
<tr>
<th>Institutions</th>
<th>Name of Activities</th>
<th>Basic budget (IDR)</th>
<th>After change (IDR)</th>
<th>Difference (IDR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Health Office</td>
<td>Specific nutritional interventions for stunting management</td>
<td>70,000,000</td>
<td>20,425,000</td>
<td>49,575,000</td>
</tr>
<tr>
<td>Regional Planning Agency</td>
<td>Coordination of Stunting Regional Action Plan (RAD)</td>
<td>145,600,000</td>
<td>117,236,750</td>
<td>28,363,250</td>
</tr>
<tr>
<td>Social services</td>
<td>Monitoring Providing assistance to fulfill stunting nutrition</td>
<td>30,000,000</td>
<td>0</td>
<td>30,000,000</td>
</tr>
<tr>
<td>Office of population control and family planning</td>
<td>Socialization of stunting prevention in children in the first 1000 days of life</td>
<td>30,000,000</td>
<td>6,249,000</td>
<td>23,751,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>275,600,000</strong></td>
<td><strong>143,910,750</strong></td>
<td><strong>131,689,250</strong></td>
</tr>
</tbody>
</table>

“There was a reduction in the budget related to specific stunting activities by an average of 47.8% spread across 4 RAOs. The budget for special stunting activities in the 2020 Regional Revenue and Expenditure Budget (RREB) main budget is IDR. 275,6 billion, reduced by IDR 131,7 billion so that the remaining budget is IDR 143,9 billion. (NM, 41Th, Head of Regional Financial Management Agency) - I-3

b. Reallocation of the budget for stunting support activities: Refocusing (reallocation and reduction) of stunting support activity budgets sourced from the Special Allocation Fund (Health Operational Costs), is presented in Table 2.

Table 2. Budget reallocation for Stunting support activities (before and during COVID-19)

<table>
<thead>
<tr>
<th>No.</th>
<th>Institutions</th>
<th>Basic Budget (IDR)</th>
<th>After the change (IDR)</th>
<th>Difference (IDR)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>The years 2020</td>
<td>The years 2020</td>
<td>The years 2020</td>
</tr>
<tr>
<td>Public Health Office</td>
<td>9 activities with reduced budget such as maternal and child health services, the development of promotional media and information on healthy living awareness</td>
<td>18,628,854,364</td>
<td>18,305,346,346</td>
<td>(-323,508,000)</td>
</tr>
<tr>
<td>1</td>
<td>5 fixed budget activities, such as National Health Insurance (NHI), procurement of medical equipment.</td>
<td>17,466,738,990</td>
<td>17,466,738,990</td>
<td>0</td>
</tr>
<tr>
<td>Food security service</td>
<td>Implementation of nutrition and food precautions</td>
<td>23,000,000</td>
<td>11,500,000</td>
<td>(-11,500,000)</td>
</tr>
<tr>
<td>2</td>
<td>Utilization yards through the development of the best-selling food house area (BSFHA)</td>
<td>64,860,000</td>
<td>41,368,350</td>
<td>(-23,491,650)</td>
</tr>
<tr>
<td>Social Services</td>
<td>Coordination of mentoring, and empowerment monitoring of the Family Hope Program (FHP)</td>
<td>170,300,000</td>
<td>73,050,000</td>
<td>(-97,250,000)</td>
</tr>
<tr>
<td>3</td>
<td>Community Sanitation (latrine procurement)</td>
<td>2,337,500,000</td>
<td>3,177,828,000</td>
<td>840,328,000</td>
</tr>
</tbody>
</table>

There were 18 supporting activities for stunting, 12 activities experienced a reduction in funds, 5 activities did not change the budget, the remaining 1 activity actually increased the budget, namely the provision of latrines, as explained by the following informant.
“... out of 18 activities supporting stunting, 12 of them experienced a budget decline of IDR 457 billion (2.4%). There are 5 activities whose budgets are fixed.

There is 1 activity that has experienced a significant increase in the budget, namely the community sanitation program (provision of latrines) at the Housing, Settlement and Spatial Planning Agency from IDR 2.3 trillion to Rp. 3.2 trillion, an increase of IDR 840 thousand (35.9%). (NM, 41 Years, Head of BPKAD) – KI– 6)

c. Operational Commitment/Activity Implementation: Stunting policies and programs (before and after COVID-19) can be seen in Annex 1 Table 3. Based on the results of in-depth interviews with several informants, it was stated that the COVID-19 pandemic required adjustment of activities based on health protocols in the form of physical distancing.

“....Several cross-sectoral activities, such as stunting deliberations, coaching and mentoring, including monitoring in the locus village, were still implemented but limited the number of participants. Even the training of stunting holders in the district was abolished due to budget reduction” (I-10; --------)

Planning before and after COVID-19 took place, several stunting management program activities did not change but participants were limited according to health protocols. In addition, there was a reduction in incentives for Community Empowerment Cadres (CEC) as a result of refocusing the APBD so that it was estimated that they could reduce their performance. Training for stunting program holders at the district and health center levels was apparently omitted.

Discussion

The political commitment of the local government of Enrekang District in handling stunting can be discussed in three dimensions including institutional commitment, budget commitment, and operational/implementation commitment of stunting before and during the COVID-19 pandemic.

Institutional Commitment: Institutional commitment is a rhetorical commitment converted into a substantive policy infrastructure including institutions responsible for coordinating action, adoption of enabling legislation, policies and policy instruments commensurate with the severity of the problem and the commitment of mid-level bureaucrats who are responsible for coordinating action.11

The COVID-19 pandemic that has hit the world including Indonesia has had an impact on the handling of stunting in high-risk areas such as Enrekang District where the stunting rate reached 47.5% in 2019.15

The enactment of Large-Scale Social Restrictions (LSSR) which close schools and workplaces, restrictions on social activities and public facilities, restrictions on transportation modes, and even the movement of people from one city to another. This has an impact on decreasing family income, disruption of food stocks, barriers to access to health services.17-18 Increases the risk of all forms of malnutrition, even maternal and child mortality.19 Without adequate intervention, it will interfere with early life nutrition and have the potential to disrupt children’s growth and development and have a lifetime impact on the formation of basic human capital.20 Reduced political commitment has been identified as the main reason for the low priority received by government food and nutrition interventions relative to the high disease burden caused by malnutrition.11

The Village Ministry has taken steps to break the chain of spreading the Coronavirus into the village by holding the Village Cash Workforce Program (VCWP). Workers who are involved in the program will not place too much emphasis on workers’ abilities or skills.

The VCWP program will target workers who come from poor, unemployed, and underemployed families, as well as other members of marginalized communities.

Then, wages for workers will be given daily and in implementing VCWP, they must prioritize health protocols such as physical distancing and others.

Many programs have expanded their targets since the COVID-19 crisis hit. The Sembako Program that was given to 15.2 million people has now received 20 million recipients. The value also increased, from 150 thousand rupiahs to 200 thousand rupiahs.

Besides, the Family Hope Program (FHP), Direct Cash Assistance (DCAT), Pre-Employment Cards, discounted electricity rates, and credit payment relief for the informal sector was launched. The same is done in Ethiopia for food insecurity in the form of the Productive Safety Net Program aimed at providing emergency food assistance to 15 million people who are vulnerable to
food insecurity and are considered important for the narrative of reducing stunting in the country.21

Meanwhile, the Unconditional Cash Transfer (UCT) amount was around $ 42 USD per month for 3 months per beneficiary family. The same was done in Peru22 and the Kyrgyz Republic23, using a successful financial incentive-based model as a means of providing a social safety net to reach marginalized and vulnerable populations.

**Budget Commitment**: The budget commitment in dealing with nutrition problems is public expenditure, for example the percentage of the government budget that is spent on nutrition/food issues.10 Budgetary commitment is an allocation of resources allocated to a specific problem relative to a certain benchmark.11

The impact of COVID-19 has forced the Indonesian government to refocus the health budget, including priority programs for handling stunting in the regions to prevent the spread of COVID-19. The results of this study indicate that the budget refocusing for specific stunting activities in Enrekang District (Appendix 1 Table-1) has an average reduction of 47.8%. Likewise, the budget for stunting support activities in Enrekang District (Attachment 1: Table 2) was reduced by 2.4% for 12 types of activities from 18 activities. In addition, there are 5 activities that do not change the budget which is more tangible as a Special Allocation Fund (SAF) such as the National Health Insurance (NHI), purchasing medical equipment, childbirth insurance, and community-based total sanitation.

But interestingly, from refocusing the stunting support budget, there was a drastic increase in the community sanitation program for latrine provision by 35.9% from IDR 2.3 trillion (US $ 161,207) to IDR 3.2 trillion (US $ 219,161). This illustration shows that refocusing the stunting support budget in Enrekang District is a reallocation of the focus of the community sanitation program for the provision of latrines. Based on the results of in-depth interviews, it was revealed that sanitation is one of the main triggers that contribute to increased stunting.

Yet according to Shekar M, et al. related to the increase in the annual cost scale for the period 2016-2025 which was carried out in 37 countries with a high prevalence of stunting, including Indonesia. The research focuses on a package of specific nutritional interventions that have been shown to be effective. The results of the study indicate that the 10-year budget needed to increase specific nutrition interventions is 49.5 billion dollars, to achieve this target current funding must increase from 2.6 billion to 7.4 billion on average per year. Reaching stunting targets is feasible but will require a large and coordinated investment in a supportive environment.24

**Operational/implementation commitment**: The results of the study revealed that monitoring of nutritional status by Community Empowerment Cadres (CEC) in villages affected by Covid-19 was due to a reduction in the regional government budget, in which the incentives for CEC, especially in remote and difficult to reach villages such as Enrekang District, the role of CEC is very effective in the community health education system as carried out by Ethiopian health extension officers (HEWs)21 exhibit models that are successful in mobilizing community health workers (CHWs; who receive basic and commodity training) to deliver vaccines, nutritional supplements, health and nutrition education, and even reproductive, maternal and newborn care.

What is interesting about the reallocation of the budget for stunting support activities (Appendix 1: Table 2) shows that the Enrekang Regional Government’s attention to the provision of latrines to meet adequate sanitation and hygiene is very important for the agenda for overcoming COVID-19 and other positive health impacts. Beal T et.al, reviewing the determinants of stunting in children in Indonesia, revealed that children from households with poor latrines and untreated drinking water were at higher risk of stunting.26 The commitment of the district government of Enrekang is in line with experiences in several other countries in creating a healthy environment by reducing open defecation and encouraging hygienic practices and has been linked to reducing stunting in Senegal25 and Ethiopia21 focusing on change. the behavior to create a village free of open defecation. These programs spark community desire for collective change by encouraging innovation and context-specific solutions while fostering a sense of community ownership. Community-Led Total Sanitation (CLTS) programs in sample countries such as Nepal have had an important impact on reducing stunting in childhood.

Reducing the budget for the development of promotional media and health education during the COVID-19 pandemic in Enrekang District, when schools and workplaces are closed, can hinder the
Community’s Clean and Healthy Behavior (CCHB) program, and reduce stunting, and prevent the spread of COVID-19. It is better to involve women’s groups and other health communities to communicate the best health practices in rural communities. Several countries, for example in reducing stunting, have demonstrated the potential use and impact of this mechanism on stunting reduction. Learning from their experience with Ebola, the CHW Senegal program has proven to be an effective mechanism for communicating health best practices to the public. The FCHV program in Nepal and the HEW in Ethiopia also have a very successful component of health and nutrition counseling. The Republic of Kyrgyzstan uses women’s support groups in the community as a means of keeping up-to-date with the health situation and sharing knowledge, and adaptable model for accelerating stunting reduction.

The results of in-depth interviews with experts and UNICEF estimates show that in the absence of timely action, the number of children who experience wasting or acute malnutrition under 5 years of age could increase globally by around 15 percent this year due to COVID-19. It is in this context that political commitment Regional and central governments need to rearrange strategies and priorities in handling stunting during the COVID-19 pandemic based on data.

**Conclusion**

The COVID-19 pandemic has an impact on the political commitment to handling stunting due to the enactment of Large Scale Social Restriction (LSSR) and budget refocusing. The low political commitment of the Local Government of Enrekang Regency can be seen from the reduction of incentives for monitoring the nutritional status of Community Empowerment Cadres (CEC), and reducing the budget for developing media for promotion and health education, which have an impact on the weak performance of cadres and health workers. In a situation of COVID-19 village cadres can do double duty to reduce the spread of COVID-19.

On the other hand, the reallocation of the accumulated stunting support budget on the provision of latrines shows a high political commitment to fulfill sanitation and hygiene to support stunting reduction.

**Acknowledgment:** We highly say thank you to the local government of Enrekang Regency who have given a permission to conduct this research.

**Ethical Clearance:** Taken from Hasanuddin University ethical committee.

**Source of Funding:** LP2M Hasanuddin University

**Conflict of Interest:** Nil

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Biomedical Waste: A Review

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Abstract

Bio-medical wastes are produced during the analysis of a patient, during healing process or vaccination to all animals while performing research and induced into humans by the fabrication or checking of biological samples, as per the guidelines in Schedule I, of the BMW rules, 2016 (AIIMS, 2020). The health care workers should be provided with proper guidance for the safe disposal of biomedical wastes. Especially rag workers are more involved in cleaning residential areas where hospitals are nearby. The awareness of mediwastes should be publicized more to the people in order to prevent from serious health hazards. The sources of mediwaste are elaborated in this review and flowcharts make the readers to easily gain knowledge of the sources and details about the category. There is various treatment method practiced in India but still residential clinics and hospitals should strictly abide by the rules and guidelines of World Health Organization (WHO). The precautionary measures and safe disposal of wastes are mentioned in this review focusing and creating awareness to the public.

Keywords: Health care system, biomedical waste, public awareness, treatment plans.

Introduction

Hospital systems play a vital role in producing medical waste. As per guidelines of WHO, states about precautionary measures for the biomedical waste to be disposed in a careful way for a healthy environment. Health care workers should possess an adequate knowledge for safe disposal of the waste. The hazardous and toxic waste materials produced from the hospitals which lead to spread of infections by improper disposal method. The government of India repeatedly believes in waste management by emphasizing the quote Reduce, Recycle and Reuse[1]. The medical waste should be treated initially in an ecofriendly manner rather than handling till the end point[2].

The microbes present in the waste products are easily penetrated inside an individual and causes harms in healthy bodies. The microbes may be a virus, bacteria; fungus, parasitic or even a tested animal waste can cause serious life threatening effects in humans. The safety level should be a serious concern especially in hospital workers and the cleaners which directly or indirectly affects the public[3].

Industrial waste are globally serious concern and been in media as water been contaminated, air is toxic and so many health concerns are in keen report and to the knowledge of public who mostly raises their voices for
industrial wastes but comparatively rather than industrial waste, medical wastes are more prevalent within the residential area and public was not aware of the toxicity and hazards caused by these wastes. Contamination of underground water by medical waste causes diarrhea, cholera, plague, hepatitis and so on[4].

The real challenge of biomedical waste causes immediate health effect compared with the industrial wastes. So, to overcome the effects World Health Organisation (WHO) has published the “Blue Book” in 2014 for the safe disposal of BioMedical waste[2]. Thus our research review focuses on the sources, types and categories, treatment and precautionary measures of the biomedical wastes which are causing hazards to the residential areas affecting the public health.

Sources of Biomedical Waste: Biomedical wastes possess both solid and liquid waste present in local bodies are categorized into primary, secondary and tertiary sources. The primary sources are given in figure 1. The secondary sources are local residential clinics, Ambulance services, close contact with patients, cosmetic clinics, paramedicals. The tertiary are household wastes, home care treatments, Education centers, funeral houses, Transports etc[5].

![Fig. 1: Primary sources of biomedical wastes](image)

Types of Biomedical wastes: The biomedical wastes are categorized into two types as harmful and harmless wastes. The harmless wastes are eco-friendly in nature and can be degraded in short span of time whereas the harmful wastes are classified based on the guidelines of WHO. These wastes are caused by microorganisms are referred as pathogenic wastes, human tissues and organs are categorized as Anatomical waste, mutagenic and carcinogenic chemical wastes such as alkaloids are cytotoxic wastes, heavy metal disinfectants are pharmaceutical wastes, blood and other fluid excretions are liquid wastes, radioactive wastes are radionuclide’s which possess genotoxic effect and used for imaging purposes. Prickly objects are also referred in common as sharps such as needles, broken glassware, glass vials, surgical knifes, capillary blood sample tubes for example blood sugar lancets etc[6].
**Categories of Biomedical waste based on color:** Hospitals can be found with different color of dustbins; now even Chennai corporation vehicles are fitted with different color dustbins. The color indicates in hospitals are yellow, red, blue and black or white. The yellow color wastes indicate for human tissues, organs, placentas at the time of delivery, animal wastes, chemical wastes. Red color indicates for contaminated recyclable waste e.g. Infectious Blood sample bags. Blue color indicates sharp objects like needles, tamper proof containers, punctures, leak proof etc and black or white color indicates for pharmaceutical wastes such as tablets, cardboard boxes.\(^7\)
Overview of Biomedical waste treatment method:

The waste products from these sources are efficiently treated by performing various method. They are

1. **Autoclaving**: Autoclaving is a steam sterilization method in which the infectious pathogens like bacteria, virus, fungi, spores are present in materials like forceps, blades, glassware’s are sterilized at 121°C for 20 minutes which kills harmful pathogens present in that material.

2. **Microwave**: This method is also similar to autoclave uses electromagnetic rays to produce heat and disinfect the materials. The advantage of using microwave in hospital is absence of liquid discharge and considerable volume reduces[10].

3. **Hydroclave**: This method is similar to autoclave but the difference is the vapor that is present inside the jacket and not into the vessel where the biomedical wastes are sterilized and therefore the vapor does not have a direct contact with waste. This facilitates the apparatus to retain the steam inside the boiler[9].

4. **Incineration**: Incineration is one mode of treatment method where high-temperature is produced due to arid corrosion process in which organic and explosive wastes are reduced to form inorganic, in explosive matter. Incineration technology is more useful where medical wastes cannot follow 3R’s (Reduce, Reuse and Recycle)[8].

5. **Pyrolysis**: It is a thermal method in which the biomedical wastes are burnt completely in the absence of oxygen at 800 °F. As a result of decomposition by thermal method the wastes are completely burnt and the result is to produce gases and charcoal.

6. **Encapsulation**: Encapsulation is the process in which the biomedical wastes are coated with inert materials like High-density polyethylene (HDPE) and polybutadiene as these chemicals are stable, stick to the waste, and resist biodegradation[11].

7. **Chemical Disinfectants**: The wastes to be shredded and small pieces of wastes are in direct contact with chemical agents such as mercuric chloride (HgCl₂), sodium hypochlorite (NaOCl), chlorine dioxide (ClO₂), peracetic acid (CH₃CO₃H), glutaraldehyde (C₅H₈O₂), quaternary ammonium compounds and disinfect the hazardous wastes[12].

Precautionary measures[13]:

1. Employees working on biomedical wastes should strictly wear gloves, goggles and masks.
2. Waste materials should be placed in appropriate bins with labels.
3. Treatment method should be strictly followed depending upon the category of biomedical wastes.
4. Segregated materials should be cleaned without any damage and spillages.
5. Sanitizers with 70% alcohol should be in hand to all biomedical waste workers.
6. Prickly objects should be handled with great care by wearing gloves without piercing the objects.
7. Broken materials like glasses, vials are to be cleaned with brooms and tongs.
8. Place contaminated PPE in closable, leak proof bags or containers for disposal or decontamination.
9. Wash hands frequently with soap and water.
10. Take bath after exposing to hazardous materials and get frequent medical attention.

Conclusion

Our review focuses on the manmade biomedical waste and its treatment plan are major demanding issues in the country. The rules & guidelines by Govt. of India should be more strictly followed as a matter of concern. To develop a healthy and environment safe practice each and every citizen should abide the rules and rag workers should be given adequate knowledge and awareness to keep the environment greener. The residents should also have interest in maintaining the hospitals and other laboratories for the safe disposal of biomedical wastes.

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Source of Funding: Meenakshi Academy of Higher Education and Research, Chennai, India

Conflict of Interest: Nil

References


COVID-19: Current Status and Future Strategies to Control the Spread in the State of Tamil Nadu, India

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Abstract

The severe acute respiratory syndrome coronavirus 2 from the family of Coronaviridae is causing coronavirus disease. This is a zoonotic disease and identified first in the Hubei Province of China. In early 2020, this disease was announced as a global pandemic. The pandemic hit the nations undiscriminating their economic and development status. Tamil Nadu, a state of India is one of the most affected in the country. In spite of various precautionary measures in controlling the pandemic, the state recorded active cases of 18,881 as of 13th June 2020. With no defined treatment to cure the disease till date, the healthcare workers along with the collective support of various departments of the state are handling the situation with an aim to end the epidemic. Almost all the sectors such as finance, business, education, etc. were affected by the pandemic. This article discusses the current countermeasures for the infection, the impact on the state and suggests a few strategies to control the spread.

Keywords: SARS-CoV-2, COVID-19, Pandemic, Tamil Nadu, Epidemic, Strategies, Lockdown.

Introduction

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a new strain from the family of Coronaviridae which mainly targets the respiratory system of humans causing coronavirus disease (COVID-19). It was first discovered at the end of the year 2019 when a group of patients were admitted with reports of pneumonia, in the hospitals of Hubei Province of China. This disease is a zoonotic disease which means it is transmissible from animals to humans. This is more similar to earlier reported diseases like Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS). Since it is genetically similar to SARS, it is name named as SARS-CoV-2 on 11th February 2020 by the International Committee on Taxonomy of Viruses (ICTV). The common symptoms of COVID-19 include fever, cough, sputum production, tiredness, anosmia and breathing difficulties[2,5,17]. In serious cases, this can cause pneumonia, kidney failure and even death. The symptoms of the disease appear after 5.2 days of the incubation period[2]. Patients with mild symptoms recover after a week, whereas patients with severe symptom cases due to alveolar damage caused by virus experience progressive respiratory failure leading to death. However, factors such as the patient’s age and immune system have a large impact of China. This disease is a zoonotic disease which means it is transmissible from animals to humans. This is more similar to earlier reported diseases like Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS). Since it is genetically similar to SARS, it is name named as SARS-CoV-2 on 11th February 2020 by the International Committee on Taxonomy of Viruses (ICTV). The common symptoms of COVID-19 include fever, cough, sputum production, tiredness, anosmia and breathing difficulties[2,5,17]. In serious cases, this can cause pneumonia, kidney failure and even death. The symptoms of the disease appear after 5.2 days of the incubation period[2]. Patients with mild symptoms recover after a week, whereas patients with severe symptom cases due to alveolar damage caused by virus experience progressive respiratory failure leading to death. However, factors such as the patient’s age and immune system have a large impact
in recovering from the disease. In case studies, deaths are recorded in middle age and elderly patients with pre-existing diseases. COVID-19 disease has shown an unremitting capacity to infect the population of the world [3]. When the disease outbreak reached almost all the nations within a few weeks with the reported cases of 53,401, WHO declared the disease as a global pandemic on 11th March 2020. As on 13th June 2020, globally there are about 7.8 million COVID-19 active cases causing more than 4 lakhs deaths and 4 million recoveries. The pandemic hit the nations undiscriminating their economic and development status. Industrialized countries like the USA, Italy are not exceptions but the most affected.

The developing country like India is no exception for this global health emergency. The first COVID-19 positive case in India was identified on 30th January 2020 in the state of Kerala. As on June, 13th India ranks 4th worldwide and 1st in Asia for having the largest number of COVID-19 positive patients with active cases of 150,101 out of 55,07,182 samples tested [31]. Tamil Nadu is one of the most affected states in India. In Tamil Nadu, the first case of COVID-19 positive was identified on the 7th of March 2020. As on June 14, according to the Health and Family Welfare Department of the Government of Tamil Nadu, the state has identified 42,687 positive cases out of 691,817 persons tested. Tamil Nadu is at 3rd place in having the largest number of active cases (18,881) and 2nd place in the number of patients recovered (23,409) from the disease. Maharashtra and Delhi are having a greater number of active cases than Tamil Nadu [7]. Of the 38 districts of the state, the state capital Chennai is the most affected with active cases of 30,444 comprising 71% and 316 deaths of the infected patients as on 13th June 2020 [16].

**Control Measures:** COVID-19 is an influenza-like disease that is highly contagious. There is no definite treatment to date available for the treatment of COVID-19. Only supportive therapies available for COVID-19 are antibiotics for infection, mechanical ventilation system, administration of analgesic and antipyretic and maintenance of hydration. Some of the studies claimed that interferon-alpha and ribavirin to be showing synergistic effect in early stages and some studies suggested mycophenolic acid as monotherapy [19]. World Health Organization recommended extracorporeal membrane oxygenation (ECMO) to patients with refractory hypoxemia, treatment with convalescent plasma and immunoglobulin G delivered to the critical condition patients. Remdesivir has been reported to treat the first US case of COVID-19 successfully [13,14]. In order to prevent the transmission, WHO announced various infection prevention and control (IPC) strategies such as to wash the hands frequently using alcohol-based solutions, avoid the touching of nose, eyes, mouth, wearing of face masks, social distancing, use of disinfectants, etc [30]. This was seconded by the government of the state and public awareness through print and electronic media was made.

To decrease the impacts caused by the novel coronavirus and to reduce its transmission, state government along with the central government took various precautionary measures and various activities to control the disease spread. The Indian government has allotted 510 crore rupees to the state of Tamil Nadu to fight against the spread of disease. Earlier in February, Tamil Nadu has allocated 5.7% of its total expenditure on health in the state budget 2020-2021 This accounts for about 17,000 crores rupees which is greater than the average expenditure of 29 states of India. From the announcement of COVID-19 to be a disaster till June 4, the state government has allotted about 4,333 crore rupees. The planning in the state like most other states and nations was subjugated by measures to stop the spread of the virus. Since the identified cases had a travel history of infected nations, restriction on airports and temperature screening of the passengers was made. State government reports that more than 2.2 lakhs people have been screened at the airports. The passenger screening was extended to railway stations, bus stations and many public gathering buildings. And those showing symptoms were treated in hospitals. Humanoid robots are used in hospitals for servicing the infected patients. Followed by COVID-19 diagnosis screening and compulsory quarantine of people coming into the state was advised.

On March 23, the day after the number of positive cases increased to 9, the Government of Tamil Nadu announced state-level lockdown for March 24-31 followed by the announcement of a nation-wide lockdown of 21 days on the next day by the Government of India. This was welcomed by most of the people of the state. Lockdown led to complete closures of the borders, restriction in the inter and intra-state movement, a shutdown of all private and government organizations, public gatherings, etc. To ensure the availability of the essentials to the public, travel between states and inside the sates was exempted for some essential commodities. E-passes were made mandatory for travel within the
state to deliver the essentials and for some emergency situations. At the community level, the government started screening of persons who had come to the state from various infected nations. In order to prevent the community-spread, the state started sanitizing the streets and roads using disinfectant powders and sprays, which was later reported to be an inefficient method by WHO. The government took various quick responses and initiatives, such as preparedness by following the Standard Operating Procedure (SOP) in government hospitals - case definitions, laboratory protocols, case transport guidelines, preventive measures, hospital and ambulance disinfection protocols and case management. All the health care professionals treating or screening the COVID-19 cases were advised to use personal protective equipment (PPE) with masks. Considering the requirement more healthcare workers and experts were appointed on a temporary basis to serve during the pandemic. While critical screening of people with symptoms was going on, a sudden increase in the number of asymptomatic cases reduced the effectiveness of the previously conducted screening. More than 80% of the reported COVID-19 positive cases in the state are asymptomatic. Indian Council of Medical Research (ICMR) reported that airport screening, quarantine measures help to delay epidemic to a maximum of three days [1]. And also suggested the need to test for symptomatic people with no travel history. So, the state government began to test all the peoples with severe pneumonia [23]. For daily updates, a dashboard has been created officially which displays the district-wise number of tests conducted, active cases, recovered cases and deaths

After facing criticism for having tested a very low number of persons, the testing for the disease scaled-up over the time from totally 498 persons tested till 24th March to over 16,000 persons tested per day with 72 approved testing centers all over the state as of 12th June. The persons who had direct contact with the positive cases were also screened, isolated and given treatment. The case identification was made available and accessible with the implementation of ICMR’s lab-based surveillance. To identify the infections, protocols suggested by WHO, ICMR is being followed. The most recommended method of diagnosis is nasopharyngeal and oropharyngeal swab. SARS-CoV-2 RNA is detected 63% in nasal swabs compared to oropharyngeal swab (32%) [26]. For diagnosing the COVID-19 in patients many of the assays are uses such as Rapid antigen lateral flow assay, Serological method, random amplification deep sequencing method, Real-Time PCR assay (RTPCR), loop-mediated isothermal amplification, multiplex isothermal amplification followed by microarray detection, and CRISPR (clustered regularly interspaced short palindromic repeats)-based assays. The RT PCR assay is recommended for molecular testing of coronavirus. It minimizes the false-positive result associated with the amplification of product contamination [28, 29]. Till date, the state has 123 government hospitals and 169 private hospitals to treat SARS-CoV-2 infected patients. So far, the state has procured about 14 lakhs testing kits for diagnosis purposes. Based on the categories of symptoms and asymptomatic conditions, the patients are admitted one of the 3 categories of health facilities all over the state. The state has 167 centers under Category I - COVID Care Center (CCC), 105 centers under Category II - Dedicated COVID Health Center (DCHC) and 69 centers under Category III - Dedicated COVID Hospital (DCH).

All the above-said measures were taken only for limiting the rate of transmission and to decrease the epidemic peak. With these measures, as on 12th June 2020, Tamil Nadu is having 2nd largest recovery rate and keeping the fatality rate comparatively less (367 deaths) than many other states and even many other countries. Apart from the control measures, the state has even taken relief measures to the people who are directly or indirectly affected by the pandemic. Monthly financial assistance to about 4 million jobless workers of various sectors, migrant workers and poor is being provided since March. To ensure food safety, the availability of food material supplies at free of cost at state-run “fair price shops” of Tamil Nadu Civil Supplies Corporation and Amma canteens. The relief measures also include the extension of dates for paying various dues. In order to recover the economic losses expert team with former Governor of Reserve Bank of India, Prof. Rangarajan as head has been formed by the state government. On the other side healthcare agencies and research laboratories are working on in developing possible new treatments and vaccines to cure the disease.

Honorable Chief Minister of the state, Dr. K. Palaniswamy penned a letter to the public extending his moral support has stated the stand of the state in various crisis situations like drought, tsunami, various cyclones and floods that hit Tamil Nadu and reminded about how quick the state was back to the normal in all those situations along with the support of the public.
Impact of COVID-19 and Lockdown: The state is stumped due to the effects of the COVID-19 pandemic. Although the government at all possible ways is trying at its best in fighting the pandemic, there remains a series of issues making the situation a more complicated one. Most serious issues include people hiding their travel history, escaping of many COVID-19 positive cases from hospitals, and infected persons trying to dodge mandatory home quarantine which causes the indefinite spread of disease mostly in asymptomatic cases [6].

The state health minister in a press-meet expressed his frustration about the public not following the precautionary measures such as wearing masks in public places. These delays the state’s efforts in controlling the spread of the disease thereby leading to community transmission. Although all the control measures are being taken for the purpose of control and prevention of disease, there are various other impacts too. COVID-19 pandemic situation has its impact on different people differently based on their regional, economic, social status, etc. The sudden announcement of the pandemic lockdown has severely affected all the sectors due to an unorganized workforce. The announcement of the lockdown should have been prepared much better.

In the urge of addressing the pandemic, we have failed to concentrate on other linked problems. Since many hospitals and healthcare units stopped admitting outpatients with other complaints and decreased the inpatient counts, people have to suffer a lot in meeting their health emergencies other than the pandemic. In addition to that, the lack of transport services and fear of infection has locked the people in their homes. In a state where the birth rate is 15.0 per thousand [9], this situation has affected the pregnant women, postpartum women and neonatal. Since the COVID-19 disease affects the people with underlying health conditions, those suffering from chronic diseases, lacking immunizations and whose other medical needs were not addressed may have detrimental health conditions leading them to become an easy host for SARS-CoV-2. Another important issue is the relaxation of the lockdown at the time of increasing cases. However, this can be linked with an increase in the number of tests. Since the numbers are continuing to increase, it is not a good idea to give relaxations in the lockdown protocols. This relaxation can make the condition even worse in the immediate future causing a huge impact.

The measures to reduce the spread of infection has affected economic activities. This has had and having impact on the micro, small and medium enterprises (MSMEs). MSMEs contribute to about one-third of the nation’s GDP, with Tamil Nadu being the one among the large contributors which hosts employment of people from all over the nation in various sectors. The closure of production units, firms and various businesses has resulted in the loss of jobs and financial insecurity, in which the most affected are the daily wagers and migrant workers. This has affected a huge number of populations adversely. It is unfortunate that the first death of migrant workers in the country due to the COVID-19 pandemic lockdown happened in the Theni district of Tamil Nadu who struck in the forest fire while walking through a forest. From the Economic Survey 2016-2017 based on Cohort Migration Metric, it is evident that the state has the largest migrant population of about 1 million migrants in 20-29 age during 2001-2011. During 1991-2001 the same was just 26,000 [8]. This count shows how much migrant workers would have been affected. Furthermore, it is understood that how much the economy is affected due to the effects of COVID-19 and its control measures. The actual impact on the economy cannot be estimated until the global pandemic comes to an end.

During the pandemic, one of the most affected sectors is the education sector. Most of the educational institutes closed even before the announcement of the lockdown. The closure of schools and higher education institutes with the cancellation of examinations has raised a question of doubt about the capability of the students. Though many of the institutions in the state are making a revolutionary changeover from face-to-face teaching to providing online teaching to the students, not all the students are able to access this facility. This is due to various reasons, such as the non-availability of electronic devices with everyone, two students from a single home can’t share a single computer or gadget, the lack of network, etc. Moreover, this change has caused an increasing burden on the teachers who have to spend extra time in learning about how to use the online teaching portal and is also causing mental distress while handling the students virtually. Not just teachers, students are also facing various difficulties and negative physical and mental effects due to over usage of computers or any other devices. Meanwhile, Violence against women is reported to be increasing during this situation. Shalu Nigam, 2020 has reported various incidents of violence against women in Tamil Nadu [22]. Under the Domestic Violence Act 2005, the state has appointed protection officers to move and rescue women who are suffering from domestic violence.
Future Strategies: As the virus is highly contagious and because of the deficiency of herd immunity, with the current growth rate, various mathematical models have predicted the spread of disease in the state. Dr. G. Srinivas using a mathematical model has predicted that state may witness about 1.3 Lakhs COVID-19 cases with 769 deaths by the end of June. He has also said that about 1.5 lakhs people in the state capital will be infected by mid of July and the infection may reach the peak by the second week of October. Hence there is an urgent need for support from both government and public to reduce the spread and “flatten the curve”. Learning from the past and from other countries which are successful in handling the pandemic and prevent the spread, we can consider various possible strategies to help the state recover from this. The authors suggest a concentration on the following strategies to cope up with the situation.

1. Lockdown Extension: Although the extension of lockdown in the past has caused various detrimental effects on daily life, economy, mental and the physical wellbeing of the individuals, it is not the right time to lift the lockdown, especially in the worst affected districts such as Chennai, Chengalpattu, Thiruvallur, Kancheepuram, Thiruvannamalai and Cuddalore. Considering the fact that there is a sharp rise in the number of positive cases, instead of relaxation of the lockdown it is indeed necessary to implement strict lockdown in these districts with additional support from the government to serve the essential needs of the public. Lockdowns implemented so far has effectively supported the transmission of disease. Another strict lockdown will definitely have its impact on limiting the spread and stop the transmission moving to the next level. On implementing strict lockdown in the worst affected regions, sanitized mobile vans to provide daily essentials to the public can be established. This will help in reducing the panic situation among the public, thereby limiting the chances of transmission and administrative officers can have more concentration in eliminating the pandemic. When the decrease in the trend of the cases is witnessed, the lockdown can be relaxed step-by-step.

2. Increased Testing: During the extended strict lockdown, testing for SARS-CoV-2 can be geared up and a large number of populations can be tested, helping in identification, isolation and treatment. Adopting different method for rapid diagnosis of the disease can help in identifying the infected. Many counties affected by COVID-19 pandemic has started conducting large-scale serosurveys to measure the concrete number of COVID-19 cases. Kumar et al. 2020 has suggested a national sero-surveillance protocol to track infection transmission [18]. The state can conduct this survey at least in the most affected districts with required modifications. Sapkal et al, 2020 has developed an indigenous IgG ELISA to detect anti-SARS-CoV-2 IgG. This method has been proved to be sensitive as well as specific for the detection[24]. This may be helpful in conducting epidemiological surveys. Different strategies for rapid identification such as the use of rapid tests, lateral flow immunoassays and ELISA based tests, drive-through testing, school-based testing are being used in countries like Finland, France, USA, Germany Scotland, etc. [4,10,11,12,20,21,25,27]. The neighboring states like Andhra Pradesh, Kerala has largely increased mobile testing centers and walk-in mobile kiosks to sample testing. A handful of approaches for surveillance and contact-racing will help the government to choose the most possible between the options.

3. Medical Facilities: The rapid climb in the amount of COVID-19 infections has led to inadequate primary healthcare followed by an undocumented increase of mortalities due to illness other than SARS-CoV-2 infection. The state has to ensure the functioning of hospitals in treating various other health complications such as heart disease, nephrology related problems, diabetes, etc. Since the urban population of the state has access to alternate measures for healthcare needs such telemedicine, tele pharmacy, etc. it is very important to ensure the availability and accessibility of the basic healthcare facilities in the rural regions and the adequacy should be keenly monitored. The immune response of the people with an immune deficiency should be boosted up by available drugs.

4. Travel Monitoring: Usually, all the modes of transports will be overfilled with the crowd. In such a situation, if the public transport is resumed, the situation will get even worse leading to a community spread and failure in controlling the epidemic. It is good to halt public transport until there is a decline in the daily number of cases identified in the state. In order to provide the transport facility, the concept of more number of frequently sanitized vehicles with less number of passengers can be continued.
5. **Business and Economic Revival**: In addition to economic grants announced by the Government of India, the state has to announce sector-wise grants which benefit all the affected. The organizations and companies which are paying their employees even during the shutdown should not be neglected. Special grants and aids should be provided to all the business sectors to recover from the loss and economic deficit. In doing so, the state can experience a good comeback from the crisis in the long run.

6. **Migrants and Poors**: The outflow of the migrants and inflow of people from other districts and states should be monitored. Monitoring the flow will help in keeping the epidemic trend to the lowest possible. In addition to relief funds announced so far, policy decisions can be taken keeping the poor in mind.

7. **Education Policies**: As the prevalence of pandemic is not definite and complete disease-free situation is not predictable, education of the students should not be affected. Most of the institutions in the state are providing e-learning facility to the students where students are benefitted by the online teaching platforms and resources. However, it is necessary to ensure safe online platforms ensuring the mental well-being of the teachers and students. Guidelines can be formulated in reframing the syllabi to continue delivering quality education during and after the pandemic.

8. **Domestic Violence**: This pandemic crisis has created a place to renew the thoughts and already existing gender inequalities ideas. The Secretary-General of the United Nations has urged the nations to give priority and support for the arrangement of warning systems for those suffering from family violence [15]. In addition to the previous measures taken by the state government in this regard, the government can also start allocating funds to prevent the domestic violence occurring in COVID-19 pandemic situation. And it is essential to take strict actions against the accused to curb the domestic violence.

9. **Public Support**: In spite of the measures taken by the government in fighting and eliminating COVID-19, this will not be possible without the support from the public. By understanding this crisis situation, it is necessary that people follow all the government advisories, protective measures with patience to control the spread of the disease.

10. **Adapt for the Future**: It is important to remember the last pandemic, the Spanish flu which horrified the world in 1918 with its effects and aftermath. The Spanish flu lasted for about 2 years. So, this pandemic has had a great impact on the normalcy of the nations, and also more impact is expected in the future. However, with the advancements of the 21st century in various fields of science medical and healthcare facilities, the human race will come out of this tragic situation with more strength and enthusiasm. But it is important to devise a way by which we are going to achieve that. In this crisis situation, people has also understood how much nature and the environment has been exploited and from these lessons we must correct ourselves, with adaptiveness and step forward for a better future.

**Conclusion**

The SARS-CoV-2 infection is threatening the world nations with its deadly COVID-19 disease. With no particular treatment method, the healthcare workers are indefinitely working towards the service of the people. Whereas the researchers are tirelessly experimenting on finding a cure or vaccine for the disease. Tamil Nadu is one of the most affected states in India. Even though the number of positive cases is increasing day-by-day, with the relentless and collective efforts of all the departments of the state, COVID-19 has not yet reached the community spread level. With a population of more than 7 crore people, the state is running very empathically with all its efficiency and past experience in managing the crisis situations. With the experience of the past, and effective numerable control measures along with relief measures, the impact has been decreased and situation is still under control. It is important to continue the efforts to improve the situation and come out of this crisis. The involvement and commitment of the public are very much needed for this cause.

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**Conflict of Interest**: Nil
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Prevalence of Musculoskeletal Pain among Oral and Maxillofacial Surgeons

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Abstract

Purpose: Musculoskeletal pain have been an issue of concern for Oral and Maxillofacial surgeons for a long time now. The aim of this study is to find the prevalence of musculoskeletal disorders among oral and maxillofacial surgeons. Method: A cross sectional Analytic study was implemented. The association of musculoskeletal pain and posture, loupes and demographic characteristics where explored. Chi-square analyses were used to compare the different participant responses and the variables and multiple logistic regression was used to determine the significant relationship. Result: Out of a total of 100 Maxillofacial Surgeons 96% and 45% reported to always preferably stand during OT procedures and extractions. Lower back, neck and shoulder were the main regions that pain was reported. Surgeons who opted to sit during extractions experienced pain in elbow (P=0.009). Lower back and neck pain was found to be more common among surgeons who does not use loupes which may be due to the tensed flexion activity of the muscle. Conclusion: Majority of the subjects had pain in the lower back and no statistical association was found out between age and the incidence of pain. It was also found that majority of the subjects who refrained from using loupes had experienced pain at multiple sites.

Keywords: Musculoskeletal pain; prevalence; surgeons; work related.

Introduction

Musculoskeletal disorders are a group of injuries caused by repetition, overexertion, and bodily movement such as chronic neck flexion and repetitive forceful tasks. Doctors are the exposed to a wide variety of occupational diseases among which musculoskeletal pain is one of them. Dentists particularly oral and maxillofacial surgeons are most prone to musculoskeletal pain often due their abnormal posture during working, narrow visual field of the oral cavity and working with a limited scope of movement. Musculoskeletal pain reflects on a number of conditions, such as neck pain, backpain, shoulder pain, pain of limbs, carpal tunnel syndrome, myofacial dysfunction syndrome, atypical facial pain etc. Literature shows that lower back pain was the most common presentation among surgeons who operated in the standing posture.

While some forms of musculoskeletal pain are light, transitory, asymptomatic or even undiagnosed, others may be severe, irreversible and incapacitating. These severe and persistent pain, functional restrictions, and disability associated with musculoskeletal disorders

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can affect the daily activities, quality of life, ability to earn a living and independence of those affected thus leading early retirement. Fortunately, it is found that good ergonomic practices can drastically reduce these musculoskeletal pain symptoms. Hence, a study based on Nordic questionnaire was conducted among oral and maxillofacial surgeons to determine the prevalence of musculoskeletal disorders among them.

**AIM**

To find the prevalence of musculoskeletal disorders among oral and maxillofacial surgeons.

**Objectives:**

1. To find the association among demographic features, postural preferences and pain
2. To find the distribution and prevalence of musculoskeletal disorders

**Materials and Method**

This cross-sectional and analytical questionnaire study was carried out in the Department of Oral and Maxillofacial surgery, Meenakshi Ammal Dental College, Maduravayol, Chennai. This study was approved by the Institutional Ethical Committee and Review Board of MAHER University. The subjects included practising oral and maxillofacial surgeons.

**Sample Size:** A total of 100 practising oral and maxillofacial surgeons were included in the study

**Inclusion Criteria:**

1. Practising oral and maxillofacial surgeons only

**Exclusion Criteria:**

1. Physically challenged professionals
2. Pregnant women doctors
3. Any pre-existing health conditions.
4. Degenerative, inflammatory rheumatic diseases and diseases of the central nervous system.
5. Previous history of Musculoskeletal pain before joining dentistry

**Preparation and Distribution of Questionnaire:**

A questionnaire was prepared and distributed to oral and maxillofacial surgeons in with a letter of explanation. Respondents were advised that return of the completed questionnaire constituted informed consent.

Musculoskeletal symptoms were investigated using a self-administered, purpose-designed questionnaire prepared online using Google Forms. Questions were based on the standardized Nordic Musculoskeletal Questionnaire (NMQ), which was used to record work-related musculoskeletal symptoms in working populations. Kuorinka et al and his team developed the NMQ with the support of the Nordic Council of Ministers. This simple, generalized and internationally validated questionnaire was used to detect symptoms in the neck, back, shoulders and extremities. Respondents were asked whether they had ever experienced work-related pain or discomfort.

**Demographic Characteristics:** The complete questionnaire was distributed among oral and maxillofacial surgeons through the social media application, WhatsApp.

The questions asked were categorized into 3 sections – demographic characteristics (Fig 1), surgeon’s behaviour (Fig 2) and pain (Fig 3), as given in the proforma. The surgeon’s behaviour included the use of loupes and postural preferences by the surgeon during procedures – extraction, impaction, implant, operation theater (OT).
Surgeons Behaviour:

**Figure 1: Proforma section 1**

**Figure 2: Proforma section 2**
Demographic characteristics included information on age, sex, marital status, body weight, exercise, years of practice, type of working sector, number of patients per day, dental assistance, usage of direct and indirect vision.

Age in years was categorized as 30s, 40s etc. the subjects were asked to check the answer as “Yes” or “No” with regard to their exercise activity. The duration of the clinical practice of the subjects was categorized into 5 or fewer, 6-10 years, 11-20 years, 20-30 years, and more. The type of working sector was divided onto private, institutional and combined.

Data under the surgeon’s behaviour included the use of loupes and postural preferences during procedures like extraction, impaction, implant surgery and in operation theater.

Postural preferences was analysed as “always stand” for those who stand all the time, “always sit” for those who always sit for the procedures and “sometimes sit” for those who sit in between procedures for better access and vision. Use of loupes as classified as “I use loupes”, “I do not use loupes”, “I sometimes use loupes”. Pain was assessed in different regions of the body by a single yes or no question.
Data analysis: The data was collected using Google Forms, a secure web-based data collection application by google. Chi-square analyses were used to compare the different participant responses and the variables and multiple logistic regression was used to determine the significant relationship. The analysis was completed using Statistical Package for the Social Sciences software (SPSS version 16, IBM).

Results

Pain: All 100 participants have reported to have pain at different sites. The participants who responded, reported neck pain (56%), shoulder pain (48%), upper back pain (48%), elbow pain (12%), wrist or hand pain (32%), lower back pain (62%), hip or thigh pain (8%), knee pain (15%) and angle or feet pain (21%). Out of all the sites, the individuals who had pain in lower back was the most predominant (Table 1).

Pain and posture: Most of the practitioners reported to always stand during extraction. Surgeons who opted to sit during extractions experienced pain in elbow (P=0.009). Majority of the practitioners reported lower back pain following all 4 procedures. It was reported that practitioners preferred to always sit during implants and impaction. Majority of them who “always sat “experienced lower back pain the most. It was also noted that surgeons who reported “always sit” for implant procedures experienced more wrist and hand pain (P=0.037). Lower back pain was reported by a significant number of surgeons choose to always stand during OT procedures (Table 2).

Table 1: Variations in pain outcomes

<table>
<thead>
<tr>
<th>Pain</th>
<th>N</th>
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<tbody>
<tr>
<td>Neck</td>
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<td>56%</td>
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<tr>
<td>Shoulder</td>
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<tr>
<td>Upper Back</td>
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<tr>
<td>Knee</td>
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<td>15%</td>
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<tr>
<td>Angle or Feet</td>
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Table 2: Postural preference and pain

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<th>Upper Back</th>
<th>Elbow</th>
<th>Wrist or Hand</th>
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<tr>
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<td>23</td>
<td>23</td>
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<td>7</td>
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Pain and demographic characteristics: There was a statistical association found between pain and years of practice. 14% of the participants, with years of practice 5 or fewer reported pain in the angle and feet. (P=0.027) which tends to decrease with experience. A marked significance was also found between type of working sector and pain where 7% practitioners working in both institution and private sectors experienced more elbow pain(P=0.018). Most of the practitioners used direct vision for treatment and has reported to experience pain in all sites but a significance was noted in wrist and hand pain (P=0.007). It was found that practitioners between body weight of 61-80 kgs show significant value (P=0.058) (Table 3)

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<th>Hip or Thigh</th>
<th>Knee</th>
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<td>.717</td>
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<th>Hip or Thigh</th>
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Pain and loupes: Most of the surgeons who responded opted not to use loupes during procedures. It was reported that loupes were mainly used during implant procedures by surgeons. 60% of the practitioners who did not use loupes reported to have experienced lower back pain during impaction. Statistically shoulder pain (P=0.056) and hips and thigh pain (P=0.023) showed evident significance in case of implant placement. It can be observed that pain in the lower back was the most evident in majority of surgeons in during all 4 procedures. (Table 4).

Table 4: Use of loupes and pain

<table>
<thead>
<tr>
<th></th>
<th>Neck</th>
<th>Shoulder</th>
<th>Upper Back</th>
<th>Elbow</th>
<th>Wrist or Hand</th>
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<td>45</td>
<td>12</td>
<td>31</td>
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<td>6</td>
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<td>20</td>
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</tbody>
</table>
Neck Shoulder Upper Back Elbow Wrist or Hand Lower Back Hip or Thigh Knee Angle or Feet
Sometimes use 3 1 1 0 0 1 2 2 0
P-value .188 .056 .437 .509 .270 .117 .023 .203 .492

Impaction
Use loupse 1 0 1 0 0 1 0 0 0
Do not use 52 47 46 12 32 60 7 14 21
Sometimes use 3 1 1 0 0 1 1 1 0
P-value 0.488 0.396 0.379 0.698 0.290 0.224 0.425 0.781 0.497

Surgery
Use loupse 2 0 1 1 1 1 0 1 0
Do not use 41 39 31 8 25 44 6 12 16
Sometimes use 13 9 16 3 6 17 2 2 5
P-value .870 .158 .030 .478 .865 .167 .862 .484 .656

Discussion
Musculoskeletal pain is one of the most important and common occupational health hazards in the working population today. Dentistry among the various occupations, is the most common to develop musculoskeletal pain in which oral and maxillofacial surgeons are the most prone. This may be due to their narrow visual field in oral cavity, working with minimal scope of movement, minimal lighting, which puts them in high risk of neck, shoulder and lower back pain. A polish study reported that the most musculoskeletal problems among dentists was in the lumbar thoracic region [5]. The present study was conducted to find the prevalence of musculoskeletal pain among oral and maxillofacial surgeons by preparing an online questionnaire based on Nordic questionnaire as this appears to be an accepted method of measuring the prevalence of musculoskeletal complaints. The provided self-reported information given by the oral and maxillofacial surgeons can be of clinical relevance for assessment of the occupational health hazard among this profession [1-3].

The most prevalent regions that reported to have pain is the back, shoulder and neck. However, the reported prevalence for these regions varied greatly between each studies. A noteworthy difference in the range of results was also seen [4,10-12]. Finsen et al study among dentists showed that prolonged neck flexion and upper arm abduction were found, as well as high static muscle activity levels (sphenius and trapezius muscles) thereby reporting neck and shoulder pain [9]. A study conducted by Khalid AlWazzan KA concluded that out of 111 candidates who reported pain most them neck and back pain was the most prevalent [7].

Many other possible risk factors have been identified in literature that shows no correlation with any kind of prevalence. Akesson et al in his study stated that the clinical work of dentists and dental hygienists is visually demanding, with a high work zone and unsupported forearms, using repetitive motions with fine tuned actions and using vibrating instruments [6]. Clinical work involving these characteristics are the basis for static neck position, extended neck flexion and poor posture that are also associated with musculoskeletal complaints. A study of Marklin RW concluded that in the working postures of dentists and dental hygienists, both professions spent 86% of their working time with a neck flexed at least 30° and 53% and 50% of their work time respectively and with a trunk flexion of at least 30° was also noted [8]. In our study, a significant number of the respondents reported pain in lower back, neck and shoulder.

Most of the participants reported that they always stand during operation theater procedures (96%) and extraction (45%). Surgeons who always sat during extraction procedures experienced more of elbow pain. There no significance between age and pain. It was noted that surgeons, working in both institutional and private sectors combined experienced more elbow pain which was statistically significant. In spite of working with dental assistance, surgeons experience mainly lower back pain. Many studies done have shown back pain reported the most [4]. Similarly, a study was conducted among dental hygienists reported to have back pain [13].
This may be due to the improper posture positions of the surgeon during procedures.

Most of the surgeons do not use loupes while doing procedures but these practitioners reported to experience pain loupes predominantly in the lower back and neck region. This may be due to the tensed flexion activity of the muscle. Surgeons have report pain even after using loupes. Those who used loupes might be using it for better magnification of the surgical site and was reported to be used more during Implant surgeries. another significant finding is that practitioners who did not use loupes experienced more shoulder and thigh pain during implant procedures.

After analysing the data, it was recognized that further questioning would be needed to determine certain other associations. More follow up questions can be asked on whether the pain had subsided if practitioner had changed the working posture to determine the surgical postural preference and correlate them to musculoskeletal pain.

**Conclusion**

From our study, we conclude that the majority of the subjects had pain in the lower back and no statistical association was found out between age and the incidence of pain. It was also found that majority of the subjects who refrained from using loupes had experienced pain at multiple sites.

**Funding:** No Funding received for the study

**Conflict of Interest:** The Authors declare that they have no conflict of interest

**Ethical approval:** This questionnaire cross sectional study was approved by Meenakshi Academy of Higher Education and Research” declared as deemed to be university under section 3 of the UGC act 1956”

**Informed Consent:** Informed consent was obtained from all individual participants included.

**References**

DNA Extraction from Archived Paraffin Embedded Tissues: A Comparative Study Using Three Different Extraction Methods—Extraction of DNA from Paraffin Embedded Tissues

Shruthi Suresh¹, Kavitha B.², Sivapathasundharam B.³

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Abstract

Objective: Formalin fixed paraffin embedded (FFPE) tissue is a valuable source of nucleic acids required for various molecular studies. The purpose of the present study was to extract Deoxyribonucleic acid (DNA) from archival retrieved FFPE oral squamous cell carcinoma tissues using three different extraction methods (salting out, commercial kit and microwave method) and to compare the yield of DNA extracted by these methods.

Method and Material: 30 oral squamous cell carcinoma paraffin embedded tissue blocks were categorized into three groups based on the duration of storage as Group A(<2 years), B(2-4 years) and C(4-6 years). The tissue sections made from these blocks were subjected to three DNA extraction methods and the DNA yield was measured using a spectrophotometer. The extracted DNA was checked by successful amplification of p53 gene using Polymerase Chain Reaction followed by gel electrophoresis. The values of DNA yield and purity were statistically analysed and the level of significance was set at \( P \leq 0.05 \).

Results: The DNA yield was above 3µg in all the three extraction methods. On multiple comparison, the mean DNA yield was statistically significant (\( P \) value<0.05) among the three methods in Group A. Also, the DNA yield was found to be higher in salting out method though successful amplification was obtained from the extracted DNA in other extraction method as well.

Conclusions: DNA was successfully extracted from all the tissue samples using all the three methods. Salting out method yielded the maximum amount of DNA compared to the other method and shall be a good cost effective alternative.

Keywords: DNA; Paraffin embedding; Polymerase Chain reaction; Oral squamous cell carcinoma.

Introduction

There are about a trillion cells in the human body containing the vital source for life, the Deoxyribonucleic acid (DNA) in their nucleus. Isolation of genomic DNA is the key step for numerous applications and molecular studies ranging from basic research to routine diagnostic and therapeutic decision-making.¹ The extracted DNA is used to study alterations in the DNA sequence which is responsible for development and progression of various pathologic conditions. A wide variety of techniques have been employed to extract DNA from different sources such as body fluids, cell cultures, animal tissues (fresh, frozen or fixed) and microorganisms.² The archived Formalin Fixed Paraffin embedded (FFPE) tissues are
an excellent source for recovery and analysis of nucleic acids which has become an important tool for cancer research over the last decade. Fixation techniques, formation of protein cross links, storage condition and duration makes DNA extraction from FFPE tissues challenging. Hence the need arises to choose the best method of DNA extraction to obtain maximum yield of the purest form of DNA and that which can be amplified. The present study was aimed to extract DNA from archival retrieved paraffin embedded oral squamous cell carcinoma (OSCC) tissue blocks using Salting out method, Commercial kit method and Microwave method and to estimate and compare the extracted DNA quantitatively and qualitatively in all the three method using spectrophotometer and gel electrophoresis respectively. The assessment of successful DNA extraction from the three method was done by PCR amplification of p53 gene. 

**Materials and Method:**

A total of 30 archival retrieved tissue blocks previously confirmed histopathologically as oral squamous cell carcinoma were chosen for this *in-vitro* study. Ethical clearance for the study was obtained from the Institutional Review Board. The tissue blocks were categorized into three groups based on the duration of storage as Group A (10 blocks stored for duration of <2years), Group B (10 blocks stored for duration of 2-4 years) and Group C (10 blocks stored for duration of 4-6 years). Ten sections of 10μm thickness were cut from each paraffin embedded tissue block. The sections were collected in a 2mL micro centrifuge tube (Tarsons, Kolkata, India). The same numbers of sections were collected from each case, in three different tubes.

**Deparaffinisation:** 1 ml preheated xylene was added to each micro centrifuge tube containing the sample. The tubes were incubated at 56ºC for 10 minutes in a water bath for dissolution of paraffin and were centrifuged (REMI, Mumbai, India) at 10300 rpm for 5 minutes. The supernatant was decanted without disturbing the pellet. A new change of preheated xylene was added. The steps were repeated until the paraffin was completely removed.

**Tissue Digestion:** The pellet was washed in 100% ethanol (500μl) to remove any residual xylene. The cells in the tissue pellet were lysed using a homogenizer and then centrifuged at 10300 rpm for 5 minutes. The pellet was washed in 95% ethanol (500μl) followed by 70% ethanol (500μl). The homogenization and centrifugation steps were repeated before and after the ethanol washes. 200-400μl of 250μg/μl Proteinase K (MP Biomedicals, USA) containing digestion buffer was added to break the peptide bonds of proteins. The tissues were digested by incubating them at 55-60ºC for 3-5 days in an orbital shaking incubator (REMI, India). 250μg/μl proteinase k (working concentration) was replaced daily. Proteinase K was inactivated after adequate tissue digestion by heating at 95ºC for 10 minutes as they might interfere with further analytical procedures.

**Salting Out Method:** 200μl of Ammonium acetate (3.5M) solution was added to precipitate proteins as they are less soluble in high salt concentration. The tubes were vortexed using a cyclomixer (REMI, Mumbai, India) for 20 seconds and were incubated on ice for 5 minutes followed by centrifugation at 14300 rpm for 3 minutes. The supernatant containing DNA was transferred to another tube. 600μl of Isopropanol was added to the supernatant in order to precipitate DNA. The samples were centrifuged at 16300rpm for 5 minutes. The DNA pellet was washed in 70 % ethanol (500μl) to remove any residual salt attached to the DNA. The tubes were centrifuged at 16300rpm for 2 minutes. The supernatant was discarded and the remaining ethanol was allowed to evaporate. DNA was dissolved in 30-50μl of TE (Tris EDTA) solution. Extracted DNA was stored at 4º C.

**Commercial Kit Method:** The commercial QIAamp DNA Mini Kit (Qiagen, Gmbh, Germany) was used according to the manufacturer’s protocol. The dewaxed tissues were digested with 180μl ATL (Animal Tissue Lysis) buffer and homogenized. Tissue lysis was carried by incubating the tubes at 56ºC for 1-3 hrs with Proteinase K (20μl) until complete tissue lysis. Buffer AL (200μl) was added. Pulse vortexing for 15seconds was done and incubated at 70ºC for 10 minutes. 200 μl Ethanol (96-100%) was added and vortexed. The solution was transferred into a spin column, centrifuged for one minute at 8000rpm, and washed with AW1 and AW2 buffers. DNA was eluted by 1 minute incubation at room temperature with 50μl elution buffer AE and was collected by centrifugation at 8000 rpm for 1 minute. The DNA was stored after eluting in Buffer AE by placing it at -20ºC.

**Microwave Method:** 200μl of digestion buffer (1M NaCl; 1M Tris -HCl, pH8; 0.5M EDTA, pH 8; 10% Sodium Dodecyl Sulphate) was added to the tissue sections and was subjected to high power microwave
irradiation for 1.5 minutes for deparaffinisation. This technique was xylene free. Irradiation time was split into 15 segments to prevent over boiling. Centrifugation for 10 minutes at room temperature was done. The paraffin wax ring formed above the buffer was removed. Tissue pellet was digested in 200μl digestion buffer containing 200μl/ml Proteinase K at 56°C overnight. Centrifugation at room temperature at 8000 rpm for 5 minutes was done. Supernatant containing DNA was collected in a separate tube. It was boiled for 10 minutes at 95°C to denature proteinase and proteins. DNA present in the supernatant was precipitated using the salting out method. [5]

**Evaluation Of Extracted DNA:** Yield of DNA and electrophoretic pattern: For each extraction method, the DNA purity was calculated using the A260/A280 ratio with a spectrophotometer (Eppendorf Bio Spectrometer). DNA yield was calculated using A260. [6]

**Polymerase chain reaction:** The DNA isolated using the three method was used for amplification of a 196bp fragment of p53 gene. Quantitative RT-PCR was performed with the Stratagene MX3000P (Agilent technology). The double standard DNA-binding dye SYBRGreenI(KAPA SYBRFAST qPCR Kit)and primers for p53 (Forward: 5’-CTTGCCACAGGTCTCCCC-3’ and Reverse: 5’-GCCACTTGCCACCCCTGCACA-3’) were used. Amplification conditions were 30 seconds at 95°C, 30 secs at 60°C and 30 secs at 75°C for 35 cycles.

The amplified PCR products were visualised using a gel electrophoresis with standard 2.0% agarose gel containing ethidium bromide stain under ultraviolet light. The optical densities of the electrophoretic bands were determined using Quantity One software. [6]

**Statistical Analysis:** The values of DNA yield and purity obtained using the three DNA extraction method for the three sample groups (Group A, B and C) were statistically analysed using the software Statistical Package for Social Sciences (SPSS), IBM Corp., Version 16. The level of significance was calculated by ANOVA test and Tukey test (for multiple comparison). Probability value (p value) less than 0.05 was considered statistically significant.

**Results**

All the three DNA extraction method provided a yield of DNA above 3µg which was considered to be good and were of adequate amount to perform PCR reaction. (Table 1) On multiple comparison of mean DNA yield obtained from the three different method, the difference in the DNA yield was statistically significant among all the three method (p value<0.05) in group A and the difference in the DNA yield between kit method and microwave oven method was not statistically significant (p value >0.05) in Groups B and C. (Table 2) The average purity of DNA obtained using the three method were within the range of 1.7 to 2.0. There was no statistical difference in the average purity among the three method (p value >0.05). (Table 1) On multiple comparison of mean DNA purity obtained from the three different groups using the kit method, the difference in DNA purity was statistically significant only between Groups A and C. (Table 3) However, a comparison of DNA quantity among the groups was not possible as standardization of the tissue samples by weight was not done.

<table>
<thead>
<tr>
<th>Table 1: Mean DNA yield and purity obtained using the three DNA extraction method from the three groups.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group A</strong></td>
</tr>
<tr>
<td>Mean DNA Yield ± S.D(µg)</td>
</tr>
<tr>
<td>Salting out</td>
</tr>
<tr>
<td>Kit</td>
</tr>
<tr>
<td>Microwave</td>
</tr>
<tr>
<td>P value (ANOVA)</td>
</tr>
</tbody>
</table>

P value <0.05 is significant; S.D: Standard Deviation
Table 2: Multiple comparison of mean DNA yield and purity among different extraction method in Groups A, B and C.

<p>| (Method)- | Group A (P value) | Group B (P value) | Group C (P value) |</p>
<table>
<thead>
<tr>
<th>Comparison</th>
<th>DNA Yield</th>
<th>DNA Purity</th>
<th>DNA Yield</th>
<th>DNA Purity</th>
<th>DNA Yield</th>
<th>DNA Purity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salting Out</td>
<td>0.000</td>
<td>0.134</td>
<td>0.000</td>
<td>0.995</td>
<td>0.000</td>
<td>0.784</td>
</tr>
<tr>
<td>Microwave</td>
<td>0.000</td>
<td>0.141</td>
<td>0.000</td>
<td>0.865</td>
<td>0.000</td>
<td>0.664</td>
</tr>
<tr>
<td>Kit</td>
<td>0.008</td>
<td>1.000</td>
<td>0.039</td>
<td>0.814</td>
<td>0.015</td>
<td>0.987</td>
</tr>
<tr>
<td>Microwave</td>
<td>0.008</td>
<td>1.000</td>
<td>0.039</td>
<td>0.814</td>
<td>0.015</td>
<td>0.987</td>
</tr>
</tbody>
</table>

Table 3: Multiple comparison of mean DNA purity among three different groups in kit method

<table>
<thead>
<tr>
<th>Groups (Comparison)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A vs Group B</td>
<td>0.14</td>
</tr>
<tr>
<td>Group A vs Group C</td>
<td>0.05</td>
</tr>
<tr>
<td>Group B vs Group C</td>
<td>0.87</td>
</tr>
</tbody>
</table>

P value <0.05 is significant

DNA extracted from the three method in all three groups was assessed for amplification of 196 bp fragment of p53 gene by real time PCR. All the samples of extracted DNA from the three method belonging to Group A, B and C showed successful amplification.

The amplified PCR products were analysed by electrophoresis on 2.0% agarose gel with ethidium bromide staining viewed under UV light. A band was noted at the level of 196 bp in comparison with the DNA ladder indicating successful amplification. However, variation in the intensity of the bands was noticed. The intensity of bands in gel electrophoresis is proportional to the amount of amplifiable DNA. (Figure 1) In the present study, the kit method showed no statistical difference in the mean optical density units among the three groups. (Table 4) The salting out and microwave method showed a statistical difference in Groups A and B and also in Groups A and C. (Table 5).

![Amplified 196 bp fragment of p53 on gel electrophoresis by all three extraction method](image)

**Figure 1:** Amplified 196 bp fragment of p53 on gel electrophoresis by all three extraction method

Table 4: Mean optical density units in Groups A, B and C

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean O.D ± S.D (Salting Out)</th>
<th>Mean O.D ± S.D (Kit)</th>
<th>Mean O.D ± S.D (Microwave)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>8129±653.3</td>
<td>8664±1534.7</td>
<td>7415±925.7</td>
</tr>
<tr>
<td>B</td>
<td>6423±656.9</td>
<td>8117±496.15</td>
<td>6038±999.6</td>
</tr>
<tr>
<td>C</td>
<td>5802±597.5</td>
<td>7778±531.0</td>
<td>5408±631.9</td>
</tr>
</tbody>
</table>

(P value) 0.000 0.145 0.000

P value <0.05 is significant; O.D: Optical Density, S.D: Standard Deviation
Table 5: Multiple comparison of mean optical density units in Salting out and microwave oven method

<table>
<thead>
<tr>
<th>Groups (Comparison)</th>
<th>Salting Out ((P\text{ value}))</th>
<th>Microwave ((P\text{ value}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A vs Group B</td>
<td>0.004</td>
<td>0.000</td>
</tr>
<tr>
<td>Group A vs Group C</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Group B vs Group C</td>
<td>0.253</td>
<td>0.093</td>
</tr>
</tbody>
</table>

*P* value <0.05 is significant

**Discussion**

The nature of genetic alterations occurring in the cells may be responsible for the clinical behaviour of tumours. Hence, examination of DNA from various tumours is necessary to correlate alterations in the genetic setup clinically and histologically and also to study various biomarkers that can be used in prognosis and targeted therapies or personalised medicine for tumours. Since extraction of DNA from fresh samples of similar tumours at a time may be practically difficult, many attempts have been made to extract DNA from stored formalin fixed paraffin embedded tissues that were previously prepared for routine histopathological examination. The present study was one such attempt to check the possibility of genomic DNA extraction from archival retrieved paraffin embedded tissue blocks. There are many physical and chemical factors (incubation time, temperature and materials used for extraction process, etc.) that affect the extraction of DNA from these tissues which subsequently affects further analytical procedures. Therefore it is essential to choose a suitable method from a wide range of protocols for efficient genomic DNA extraction with sufficient yield and purity. It should ideally be simple, reliable and cost effective.[7]

In the present study, the average yield of DNA from all the three study groups using the three extraction method was greater than 3 μg. According to W. Tang et al, 2009, DNA yield of 1 to 3 μg from three 5μm sections was considered typically good.9 Rivero et al, 2006 and Mirmomeni et al, 2010 obtained significant DNA yield of more than 3 μg using kit method (11-14μg and 7.5-69μg) and salting out method (8-31μg and 6.5-93μg) from FFPE tissues respectively.[4,6]

In Groups A, B and C, maximum DNA yield (μg) was obtained using the salting out method followed by the kit and microwave oven method. Salting out method compared to other method yielded maximum DNA in all the three groups. Kit and microwave method of DNA extraction yielded similar amount of DNA in Groups B and C whereas in Group A, kit method yielded more DNA compared to the microwave method. In the present study, least DNA yield was observed in samples extracted using the microwave oven extraction method (12.37 μg, 9.09 μg and 7.46 μg). This was contrary to Sato et al (2001), who observed mean DNA yield of 76μg in microwave method compared to other method.[9] This reduction in DNA yield using microwave extraction in the present study could have resulted due to an extra purification step that was performed to eliminate the reagent SDS (Sodium Dodecyl Sulphate) which is a potent inhibitor of PCR as proposed by Gelfand et al.[10] As per Sato et al, 2001, better DNA yield in his study using the microwave oven method might be due to lesser DNA loss attributed to less number of changes from the micro centrifuge tubes.[9]

In the present study, Salting out method showed significantly higher yield in comparison with the microwave and commercial kit method. Isola J et al, 1994 found that prolonged incubation time improved total DNA yield greatly compared to shorter incubation periods. This is applicable to the present study, as salting out method had a prolonged incubation time (3 days) compared to the kit (3 hours) and microwave method (overnight).[11]

The values of DNA purity obtained in the present study were within the range of 1.7 to 2.0 which was suggestive of ‘clean DNA’ according to Mirmomeni et al, 2010 who had obtained DNA of purity in a range of 1.66 to 1.97.[6] DNA of acceptable purity was obtained in all the three method which was in contrast to the study by Watanabe et al, 2017, where the kit method provided DNA of better purity when compared to the other method.[12]

The assessment of successful DNA extraction using the three method from the three sample groups was confirmed by a PCR amplification of 196 bp fragment of p53 gene. The genomic DNA obtained from all the samples were efficiently amplified. The intensity of the bands formed after gel electrophoresis of the PCR products denote that the amplifiable DNA was higher in the samples extracted using the kit method although the yield was maximum in the salting out method. This is in accordance with Gilbert et al, 2007, who observed that the total DNA content does not essentially represent
the quantity of DNA that is amplifiable by PCR. Also, the increased nucleic acid – protein cross link reversal properties of the components in the kit extraction buffers when compared to the conventional buffers yield higher levels of PCR amplifiable DNA by kit method.[13]

Studies by Shi et al, 2004 and Sato et al, 2005 suggested that reduction in the DNA manipulations can be done in order to improve the efficiency of PCR by avoiding few steps used in the regular extraction protocol. However, the purity of the DNA obtained may be compromised. [14,9] Though the kit method had minimal DNA manipulation, DNA of acceptable purity was obtained in the salting out and microwave method also.

The comparison of mean optical densities of the PCR products suggested that the amount of DNA that can be successfully amplified reduced progressively with longer duration of storage of the FFPE samples. This was in accordance with a study by Liborio et al, 2005, who observed a linear decrease in the number of successful amplifications with an increase in storage duration from FFPE tissues stored over a period of up to 40 years. This was due to the presence of high concentration of small DNA fragments which compete with the template DNA leading to very low or absence of amplification.[7]

**Conclusion**

In the present study, though the DNA yield was compared among the three different method within the groups, we were unable to compare DNA yield among the three different study groups as the standardisation of samples by weight was not done. Salting out method yielded the maximum amount of DNA compared to the other method in all the three groups. The purity of the extracted DNA was similar by all the three method in all the three groups and within the established range of clean DNA. The amount of amplifiable DNA fragments were found to be reduced with an increase in the storage time. Though commercial kit is a rapid method for DNA extraction, it is expensive. As an alternative, other method like salting out method can be tried for DNA extraction from paraffin embedded tissue samples as it is less expensive. Improved technical measures to enhance the amount of amplifiable DNA from salting out and microwave oven method are necessary.

**Ethical Clearance:** Nil  

**Source of Funding:** Meenakshi Academy of Higher Education and Research, Chennai, India.

**Conflict of Interest:** Nil

**References**

5. PKS Chan, DPC Chan, KF To, MY Yu, JLK Cheung, AF Cheng. Evaluation of extraction method from paraffin wax embedded tissues for PCR amplification of human and viral DNA. J Clin Pathol 2001;54:401-3.


Smile Designing Using DSD: A Case Report

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¹Associate Professor, ²Post Graduate Student, ³Assistant Professor, ⁴Professor, Department of Prosthodontics, Meenakshi Ammal Dental College & Hospital, Chennai

Abstract

A Captivating Smile Showing an even row of natural gleaming white teeth is a major factor in achieving that elusive dominant characteristic known as Personality – Dr. Charles Pincus. An aesthetic smile has always been an attractive element and it plays a significant role in overall psychology and confidence level of an individual. In Current day dental practice with increasing patient’s aesthetic expectations, smile designing has evolved leaps and bounds in the past decade with the advent of new materials and technical improvement as well. One such recently evolved technique is the application of software in creating smiles using Digital smile Design Software. This case report enlightens about one such smile make over using Digital Smile Design Software.

Keywords: Smile Designing, Digital Smile Design, Lithium disilicate veneers.

Introduction

Confidence is an important aspect of one’s personality and a confident smile makes the picture complete[1]. In modern day dental practice the amount of pupil seeking dental treatment for aesthetic purpose has significantly increased. The various factors that might affect the smile are Missing teeth, Discoloration, malformed teeth, malaligned teeth, reverse smile line, excessive gum exposure of gums, improper occlusal plane[2] ultimately leading to an unpleasant and unsatisfied smile which might have a huge impact on a person’s confidence level. Fortunately, modern day dentistry provides a formidable solution for these clinical situations by means of customized smile makeover treatment plans.

The art of smile make over is dictated by the clinical situation with some clinical situation requiring a very minimal procedures while some other may demand a more comprehensive approach to achieve the desired result. An experienced, skilled dental practitioner will be able to provide the most conservative, less invasive procedures that, in combination, will yield the best possible results. With this objective, the treatment planning during smile make over aims for better predictability and support for the planned treatment. With the emergence of digital tools such as DSD software the former becomes more practically feasible. Digital Smile Design is a multiuse conceptual tool that offers the clinician a new avenue when combined with the 3D printing technique, facilitating and improving the communication among dentist, technician, and patient.[3,4] The combination of DSD and 3D printed model⁵ allows for improved esthetic manipulation, providing a better predictability to support the treatment plan. This case report enlightens about one such case report where a digital smile design software is used for a smile makeover procedure.

Case report: A male patient of age 27 years reported to Department of Prosthodontics, Menakshi Ammal Dental college with the chief complaint of spacing present in the upper front tooth region. On Clinical examination patient had midline diastema, malformed lateral incisors leading to an unsatisfied smile (Figure 1).
Diagnostic Impression and study models were made and after initial evaluation it was decided to design a smile make over procedure using DSD software and the restorative material of choice was Lithium di silicate laminate veneers (emax empress). The patient was explained about the DSD procedure and the treatment plan was framed accordingly. The work flow involved in DSD treatment are:

**Step-1: Extra Oral and Intra Oral Photograph:** The First step in the DSD protocol is the making of extra oral and intra oral photographs in different angles as shown in the (Fig.2) which is the most important step in digital smile designing.

**Step-2: Smile analysis:** Digital face bow analysis is done to evaluate the midline, cant in occlusal plane and smile analysis was done to evaluate the length, contour, size, shape of the teeth. On analysis it was found that the length of central and lateral incisors were short of the reference plane and also the mesiodistal width of the lateral incisors were less and hence that proportion has to be altered to attain a more esthetically pleasing smile.

**Step-3: Smile Simulation:** New Smile simulation was designed by increasing the length of central and lateral incisors and also the mesiodistal width of the lateral incisors.
Step 4: Digital model: The new simulated smile from the photograph is then transferred to the digital model.

Step 5: Fabrication of 3D printed model: A 3D printed model is then fabricated using the digital data which will facilitate in making the template for test drive.

Step 6: Test drive: A template was fabricated using Addition silicone impression material and test drive was done using Bis Acrylic composite resin and the patient was satisfied with the test drive and it was decided to restore both the central and lateral incisors (12, 11, 21, 22) with laminate veneers then the clinical procedures were performed.
Step-7: **Tooth preparation**: Teeth Preparation of 0.5 mm was done in the incisors for laminate veneers.

![Figure 8 Teeth preparation](image1)

Step-8: **Retraction & impression**

![Figure 9: Impression](image2)

Step 9: **Fabrication of E Max crown**: CAD CAM milled lithium disilicate (e Max) Veneers were fabricated based on the new digitalized smile design.

![Figure 10. Veneer fabrication](image3)

Step 10: **Veneer cementation**: The prepared teeth were initially etched with 37% phosphoric acid and the intaglio surface of the veneers were etched with 9% hydrofluoric acid for enhancing micro mechanical retention. Then the Cemenatation was done using dual Cure Resin cement.

![Figure 11. Etching of teeth surface](image4)
Discussion

Digital smile designing aids us in designing better smiles, effective treatment plan, increased perceived value and greater acceptance from patient. Patients usually have apprehension regarding the end result of smile design treatment. In these cases DSD is a boon and aids in motivation and education through the display of end result even before the start of treatment [5]. It acts as a technical tool used to design and modify the patient’s smile digitally and help them to visualize it beforehand by creating and presenting a digital mockup of their new smile design. It helps in visual communication and
involvement of patients in their own smile designing, thus ensuring predictable treatment outcome and increasing patient acceptance of treatment which in turn gives a higher level of confidence. [6,7,8]

In the present case report, a male patient walked into clinic with the complaint of midline diastema and malformed lateral incisors. The patient was explained about the DSD and the patient gave consent to the digital smile designing protocol due to the above advantages. The designing was performed in the exocad software and the major advantage was the 3D printed model, which gave a greater reliability to patient on the dentist and it was also useful for the test drive before the preparation and for temporisation.

The DSD was done after the essential photographs and the diagnostic impressions were made. These photographs were then fed into the software were the virtual facebow analysis was done which includes the analysis of occlusal plane, cant of the occlusal plane and midline. This was then followed by smile analysis were the tooth size, shape, contour, colour and smile line was assessed and the appropriate alterations required were done. In this case, the length of the central incisors were increased and the width and length of the lateral incisors were increased. This was simulated and the 3D model was printed with resin. Eventually, tooth preparation followed by impression making, ceraming procedures, etching protocol for tooth and veneers and finally the cementation was done. Lithium di silicate was preferred because of its excellent esthetic properties. [9]

Excellence can never be achieved by chance, but using a consistent systematic approach for diagnosis, communication, treatment planning and eventually execution yields a perfect result and satisfaction to the dentist and patient. Thus DSD is one such protocol aiding us in providing perfect and esthetic smile.

Conclusion

Digital smile design software not only serves as an aesthetic template but also, make the treatment phases more predictable for both patient and clinician, as the final design can be Visualised on the computer and be used by the patient during the Test drive Procedure. The Precise and proper application of DSD will enable us to create ideal and satisfying smile thereby enhancing the predictability of success in Smile Designing.

Source of Funding: Meenakshi Academy of Higher Education and Research, Chennai, India

Conflict of Interest: Nil

References
Can Dietary Instructions Delivered Through Mobile Application Reduce Sweet Score among Adolescents in Chennai, India?–A Randomized Controlled Preventive Trial

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Abstract

Background: Mobile health (mhealth) intervention has been proved to be effective in weight loss, diabetes control and tobacco cessation. Objective: To assess the effectiveness of mhealth intervention to reduce consumption of cariogenic diet. Design and setting: Randomized controlled trial in field setting. Materials and method: Forty two adolescents who were in the “Watch-out” zone of sweet score were recruited for the study. The subjects were randomly allotted into the test group (n=21) and the control group (n=21). A three day diet diary was recorded from all study subjects and the average sweet score was assessed at baseline and at post intervention. The subjects in the control group received standard one to one dietary instructions tailored to the needs of the subjects only once at the start of the study. Subjects in the test group received tailored dietary instructions once daily through mobile application (Whatsapp). Intra-group comparison was made using Wilcoxon signed rank test and inter-group comparison was made using Mann Whitney U test. P value <0.05 was considered statistically significant. Results: The sweet score for the control group at baseline was 20.9±6.06 while the post test score was 13.16±4.37 and the difference was statistically significant (p=0.002). The sweet score for the test group at baseline was 18.02±4.03 while the post test score was 14.5±7.74 and the difference was statistically significant (p=0.03). However, there was no statistically significant difference in sweet score between the two groups at the end of the trail. Conclusion: mhealth intervention is effective in reducing sweet score among adolescents.

Keywords: Mobile application, dietary instructions, cariogenic diet, sweet score.

Introduction

Non communicable diseases (NCDs) are the rising public health problem in the developing countries contributing to high morbidity and mortality rate. It is collectively responsible for almost 70% of all deaths worldwide. Low- and middle-income countries account for 3/4th of deaths due to NCD which includes nearly 80% of all premature deaths [¹]. Four major risk factors namely tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diet have been attributed for the rise in NCDs across the world. Increased consumption of food containing highly refined sugar is an important behavioral change which is implicated as a common risk factor for many NCDs like obesity, diabetes and dental caries. Hence, interventions targeting unhealthy diet containing high levels of refined sugar can help prevent these diseases/conditions.

Dental caries is the most common chronic condition of both childhood and adulthood affecting more than 2.4 billion adults and 621 million children worldwide [²]. It is the 10th most common disease affecting children.

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Untreated dental caries may cause sensitivity, pain, absenteeism from school and workplace, ultimately affecting the oral health related quality of life. Among 291 diseases investigated for causing disability, untreated dental caries was placed at 80th position [3].

Initiation and progression of dental caries can be prevented by limiting the exposure to cariogenic diet. Diet counselling and dietary instructions are hence advocated as a mainstay in the primary prevention of dental caries. Conventionally, diet instructions in diet counselling is delivered by trained personnel on a one on one basis through which consensus is reached between the counsellor and the subject on required dietary modifications to control dental caries. Despite being an effective tool for caries prevention, it is quite challenging to bring about dietary modification as it requires high level of motivation, and periodic reinforcement [4]. Hence, newer method of delivering dietary instruction which reinforce and motivate subjects on a regular basis might have higher success rate in bringing about the desired change in diet. One such recent technology to deliver health information is through mobile applications using smartphones, popularly referred to as mobile health interventions (mHealth intervention) [5].

Mobile health interventions have been proved to be effective in various health promotion programs involving, tobacco cessation, weight reduction and diabetes control[6-8]. Although many smartphone apps related to diet and nutrition are available, relatively few have been tested for their effectiveness in promoting health. There is an actual paucity in literature regarding the effectiveness of mobile technology based dietary instruction to reduce the intake of diet rich in highly refined sugar. Hence, a randomized controlled trial was conducted to evaluate the effectiveness of mobile technology based dietary instructions and to compare its effectiveness with standard one to one dietary instructions on reducing cariogenic diet rich in highly refined sugar among healthy adolescents in Chennai. The research hypothesis was that dietary instructions delivered through mobile application are as effective as dietary instruction by standard one to one method.

**Materials and Method**

A double blinded randomized controlled field trial employing concurrent parallel design was conducted among 18 years old apparently healthy college going adolescents. This trial conforms to the recommendations of CONSORT statement 2010 [9]. Prior to the start of the study, a detailed protocol was prepared which was scrutinized and ethical clearance was obtained from the Institutional Review Board bearing the reference number MADC/IRB-XIII/2017/287. No changes were made in the methodology after obtaining the ethical clearance.

A multiphase random sampling technique was employed to recruit the study subjects from a randomly selected Arts and Science College in Chennai city. In stage I, all students in the college (n = 946) were screened to identify subjects who have three or more carious lesions in their oral cavity using mouth mirror and dental explorer based on WHO criteria 2013 [10]. A total of 124 subjects had more than three active carious lesions. In phase II, the identified 124 subjects were asked to submit their 24 hour diet chart to assess their Sweet score based on Nizel and Papas criteria [11]. Subjects whose sweet score was ≥ 15 (Watch out zone) were identified. In stage III, 61 subjects in the Watch-out zone of sweet score were identified and were considered eligible for the dietary intervention. The study subjects were recruited between August and October 2018. The subjects were explained about the purpose of the study and informed voluntary written consent was obtained prior to the start of the study. Subjects who were active in using Whatsapp mobile application were eligible for the study. Subjects who have special dietary requirements were excluded from the study.

The sample size for the study was calculated by fixing alpha error at 5% and beta error at 20%. Expecting a difference of five units in the sweet score between the two groups, the sample size was estimated to be 15 subjects in each group. Expecting a drop rate of 30%, the sample size was increased to 21 subjects in each group. Forty two subjects were randomly selected from the list of 61 eligible subjects by simple random sampling using lottery method for the trial and randomized into the test group and the control group. A random allocation sequence was generated using the online randomization software (www.randomizer.org) using 1:1 ratio. The sequence was generated by an independent personnel not involved in the study (NJE). Based on the sequence, opaque envelopes were prepared, serially numbered and used for the allotting the subjects to the test group and the control group with 21 subjects in each group. The investigator who assessed the diet diary and the statistician who analysed the data were blinded to the intervention.
Baseline data on sweet score of the subjects was assessed by recording a diet chart. The subjects were given a three day diet diary and were instructed to enter details of all food items consumed, its quantity in household measurement, details regarding sugar added, and timing of intake. The primary outcome measure was the average sweet score which was calculated for each individual by summing up the sweet score for each day and dividing it by three. The sweet score for each food item containing sugar was allotted based on the Nizel and Papas criteria [11]. The diet diaries collected from the study subjects were coded to ensure blinding and was assessed by two authors (AKS and SS). The dietary instructions for each subject were tailored according to their needs based on the recommendations given by Nizel and Papas.

Subjects in the test group were sent dietary instructions which were tailored to their needs, on a daily basis through mobile application (Whatsapp). They were also sent motivational picture messages and were encouraged to clear their doubts about the dietary changes through messaging using the same application. Daily reminders like “Are you following the dietary instructions?” were also sent to the subjects in the test group. Subjects in the control group received standard one to one dietary instructions once at the beginning of the trial. The data as well as the one on one diet instructions for the control group were conducted at the college premises during the working hours. The subjects were given choices to have hot or cold beverages without sugar or if they found it difficult to have beverages without adding sugar they were asked to reduce the frequency of consuming the beverage or at least try to taper the number of times of beverage consumption. They were also instructed to avoid candies, carbonated drinks, ice-creams and biscuits and include snacks like popcorn, peanuts and sandwiches in their diet. At the end of 4 weeks, subjects in the test group and control group were asked to record a three day diet diary, using which the post intervention sweet score was calculated.

Data analysis was done per protocol. The data was entered in Microsoft Excel and analysed using SPSS version 19. Descriptive tables were made expressing quantitative variables in terms of mean and standard deviation. Normality of the data was assessed using Shapiro-Wilk test and was found to be non-normally distributed. Differences that existed between the intervention and control groups were tested for statistical significance using Mann-Whitney U test. Wilcoxon sign-rank test was used to compare difference between baseline and post-intervention sweet score in both control as well as the test group. P value < 0.05 was considered to be statistically significant.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Baseline sweet score</th>
<th>Post intervention sweet score</th>
<th>p value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>20.9±6.06</td>
<td>13.16±4.37</td>
<td>0.002</td>
</tr>
<tr>
<td>Test</td>
<td>18.02±4.03</td>
<td>14.5±7.74</td>
<td>0.03</td>
</tr>
<tr>
<td>p value†</td>
<td>0.08</td>
<td>0.77</td>
<td></td>
</tr>
</tbody>
</table>

* Wilcoxon signed rank test, † Mann Whitney U test

Results

A total of 42 subjects were randomly divided into test group and control group with 21 subjects in each group. Among the 21 subjects who received the assigned intervention in each group, totally 12 subjects were eliminated from data analysis either due to loss to follow up or due to incomplete data as shown in Figure 1. Thus the data obtained from 15 subjects were available in each for final data analysis. The mean age of the study subjects was 18±0.49 years and 80% (n=24) were females. The mean number of caries teeth of the study subjects was 3.83±0.28 and there was no significant difference between the test group and the control group. The mean sweet score in the control group was 20.9±6.06 at the baseline which reduced to 13.16±4.37 at the end of four weeks and this difference was statistically significant (p=0.002). In the test group the mean sweet score was 18.02±4.03 at baseline which reduced to 14.5±7.74 and this difference was statistically significant (p=0.03). Table 2 shows that the difference in
the mean percentage reduction in sweet score between the test group and the control group was not statistically significant. Among the 15 subjects in the control group who were in the Watch out zone at baseline, two subjects moved to the Excellent zone and three subjects moved to the Good zone of sweet score as per Nizel and Papas criteria. Similarly, among 15 subjects in the test group, four subjects moved to the Excellent zone and one subject moved to the Good zone of sweet score as per Nizel and Papas criteria.

Among the 15 subjects in the control group who were in the Watch out zone at baseline, two subjects moved to the Excellent zone and three subjects moved to the Good zone of sweet score as per Nizel and Papas criteria. Similarly, among 15 subjects in the test group, four subjects moved to the Excellent zone and one subject moved to the Good zone of sweet score as per Nizel and Papas criteria.

Table 2: Intergroup comparison of mean percentage reduction in sweet score before and after intervention

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean percentage reduction in sweet score</th>
<th>p value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>34.75±26.58</td>
<td>0.16</td>
</tr>
<tr>
<td>Test</td>
<td>22.35±31.00</td>
<td></td>
</tr>
</tbody>
</table>

*Mann Whitney U test

Discussion

The aim of the present study was to assess the effectiveness of mobile technology using Whatsapp to reduce the sweet score among adolescents. The results of this randomized controlled preventive trial showed that daily reminders sent to subjects’ mobile phone through Whatsapp mobile application was effective in reducing the Sweet score based on Nizel and Pappas criteria. mHealth interventions are consumer centered and assist the health care providers in delivering health education as well as patient management [12,13]. India, being the second highest mobile phone users in the world, the study result are of practical importance[14].

Adolescents were included in this trial as they have the ability to make informed decision and can process health information in an effective manner. By the time an individual reaches adolescence, he/she can exercise his preference over the diet and can opt for healthy dietary practices. Further in this study, adolescents were selected as they have access to smart phones and can comprehend the health information sent through Whatsapp.

Past dental caries is considered to be the best predictor of future dental caries [15,16]. Hence, subjects with at least three carious lesions were recruited in the present study as they can be considered high risk population for future dental caries and hence require diet counseling. Further, the subjects’ need for diet counseling was verified by collecting a one day diet chart. Only those who were in the Watch out zone of sweet score were recruited for the study. Multiphase random sampling method was employed in the study to facilitate the identification of eligible subjects in the study.

Whatsapp was preferred over short messaging services since the former had the facility to know whether the daily reminders have been sent and subsequently seen by the recipient. In Whatsapp mobile application, if a message has been sent successfully a single grey tick appears besides the message, and it turns to double grey ticks if the message has been successfully delivered to the recipient. The double grey ticks later turns blue once the recipient has seen the message. This in built check mechanism in Whatsapp helped the investigators to follow if the subjects read the daily reminders. Whatsapp was preferred over other messaging applications because it was a freely downloadable application which was highly popular among adolescents.

However, the results should be interpreted by keeping the limitations of the study in mind. Though the study was conducted for a short duration of four weeks, literature shows that many dietary intervention trials were conducted for such a duration. Although the study saw a high loss to follow up, we believe that the power of the study would not be affected as such a situation was anticipated and the sample size was adjusted accordingly at the start of the study. For the same reason, drop out analysis was also not carried out. There is also a possibility of hawthorne effect as well as social desirability bias might have crept into the study. Both the method of diet instruction namely the standard one on one counseling as well as the dietary instructions delivered through mobile application were effective in bringing about a significant reduction in the sweet score. This study was the first attempt to use mobile application to deliver dietary instructions to reduce the sweet score and hence direct comparison of the study results with previous literature could not be performed. The results of this study can be as the study followed rigorous methodology to select the study subjects in a random manner and the size of the sample was adequate despite the drop out Dietary instructions delivered through mobile application can be used in those instances where there are constraints of time and access to health professionals. This method can be considered cost effective method for delivering health information to a wide population given the high usage of smart phones among adolescents. The present study assessed the
short term effectiveness of the intervention in reducing the sweet score of adolescents. However, the long term impact of mobile application based intervention needs to be assessed in future.

**Conclusion**

It can be concluded that dietary instructions delivered through mobile application is effective in reducing the sweet score.

**Ethical Clearance:** Nil

**Source of Funding:** Meenakshi Academy of Higher Education and Research, Chennai, India

**Conflict of Interest:** Nil

**References**

Management of Skeletal Class-II Malocclusion Using Advansync 2: A Case Series

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Abstract

Angle’s class II division 1 malocclusion, being the most commonly occurring type of malocclusion, is challenging to treat especially when there is an underlying skeletal discrepancy. Various fixed functional appliances have been developed over the years by different authors for correction of skeletal class II malocclusion due to retrognathic mandible. Among the fixed functional appliances available for class II correction, Advansync2 (Ormco Co, Glendora, Calif) also known as molar to molar appliance has been used effectively in the recent past. It is a fixed tooth-born functional appliance with an advantage of allowing concurrent use of fixed orthodontic therapy. This facilitates reduction of the overall treatment duration. Two case reports of patients treated using the Advansync2 class II corrector has been presented along with the skeletal and dentoalveolar changes observed during the treatment. The effects observed were similar to most fixed functional appliances however the treatment duration was considerably reduced in all the cases.

Keywords: Class II, Advansync2, fixed functional appliance, cephalometrics.

Introduction:

Angle’s class II malocclusion is one of the most common problems affecting one third of the population and it has been a challenge for all the orthodontists owing to its difficulty in predicting its aetiology and its variable nature of representation[1]. In Indian population, orthodontists face a lot of class II div 1 cases mostly characterized by anteroposterior dental discrepancy which becomes severe when combined with an underlying skeletal disharmony. Although class II malocclusions can be associated with mandibular deficiency or maxillary protrusion or combination, a prevalence of 14.6% among 10 – 13 years is found for mandibular retrusion[2].

The treatment modality should consider factors such as aetiology, age of the patient, severity of malocclusion, growth status, patient compliance etc. for the proper selection of the appliance[2,3]. In growing population, Class II elastics or removable functional appliance are usually advocated for class II malocclusion. However, patient compliance becomes a major concern to employ these treatment modalities.

Fixed functional appliances were developed to bring the mandible forward regardless of patient compliance. Use of fixed functional appliance is an effective way to treat Class II malocclusion in post adolescent patients where the growth is mostly completed, thus dentoalveolar changes takes place predominantly rather than skeletal changes[4]. The Herbst appliance developed by H.Pancherz has been used routinely for nearly 40 years[5]. Over the years there have been many design variations developed by different authors in order to
increase the efficiency and reduce the patient discomfort during appliance wear.

AdvanSync2 is a fixed tooth borne functional appliance developed by Terry Dischinger in 2008. It facilitates functional therapy along with fixed mechanotherapy to reduce the treatment duration and also to improve compliance of the patient[6]. It supposedly gives greater skeletal change when compared to other similar fixed functional appliances.

Case 1:

Diagnosis and treatment plan:

A 15 year old female patient reported with a chief complaint of forwardly placed upper front teeth. She did not have any associated medical history and no associated habits. On extra-oral examination, she had a mesocephalic head type, mesomorphic body type with mesoprosopic facial pattern and an aesthetic built. Her profile examination revealed convex profile, posterior divergence, average nasolabial angle and average clinical FMA with a positive VTO (Figure 1A). On intra-oral examination, she had a bilateral class II molar and class II canine relationship with an increased overjet of 8mm and an overbite of 5mm. She had a tapered maxillary arch and ovoid mandibular arch with imbrications in lower anteriors. She had a decreased intercanine, interpremolar and intermolar width in the maxillary and mandibular arch (Figure 1B).

Cephalometric analysis revealed that the patient was in CVMI stage 3 which indicates that 25% - 65% of the growth was remaining (Figure 2A). According to Moyers
classification of skeletal malocclusion, the patient had a horizontal type F (mandibular retrognathism) pattern; Salzmann classification of skeletal class 2 division 1 and stage 8 of Fishman's classification (Figure 2B). She had anorthognathic maxilla and retrognathic mandible, with average mandibular plane angle and a decreased lower anterior facial height.

Pre-treatment orthopantomogram (OPG) revealed that the patient had full permanent dentition with no missing or supernumerary teeth (Figure 2C).

Based on the above findings, the patient was diagnosed with Angle’s class II div 1 malocclusion on a class II skeletal base with orthognathic maxilla and retrognathic mandible on an average mandibular plane angle with proclined upper and lower incisors with an increased overjet of 8 mm.

**Treatment Progress:** The advansync2 appliance was assembled initially (Figure 3) and activated for 3 mm thrice during the therapy. A full orthodontic appliance of 0.022 slot MBT system was bonded in the upper arch and the lower arch. Aligning and levelling was done sequentially with 0.016 NiTi and 16x22 NiTi. At the end of the fixed functional therapy, bilateral class I molar and class I canine was obtained (Figure 4). The archwires were in 17X25 NiTi at the end of the functional therapy.
Treatment Results: An overall increase in the maxillary inter-canine, inter-premolar and inter-molar widths of about 4mm was achieved at the end of the treatment. The post treatment photographs indicate that the patient had obtained a very pleasing smile with an ideal class I molar and class I canine relationship with an ideal overjet and overbite (Figure 5). The radiographs imply that an ideal crown and root inclinations and angulations have been obtained along with functional occlusion (Figure 6). The total duration of the treatment was 18 months. Beggs wrap around retainer was delivered for the upper arch and a bonded lingual retainer was fixed in the lower arch.
Case 2:

**Diagnosis and treatment plan:** A 12 year old male patient reported to the Department of Orthodontics and Dentofacial Orthopaedics with a chief complaint of forwardly placed upper front teeth. No history of medical illness or trauma was elicited from the patient. There was no association of any temporo-mandibular joint disorders and no associated habits. On extra-oral examination the patient exhibited hypodivergent growth pattern with mesocephalic head type, mesomorphic body type and mesoprosopic facial form. Upon examination of his profile, he had a convex profile with posterior divergence with average nasolabial angle on a low clinical FMA. He exhibited a positive VTO (Figure 7A).

On intra-oral examination, he had a bilateral end-on molar relationship with bilateral end-on canine relationship. He had an increased overjet of 10mm with increased overbite of 4mm. He had a tapered upper arch which was asymmetrical with spacing in relation to 12,13,14,22,23. He had a decreased inter-canine width with average inter-premolar and inter-molar width in the maxillary dental arch. His mandibular arch was
ovoid in shape with anterior crowding and decreased inter-canine, inter-premolar and inter-molar width (Figure 7B). On cephalometric analysis, the patient was in CVMI stage 3 which reveals that 25-65% of the growth was remaining (Figure 8A). According to Moyers classification of skeletal malocclusion, the patient had a horizontal type F (mandibular retrognathism) pattern and Salzmann classification of skeletal class 2 division 1. The patient was in stage 7 of fishman's classification (Figure 8B). The patient had orthognathic maxilla and retrognathic mandible with proclined upper and lower incisors. His lower anterior facial height was decreased. The upper posterior, lower anterior and lower posterior dentoalveolar height were also found to be reduced.

Figure 8: Pre-treatment radiographs A) Lateral cephalogram B) Hand wrist C) OPG

Pre-treatment orthopantomogram (OPG) revealed that the patient had full permanent dentition with no missing or supernumerary teeth (Figure 8C).

Based on the above findings, the patient was diagnosed as Angle’s class II Division 1 dentoalveolar malocclusion on a class II skeletal base attributing to an orthognathic maxilla and retrognathic mandible on a low mandibular plane angle with deep bite, rotated 16, 26, spacing in upper anteriors with crowding in lower anteriors, proclined upper and lower anteriors with increased overjet.

Treatment Progress: A full orthodontic appliance of 0.022 slot MBT system was bonded first in the upper arch and later in the lower arch. Aligning and levelling was done sequentially with 0.016 NiTi and 16x22 NiTi. After the completion of levelling and aligning, advansync2 appliance was assembled (Figure 9). The advansync2 appliance was activated for 3 mm thrice during the therapy. At the end of the fixed functional therapy, bilateral class I molar and class I canine was obtained (Figure 10 & 11). The archwires were in 19X25 NiTi at the end of the functional therapy.

Figure 9: Advansync2 Fixation
Treatment Results: The total duration of the treatment was 15 months. Post treatment photographs depicts the amount of intra oral and extra-oral changes obtained at the end of the treatment (Figure 12). The patient had obtained a pleasing smile and an esthetic soft tissue profile. The post treatment radiographs implies that an ideal inclination and angulation of the crown and root of all teeth have been obtained (Figure 13). There was an overall increase of about 3mm in the maxillary inter-canine, inter-premolar and inter-molar widths suggesting arch expansion. Beggs wrap around retainer was delivered for the upper arch and a bonded lingual retainer was fixed in the lower arch.
Discussion

Different treatment modalities have been developed for the treatment of class II malocclusions such as selective extractions, orthopaedic treatment using head gear or functional appliances, removable and fixed – inter or intra arch appliances and orthognathic surgeries. When the functional appliances are used during active growth periods (before or during puberty), they are intended to induce maximum skeletal growth. However, the amount of skeletal or dental change which will be obtained is difficult to quantify as it depends on various intrinsic and extrinsic factors.

Pangrazio et al stated that removable or fixed functional appliance bring about sagittal and vertical skeletal changes in the jaw positions resulting in orthopaedic and orthodontic changes[7]. Skeletal discrepancy correction during growth period can be achieved using removable as well as fixed functional appliance.

The AdvanSync2 appliance is a fixed functional appliance wherein there is no necessity to align and level the arches prior to the placement of the advansync2 appliance, so capitalizing on residual growth is possible, with favourable decrease in the treatment duration. It
is activated in increments until an edge to edge incisor relationship is attained as suggested by Dischinger[8]. The appliance can be removed after the overcorrection of sagittal discrepancy. As given by Jayachandran et al, Advan sync allowed for the simultaneous use of conventional edgewise appliance (0.022 x 0.028inch slots) [2]. It enhances the mandibular growth by constantly posturing the mandible forward upon closure through the telescoping mechanism.

The molar-to-molar attachment brings about intrusion of the molars and also mild proclination of the lower incisors. However, the amount of lower incisor proclination is lesser when compared to other fixed functional appliances where the attachment is fixed to the mandibular anterior segment thereby resulting in greater proclination of the lower anteriors. The direction of the forces generated by the advansync2 appliance includes sagittal, intrusive, and expansive vectors. The sagittal force vector has produced distal movement of the upper molars and also exerted an anterior force to the mandibular dentition and the mandible. Additionally, an intrusive force of the maxillary posterior region and mandibular anterior region was also evidenced. The push force generated by the appliance also leads to 2-3mm of expansion of the maxillary dental arch. This can be evidenced by the increase in the maxillary inter-canine, inter-premolar and the inter-molar widths in both our patients wherein there was an overall arch expansion of 3-4mm.

According to Ruf and Pancherz, Advan sync has produced significant mandibular growth changes in post pubertal patients, past their peak height velocities[9]. This can be evidenced by the post treatment cephalometric findings in both the patients. Al jewair et al stated that Advansync2 has a head gear like effect on maxillary molars and prevents their mesial movement which brings about class I molar relationship[6]. It also restraints the growth of maxilla which is beneficial in maxillary prognathic cases. This can be evidenced by the decrease in the 6 to ptv measurements on comparison of the pre-treatment and post-treatment cephalograms. Maxillary growth restriction with combination of mandibular molar mesialization and mild lower incisor proclination (IMPA-108°; 99°) with increase in FMA angle (25°; 28°) and lower anterior facial height (ANS-Gn – 58°; 62°) have also been evidenced [Table 1 and Table 2].

In cases having residual growth, alignment of the arches using stainless steel or TMA wire with incorporation of labial root torque prior to appliance placement will be beneficial and hence this has been done in case 2 to minimise the lower incisor proclination. Gandedkar and Celikoglu et al, suggested that lower incisor proclination, which is a drawback of advansync2 appliance can be corrected by fixed appliance with labial root torque, cinch backs and heavy stabilizing wires with miniscrew anchorage[10,11]. By employing labial root torque, reduced proclination of the lower anteriors had been encountered in our second case.

Dislodgement of the bands from the molars was encountered. The bulkiness of the molar bands was a disadvantage which could not resist the occlusal forces resulting in dislodgement. Hence, re-cementation of the bands had to be employed. Maxillary and mandibular molars were intruded due to the occlusal forces and the molar-to-molar attachment. This can be evidenced in the post functional cephalogram wherein there was a decrease in the FMA and lower anterior facial height. This had to be counteracted by extruding the molars during the finishing and settling stages. Some amount of spacing had also occurred in the maxillary arch during the treatment which could be attributed to the arch expansion. This was however controlled using stabilising wires and cinch backs.

According to Bock et al 2015, there was a good dentoskeletal stability for Class II correction using Herbst appliance[12]. According to Wigal et al, overcorrection using herbst appliance during early mixed dentition resulted in a significant reduction in overjet and correction of the molar relationship and also the correction was maintained after the fixed appliance therapy[13]. This was attributed to continuous restraint of the maxillary growth and the dentoalveolar adaptations. Since the advansync2 appliance is a miniaturised modification of the original Herbst appliance, the treatment stability can be expected to be the same.

Conclusion
The advansync2 appliance is an effective class II corrector producing an overall arch expansion of about 3-4mm in the maxillary dental arch. The FMA and the lower anterior facial height had reduced postfunctionally (case 1 - 23° and case 2 – 21°). However, due to the post functional extrusion of the molars, there was an increase in the FMA and the lower anterior facial height (case 1 – 28° and case 2 – 25°) at the end of the treatment. Use of fixed appliances with cinch backs and heavy stabilising
wires prior to appliance fixation had reduced the lower incisor proclination. This case series highlights the use of the Advansync2 appliance as an efficient fixed functional appliance producing clinically significant restriction of the maxillary arch (case 1 -3° and case 2 - 4° reduction in ANB) confirming a short term orthopedic effect on the maxilla. The total treatment duration was shortened to 15-18 months with simultaneous fixed appliance therapy.

**Ethical Clearance:** Nil

**Source of Funding:** Meenakshi Academy of Higher Education and Research, Chennai, India

**Conflict of Interest:** Nil

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Soft Tissue Expanders for Ridge Augmentation: A Review

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Abstract

Aesthetics in dentistry is one of the great concern for dental professionals as well as patients for maintenance of oral health. Missing tooth is the common esthetic problems in the patients which can be due to various periodontal or endodontic reasons. There are different treatment options available for replacing the missing tooth and the best alternative treatment is replacement using dental implants. Very often, placement of dental implants gets compromised when there is insufficient ridge or ridge defect. So when there is a ridge defect we need to definitely augment the ridge for the successful placement of dental implants. This article gives a short review about the tissue expanders used for ridge augmentation and their clinical efficiency of achieving a proper ridge morphology.

Keywords: Ridge Augmentation, Soft tissue Expanders, Implant.

Introduction

Missing tooth has become the common esthetic problem. Dental implant placement is one of the best treatment modalities. When there is ridge defect the placement of dental implant gets highly compromised. The correction of soft and hard tissue deficiency in such cases is a challenge for the clinician. Ongoing advances in periodontal surgeries permits the clinicians to reconstruct the insufficient soft tissue in alveolar edges with more unsurprising ways than already potential strategies. The deficiency of soft tissue in the alveolar ridge has been a challenge for the clinicians to achieve a proper augmentation outcome for patients with missing tooth.[1,2,3,4,5] This article is an overview of tissue expanders in a predictable augmentation of defective alveolar ridges.

Ridge Defects:

Alveolar ridge defects are classified into three types. They are:

1. Horizontal
2. Vertical
3. Combination

Different method to treat ridge defects have certain disadvantages such as flap transfer, color mismatch owing to different surgical site and loss of grafted bone. There is a new advanced alternative method namely soft tissue expander that holds an effective method to treat soft tissue deficiency.[6] The tissue expanders reduce morbidity of the donor site.

Horizontal ridge augmentation method:

1. Autogenous bone grafting
2. Allogogenous bone grafting
3. Ridge split technique

Vertical ridge augmentation method:

1. Guided bone regeneration (GBR)
2. Autologous local bone augmentation
3. Graft derived bone blocks
Soft tissue expanders for alveolar augmentation:

**History:** The tissue expansion method was first introduced by NEUMANN and it was used on the skin for ear reconstruction.[7] About 20 years later this tissue expansion method was developed by Austad and Rose in 1982; later Randovan et al developed self inflating tissue expanders. The self inflating tissue expanders require longer time to expand which is about to 8 to 14 weeks.[8]

**Forms of soft tissue expanders:** The tissue expanders exist in two forms; they are cylinder and cupola.

- In the straight edentulous region, the cylinder shaped tissue expander is normally used.
- And then in the curved frontal edentulous region, when one or more teeth is missing the cupola form of tissue expander is used.[10]

**Classification of soft tissue expanders:** Soft tissue expanders are of various types:

**Commercially available forms of tissue expanders:**[14]

1. Standard tissue expander
2. Custom-built expander
3. Differential expander
4. Anatomical expander

These tissue expanders are used in general medicine for various purposes like reconstruction of breast after mastectomy, ear and nose reconstruction surgeries, scar revision surgery, development of skin flap, skin pathology such as burns, vascular deformity, severe irregular scars and post-infection defects.

**Tissue expanders in dentistry:** In modern dentistry, various soft tissue expanders are being used in dentistry since 1990’s. The various commercially available expanders are as follows:

1. Osmed self-inflating tissue expander (Osmed GmbH, Germany):

   Mechanism: It is roofed by a perforated silicone shell to ensure the flow of body fluid. Continuous swelling of the expander occurs under a controlled condition.

   Special feature: The gradual increase in size and volume of the expander stimulates the growth of additional soft tissues.

2. Mentor tissue expander (Mentor Worldwide LLC, Minneapolis):

   **Mechanism:**
   - Dacron-reinforced base allows directional expansion by providing a solid platform.
   - Low risk of side-wall leakage due to its bottom-loading design.
   - Presence of remote injection dome.

   Special Features: Used in reconstruction of facial features like lips, nose and eyelids. Various shapes are available: round, rectangular, elliptical and crescent-shaped.

3. CUITM Brand Tissue Expander (Allergan, California)

   **Mechanism:**
   - Consists of a silicone elastomer envelope, a remote injection dome and a patented fill valve, which allows high rate of inter-operative inflation.
   - It is gradually inflated by injecting sterile saline solution at intervals until the required volume and size is obtained.

   **Special Features:** Temporarily used for the development of skin flap and reconstruction of a defect to provide adequate coverage of prosthesis.

**Osmed Self Inflating Tissue Expander:** Osmed self inflating tissue expander was introduced by Osmed in the year 1999. This expander was used as a new option for tissue expansion in dentistry. This osmotic expander is of second generation and it was first investigated in-vitro to determine the mechanical and swelling properties. Osmotic self inflating tissue expander is expanded because of absorption of body fluids and it is made up of solid material such as methyl methacrylate or vinyl pyrrolidone, hydrogel; these materials absorb the surrounding tissue fluid and it will increase in size over a period of 6-8weeks.[15,16]

**Method of Usage:** The osmotic self inflating tissue expander should be coated with silicone shell which has multiple perforations which allows the influx in tissue fluids. The speed of rate of influx in volume increases over time and it gets controlled by the number of perforations.[17] But the first generation of balloon expanders were not coated by silicone; these expanders get swollen slowly and continuously and the injection dependent peaks need to be avoided.
These expanders are available in various sizes of 0.24, 0.25, 0.7, 1.3 or 2.1ml. Surgical template should be used prior to the placement of the expander.\textsuperscript{[18]}

Initial incision performed, submucosal pouch prepared using scalpel and scissors without elevating the periosteum. Using surgical template expander, the size of the pouch should be controlled. The expander has to be placed into the submucosal pouch using bone fixation screw. The surgical area will be sutured with two-layered sutures using a fine monofilament suture material. Antibiotics (amoxicillin 750mg) should be administered one hour before surgery and prescribed for 7 days. The analgesics (ibuprofen 400mg) should also be given for 7 days. Patient has to come for a weekly follow-up and advised to use 0.2% chlorhexidine mouthwash for 2 weeks. After 6-8 weeks of expansion, soft tissue expansion will be achieved for ridge augmentation.\textsuperscript{[19]}

Mechanism: It is roofed by a perforated silicone shell to ensure the flow of body fluid. There is continuous swelling of the expander occur under a controlled condition.

**Advantages of soft tissue expanders:**

- Soft tissue expander is a simple surgical procedure; there is minimal infection and complication.\textsuperscript{[9]}
- Delayed action is there whereby swelling commences after a predetermined period of time.\textsuperscript{[10]}
- A precisely controlled expansion rate.
- Short surgical procedure, thus reducing post-operative pain.\textsuperscript{[11,12]}
- Low cost of surgery.

**Disadvantages of soft tissue expanders:**

- It can over expand,
- Possibility of infection, serum formation and tissue necrosis.
- Silicone bag may get perforated.
- Hypoxia may occur due to quick expansion.\textsuperscript{[12]}
- Vascularization of tissue is poor in the implantation site.\textsuperscript{[13]}

**Discussion**

“Creep” and mechanical and biological “stretch” are responsible for tissue expansion. This surgical tissue expander was historically invented by Neumann in 1957. It is scientifically proven from clinical studies that vertical ridge augmentation can be done using the principles of tissue expansion.

A second era osmotic expander was first examined in-vitro to decide mechanical and growing properties. The natural biologic properties of different soft tissue expansion, for example, skin or mucous layer, it responds to mechanical powers by tissue development bringing about cell proliferation.\textsuperscript{[20]} The hydrogel at expanders core is the result for mechanical properties of swelling and other parameters. Osmed self inflating tissue expanders, most normally utilized in dentistry was adequate to give a sufficient measure of soft tissue for ridge morphology. The requirement for external filling of body fluids is eliminated, which gives the low frequency of irresistible complexities by increasing the size by ingestion of body fluids.

In case reports, another expander used in specific is the intra-oral utilization of inflatable silicone balloon expander for bone graft surgeries. These expanders will be filled once in seven days by using injection and saline in subcutaneous infusion port until blanching appears in overlying tissues. Therefore this method is extremely technique sensitive and requires more surgical skills.

Also the supraperiosteal placement of hydrogel will prevent the significant resorption in the underlying bone which is seen with the subperiosteal expanders. And then the submucosal pouch is easily prepared. The swelling time is 60 days for hydrogels which is four times the silicone balloon and thus, this gives a prolonged discomfort to the patient. Also, slow and constant development will bring about protected and viable age of soft tissue with the osmotic expander.

The two significant histological changes happen during expansion are as follows: One is the fibrous capsule formation optional to an inordinate statement of collagen framework around implanted devices. A subsequent function happens at the bone surface, which fills in as a counter-bearing territory for the expansile pressure applied by expanders. Fibrous capsule formation is a complicated multifactorial process. Fibrous capsule formation is a muddled multifactorial cycle where the capsule severity has a positive direct relationship with the level of nearby inflammatory responses.\textsuperscript{[21]}

The vertical ridge augmentation in return will effectively prove the success rate for prosthetic rehabilitation of missing teeth and gives a high patient satisfaction.
Conclusion

Soft tissue expander is a simple surgical procedure which gives minimal complications and the incidence rate is low in graft exposition after augmentation surgery. Soft tissue expander using the osmotic tissue expander has more advantages over inflatable silicone balloons for vertical ridge augmentation. The tissue expander seems to be a more effective method in developing minimal amount of tissue after a surgical procedure. The soft tissue expander provides better and adequate tissue coverage and aesthetics. The use of soft tissue expander has started gaining more attention towards the surgical procedures, hence it has more advantages which can overcome the problem such as loss of bone graft and disclosure of bone graft. Based on the numerous responses from patients for esthetics, form and function, the tissue expander is expected to play an important part in intra-oral reconstruction in the future.

Ethical Clearance: Nil

Source of Funding: Meenakshi Academy of Higher Education and Research, Chennai, India.

Conflict of Interest: Nil

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Keratoameloblastoma of Oral Cavity: Report of Two Cases

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Abstract

Keratoameloblastoma is a rare variant and histologically heterogenous group of ameloblastomas, which have areas of ameloblastic epithelium and extensive keratin formation. Other subtypes of ameloblastoma which exhibit keratinisation in their parenchyma include acanthomatous ameloblastoma, and papilliferous keratoameloblastoma. Previously it was thought to be a variant of acanthomatous ameloblastoma with focal areas of keratinisation. Extensive keratin deposition in the connective tissue isolates keratoameloblastoma as a separate entity from acanthomatous ameloblastoma. The tumour presents itself as a destructive and an enlarging mass, mostly involving the posterior region of the mandible, with men being more commonly affected in the ratio of 3:1. This case report presents two cases of keratoameloblastoma, one in the posterior mandible and the other in the anterior maxillary region.

Keywords: Keratoameloblastoma, maxilla, mandible, oral cavity.

Introduction

Odontogenic tumours are the most common tumours of the head and neck region that occupy around 3%–9% of all biopsied specimens, and may arise from or associated with odontogenic apparatus, their derivatives or their remnants.[¹] Among the odontogenic tumours, ameloblastoma is considered to be the most common lesion next toodontoma in Asian population.[²]

Ameloblastoma is a true neoplasm of enamel organ type tissue, which is cytologically benign but clinically aggressive and destructive in its course. It is the most common odontogenic tumor of the jaw bones with various histologic sub-types; follicular and plexiform types being the basic histologic presentation.

Other histomorphic variations include acanthomatous, granular, basal cell, desmoplastic and hemangiomatous. Except the last two, the histological variation occurs in the epithelial component. Desmoplastic ameloblastoma does not exhibit the usual peripheral palisading and central stellate reticulum type cells in the epithelial islands. In contrast the epithelial islands appear compressed with the connective tissue stroma made up of hypocellular dense collagenous fibrous tissue with hyalinisation. Further, the distinct site of occurrence and radiographic appearance of this variant made it to be considered as a separate clinical type in World Health Organization (WHO) classification for odontogenic Tumour, in 2005, however it has been re-included as a histological subtype in 2017 classification.[³] In hemagiomatoustype the alteration is present only in the stroma by the presence of large, endothelial lined blood filled spaces. Amidst these variations, few of the subtypes exhibit keratinisation in their parenchyma, which include acanthomatous ameloblastoma, keratoameloblastoma and papilliferous keratoameloblastoma.[²,⁴]

Keratoameloblastoma is a term, which is used to describe a histologically heterogenous group of ameloblastomas, which have areas of ameloblastic
epithelium and extensive keratin formation.[4] Pindborg in 1970 described the tumour islands with papilliferous projections and keratinizing cysts as papilliferous keratoameloblastoma and the same type of tumour without papilliferous appearance was described by Altini as keratoameloblastoma. WHO in 1992, later considered this variant as acanthomatous ameloblastoma with areas of keratinisation.[4,5] Extensive keratin deposition in the connective tissue isolates keratoameloblastoma as a separate entity from acanthomatous ameloblastoma. Both keratoameloblastoma and papilliferous keratoameloblastoma are considered as extremely rare tumours with distinct histological features.[3]

Here we present two such cases of ameloblastoma with extensive keratinisation. Diagnosing these keratinising lesions and differentiating it from other keratin producing intraosseous neoplasms is a confrontable task and so are discussed in the light of this case report.

Case 1: A 74-year-old female patient reported with the complaint of swelling on her right lower jaw region for past 3 months; which was slow growing and was increasing in its size gradually over the period. The medical and familial history of the patient was non-contributory and there were no associated deleterious habits. Clinical examination revealed gross facial asymmetry with the swelling on right side of the body of mandible extending from the commissure of lip till the angle region. [Fig.1] The surface of the swelling appeared smooth with no evidence of sinus or discharge extra-orally. The lymph nodes were not palpable and the swelling was not associated with pain or paresthesia. Intra orally, the lesion was smooth, extending from the edentulous area of 45 to 48 region, with no surface ulceration. Orthopantamograph revealed a multilocular radiolucent lesion occupying the right body of the mandible, extending from 45 to 48 region. CBCT showed bi-cortical expansion of the right side mandible and erosion on the lingual and inferior surfaces. [Fig.2A, B&C] Fine needle aspiration was performed and no cystic fluid obtained from the swelling. Based on the history, clinical and radiographical features, a provisional diagnosis of benign odontogenic tumour was made with the differential diagnosis of ossifying fibroma. Incisional biopsy was performed and the specimen was sent for histopathological examination.

Fig.1: Swelling on right side of the body of mandible

Fig.2A: OPG revealing multilocular radiolucent lesion occupying the right body of the mandible. 2B & 2C: CBCT showing bi-cortical expansion of the right side mandible
Grossing showed three greyish white soft tissue specimen, which were firm in consistency. Histopathological examination of the H&E stained sections revealed an encapsulated lesion with dense connective tissue stroma. Numerous proliferating odontogenic islands in the form of follicular and plexiform pattern were noted. Most of these epithelial islands show extensive keratin occupying the entire follicle. Few islands showed straggling extension into the connective tissue giving a stretched-out appearance of the follicles at the extremities. [Fig.3A]

![Fig. 3A: Keratin filled follicles with stretched-out appearance at the extremities. 3B: Areas of metaplastic bone formation representing osteoplasia](image)

There were also areas of keratin in the connective tissue extruded from the epithelial islands. These keratin were arranged in a lamellar pattern, giving a ‘pacinian-like stack of lamellated parakeratin’ appearance. Few areas of keratin filled cystic spaces were also evident. The connective tissue was fibrous with a very minimal inflammatory component. Areas of metaplastic bone formation were also evident representing osteoplasia. [Fig.3B] Based on these histologic features, a final diagnosis of keratoameloblastoma was made.

Segmental resection of right side of the body mandible was performed and the entire tumour was removed in toto. A bone clearance of 8mm was given both the sides to prevent recurrence. Only a reconstruction titanium plate (2.5mm) was placed as a reconstructive option as the patient had medical co-morbidities as contraindication for major bone flap reconstruction. A six month review showed no relapse and patient was kept on review for future reconstruction. [Fig.4A&B]

![Fig.4A: Segmental resection of right side of the body mandible. 4B: Placement of reconstruction titanium plate](image)
The excised specimen had a gritty texture when cut during grossing. Histological features of the excised specimen were in confirmatory with the previous diagnosis of keratomeloblastoma.

**Case 2:** A 42-year-old male patient reported with a complaint of slowly expanding painless swelling on the right upper front tooth region. The size of swelling increased gradually to attain the size of $4 \times 4 \text{ cm}^2$ within three months. Intra orally the swelling has expansion more towards the buccal side in relation to 11 to 15 region, extending up to the buccal vestibule, whereas the palatal expansion was very minimal. The swelling was hard on palpation with ill-defined margins. Radiograph revealed mixed radioopacities and radiolucencies with loculations. Together with clinical and radiological features, a provisional diagnosis of benign odontogenic tumour was made. Incisional biopsy was performed and the specimen was sent for histopathological examination.

![Fig.5A Ameloblastic island containing central stellate reticulum like cells 5B: Squamous cells replacing the central stellate reticulum like cells](image1)

![Fig.6: Extrusion of keratin outside the island, resembling shredded carrots](image2)

![Fig.7: ‘Pacinian- like stack of lamellatedparakeratin’ appearance](image3)
Microscopic examination of H and E stained sections revealed strands of odontogenic epithelium interspersed in the connective tissue stroma in the form of small islands and cords. The peripheral cells of the epithelial islands are made up of hyperchromatic, palisading columnar cells with reversal of nuclear polarity. Stellate reticulum like cells are present in the center of these islands. [Fig.5A] In few islands, the central stellate reticulum like cells are replaced by squamous cells. [Fig.5B] The connective tissue stroma was moderately vascular with thick irregularly arranged collagen fibres exhibiting desmoplasia. Further focal areas showed multiple large and small cystic spaces, lined by low columnar to flat cells, with central squamoid island containing eosinophilic, acellular discrete strands/bands of keratin. [Fig.6] Extrusion of keratin outside the island, resembling shredded carrots or lamellar pattern, giving a ‘pacinian- like stack of lamellatedparakeratin’ appearance was striking. [Fig.7] All the above histological findings suggested the diagnosis of keratoameloblastoma. Radical excision of the tumour was done and the histopathological examination of the excised specimen revealed features similar to the preoperative specimen and confirmatory to that of the preoperative histological diagnosis.

Discussion

Ameloblastoma is a highly polymorphic benign neoplasm of odontogenic origin, with its few variant undergoing different forms of metaplasia. This kind of metaplastic change can be attributed to the multipotentiality of the odontogenic epithelium. Robinson defined ameloblastoma as unicentric, nonfunctional, intermittent in growth, anatomically benign and clinically persistent. Its benign nature, grotesque size, locally invasive behaviour, and common occurrence make the lesion distinct from other odontogenic tumours.

Pindborg in 1970 first proposed the term Keratoameloblastoma (KA) and later WHO (1992) defined KA as an ameloblastoma with extensive keratinisation. However, WHO in 2005 classification for odontogenic tumours has not mentioned this term but considered this lesion as a variant of acanthomatousameloablastoma with focal keratinisation. The reason for keratoameloblastoma, failed to get placed in the WHO classification of odontogenic tumors, could be due to the lack of adequate number of case reports and no different biological behaviour from conventional ameloblastomas. Pindborg also noted few cystic areas with some papilliferous appearance of odontogenic islands and named it as papilliferouskeratoameloblastoma (PKA). Some authors consider PKA as a sub-type of KA; however, both are considered as rare variants of ameloblastoma.

There are about 19 cases of KA, which have been reported till date in the English literature. In general, KA, shows similar demographic distribution like conventional ameloblastoma in terms of age, sex and site. The age group ranges from 26 to 76 years with 44 years as a mean age, with men being more commonly affected in the ratio of 3:1.

The tumour presents itself as a destructive and an enlarging mass, mostly involving the posterior region of the mandible including body and ramus, followed by posterior maxilla, anterior mandible and maxilla being the least. All the cases reported in the literature are intra-osseous with a very few report on its peripheral variant. Radiographically, it presents as a radiolucent lesion with marginal erosion and perforation of the cortical plates as is seen in the present case.

The varied histomorphology of KA, makes the lesion unique and enabled to categorise it histologically into four subtypes by Whitt, namely:

(i) Papilliferous histology: odontogenic epithelium shows papillary projections into the cystic spaces

(ii) Simple histology: odontogenic follicles are filled with parakeratin or ortho-keratin and lined by ameloblast-like cells showing reversal of polarity

(iii) Simple histology with KCOT(Kerato Cystic Odontogenic Tumour)-like features: shows similar features of simple type, in addition it contains features of conventional KCOT (however, in 2017 WHO Classification it was reverted back to cyst category).

(iv) Complex histology: consists of epithelial follicles packed with parakeratin or orthokeratin, extrusion of keratin masses into connective tissue stroma in the form of “Pacinian-like stacks” with or without foreign body reaction.

Histopathological features in both the cases reveal a complex histology as there were numerous odontogenic epithelial islands arranged in the form of follicles, lined by hyperchromatic, palisading columnar cells with reversal of nuclear polarity, with the presence of
stellate reticulum like cells in the center of these islands. Extensive keratin formation were noticed in most of the islands. The stroma appears highly collagenous, exhibiting marked desmoplasia. Areas of extruded keratin into the connective tissue were also seen, giving a ‘pacinian- like stack of lamellatedparakeratin’ appearance. Focal areas of large and small cystic spaces lined by low columnar cells with multiple clusters of mucous cells were also noticed. Few of the islands were not characteristically lined by odontogenic epithelial cells showing reversal of polarity validating the fact that few cases reported in the literature lack convincing histological evidence of typical ameloblastoma.

Metaplastic bone formation, termed as osteoplasia, was also noticed within the collagenized fibrous connective tissue stroma. A number of immunohistochemical (IHC) markers used for ameloblastoma, include CK 5/6, CK 13, CK 14 and CK 19. Each of these markers’ expression vary according to stages of tooth germ development and subtypes of the tumour. Usually, CK13 is expressed in the stellate reticulum- like cells; CK 14 in the peripheral cells and CK 19 in all the cells of solid/multicystic and unicysticameloblastomas including acanthomatous and granular variant. This kind of expression does not hold the same for few variants like desmoplastic and peripheral ameloblastoma. Contrary to this view, the pattern of IHC expression was altered in the present case that the epithelial cells were not expressed by CK 14 and CK 19 markers. This negative expression suggests that origin of this tumour could even be in a very primitive stage of ameloblasts and need not be essentially in a later stage for its development. Molecular markers related to enamel proteins and transcription factors can be used to express these odontogenic epithelial cells in such scenario.

Keratinisation in amelolastoma can be attributed to any of the following. It can evolve as a squamous metaplastic change in the central stellate reticulum–like cells in the ameloblastic follicles, as in acanthomatous variant; or can arisen from keratinising ameloblastoma; or due to ameloblastomatous transformation in the pre-exiting KCOT. The present case does not exhibit KCOT like areas, and so, the cause for keratinisation can be due to acanthomatousameloblastoma or de novo. However, straggling extension of the epithelial islands at the extremities, blending with the highly fibrous connective tissue, along with few areas of osteoplasia, triggers a thought of KA as a sequela or the later stage of desmoplastic ameloblastoma or a hybrid variant.

Differentiating KA from other keratin producing intraosseous neoplasms (KPIOns) is a requisite at this juncture for a fitting diagnosis. The most debatable acanthomatousameloblastoma can be distinguished from KA by the presence of keratin within the follicles in acanthomatousameloblastoma, whereas, there will be extrusion of keratin into connective tissue stroma in KA. Absence of stromal keratinisation, classic tall columnar cells with reversal of nuclear polarityand stellate reticulum like cells draws out solid variant of keratocystic odontogenic tumor (SKCOT) from the spectrum of diagnosing KA. Primary intraosseous carcinoma (PIOC) is also a keratinising malignant neoplasm of jaw bones. Absence of connection with the oral mucosa and presence of varying dysplastic features distinguishes PIOC from KA.

Treatment modality include wider excision and segmental resection of the affected bone combined with post-treatment follow-up. Aggressive surgical resection along with 10 mm clearance may be necessary to prevent recurrence and reconstruction need diligent planning as the affected patients are usually of an older age. Recurrence is noted in a very minimal number of cases. The biological behaviour and prognosis of this lesion compared to other histological variants of ameloblastoma cannot be ascertained due to the limited number of cases and meagre follow-up.

Keratoameloblastoma is a rare variant of conventional ameloblastoma and its biological behaviour is poorly understood. Having only a handful of cases in the literature, it requires strenuous learning for the pathologists to know its origin, course and recurrence. These kind of subtypes adds significance for academic interest but a knowledge of how these subtypes influence the nature of the tumor is a must requisite.

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Conflict of Interest: Nil

References


Anthropometric Measurement Changes in Orthodontic and Orthognathic Surgery Patients in Dravidian Population: A Photographic Retrospective Study

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Abstract

Introduction: To evaluate the anthropometric and divine proportion measurements using pre and post-treatment photographs in patients subjected to only orthodontic treatment and orthodontics with orthognathic surgery.

Materials and Method: The sample size was calculated with a power value of 95% which yielded a sample size of 126 patients. The pre and post photographs of these patients were divided into two groups namely Group I where patients treated only with orthodontics (64 patients) and Group II where patients were treated by both orthodontics and orthognathic surgery (52 patients). The Standard Anthropometric facial proportions and divine proportion measurements were used to digitally assess the pre and post-treatment facial changes using Ilexis FACAD software (Version 3.8.00). These photographs were standardized with the help of interpupillary line measurement which was done on both digital photographs and clinically and correlated.

Results: Group I showed statistical significance (P<0.005) with upper lip length, lower lip length, upper lip, and lower lip vermillion changes whereas Group II subjects showed statistical significance in Skeletal vertical changes. The lower facial height, lower lip length was significant in Class II orthognathic patients whereas the upper facial height, alar basal width, and mouth width showed significant differences (P<0.005) in Class III orthognathic patients.

Conclusion: Significant changes were noticed in both groups when pre and post-treatment values were compared, but orthognathic subjects comparatively showed higher significance values in vertical parameters which were near to the ideal anthropometric values and divine proportion ratios.

Keywords: Anthropometrics, Photographic analysis, divine proportions and Orthognathicsurgery.

Introduction

Facial beauty and physical Esthetics has a strong emphasis on modern social society and individual well-being. The 18th-century philosopher Alexander Baumgarten, who established esthetics as a distinct field of philosophy, coined the term, which is derived from the Greek word for sensory perception (aisthesis) [¹]. Aesthetics play a major role in day to day life of the people for overall social and personal happiness. Even though tastes, fashion, and standards of beauty change from time to time, there appears to be certain facial proportions and relationships that provide a basis for the diagnosis and planning for improvement of facial form.

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e-mail: hemanthapparao@yahoo.com
Many authors over the years tried quantifying facial beauty and physical attractiveness, among which Ricketts\(^2\) gave “golden proportions” through a mathematical proportion of Fibonacci series and Farkas\(^3\) introduced “Anthropometric measurements” based on the extensive technical study of face and head measurements in accordance to age, sex, and ethnic origin. And these indices are referred to quantify and qualify the term overall aesthetics of the face.

In today’s society esthetics play an overwhelming role in a variety of media. The facial standards of esthetics bring the perception of beauty and social acceptance \(^4\). In recent times, patients seek treatment with the most common motive being the enhancement of facial beauty through orthodontic and orthognathic procedures.

The present study aimed to compute the facial esthetics using two-dimensional photographs through anthropometric measurements and divine proportions in patients who underwent orthodontic treatment only compared with patients who underwent Orthodontic and Orthognathic surgical treatment. This comparison adds insight to the present literature based on the dramatic changes that can be achieved through Orthodontic and Orthognathic treatment modalities respectively.

The study also aimed to perceive whether the post orthodontic or post orthognathic facial measurements obtained, were near to the ideal anthropometric measurements and divine proportions. The null hypothesis states that there are no changes in the anthropometric measurements when patients are subjected to orthodontic or orthognathic surgery protocols.

**Materials and Method**

This prospective study was conducted by evaluating records of patients who underwent Orthodontic treatment only and Orthodontic combined with Orthognathic treatment in the Department of Orthodontics and Dentofacial Orthopaedics at our center.

The inclusion criteria for the Orthodontic treatment group (Group I) were patients with dentoalveolar Class I bimaxillary protrusion, dentoalveolar Class II division 1 with an overjet of less than 7 mm, dentoalveolar Class II division 2, and dentoalveolar Class III with an edge to edge incisal relationship. The Orthognathic surgical Group (Group II) comprised of patients who presented with Skeletal Class II division 1 (Sub-group A) with overjet greater than 7 mm (ANB≥6°) and Skeletal Class III (Sub-group B) with ANB≤-1°.

Patients with gross facial asymmetry, craniofacial deformity, systemic illness, improper records, cleft lip and cleft palate, and patients who required re-treatment and those under treatment progress were excluded from the study.

Based on the power factor of about 95% the sample size calculated was 128 patients.

The Pre and Post-treatment Frontal view photographs of 116 Patients were collected from the archives in our center over a period of 15 years, of which 64 were in group I (Orthodontics only) and 52 were in group II (Orthodontics and Orthognathic surgery) as only 52 patients records were retrievable. The sample size was kept to 116 patients as we narrowed it to only the Dravidian population who underwent orthodontic treatment and orthodontic combined with orthognathic surgery exclusively in our center. The subjects who underwent orthodontic therapy were randomly selected relative to the other group. The patient’s age ranged from 13 to 35 years (Mean -25.1yrs). Pre-treatment and Post-treatment photographs were obtained using a Digital camera (Nikon D3200, Japan) fitted with a Ring Flash (Nissin MF18) onto a tripod stand with the object to operator’s distance measuring to 5 feet 8 and a standardized zoom of 105 mm. The sample allocation was done on a randomized method in individual groups.

A Digital Photographic album was created for both the groups and each album consisted of Pre and Post-treatment photographs which were paired and were placed in a random sequence and assessed for change in proportions.

The images were imported into the computerized software (FACAD AB-2014 software, Version 3.8.0.0, Sweden) by a single operator. The standardization and calibration of the photographs were done by correlating the digitized inter-pupillary measurement from the photographs with the clinical measurement of inter-pupillary width in patients. The inter-pupillary distance was used as a stable facial reference as it is not subjected to any change after the age of 11 years for girls and 15 years for boys.\(^7\) The Inter-pupillary width was calculated, from the mid-point of the pupil of each eye or mid-point of each orbit on either side.\(^9\)

Twenty-seven parameters of the Anthropometric
proportion5 were used for the analysis (Table I, Table II, Table III) since the software which was employed for this study could digitize parameters that were in the 2D frontal view. Using the analysis, 116 patient’s pre and post-treatment facial proportional changes were measured and evaluated.

**Statistical Analysis:** The results are statistically analysed and tabulated using SPSS software (produced by SPSS Inc software house in Delaware and incorporated into IBM in 2010, United States of America). The unpaired student ‘t’ test was used to compare the data between the groups and the paired student t-test was used within the groups.

**Results**

The Tables (Tables I and II) demonstrates the mean, standard deviation, and mean differences, as well as the comparison of the variables between pre and post-treatment values of both Orthodontic and Orthognathic groups of patients. The Anthropometric measurements of pre-treatment values when compared to post-treatment values demonstrated significant differences in almost all parameters of the craniofacial region.

The parameters concerning the mouth width, upper and lower lip lengths, upper and lower vermillion heights, mandible ratio, mandible face height ratios showed statistical significance in the orthodontic group (p ≤0.005).

The measurements concerning facial height, lower face height, upper and lower lip lengths, lower lip vermillion, mandible to face height ratio showed statistical significance (p ≤0.005) in Class II skeletal patients (Group II A).

In Class III skeletal patients (Group II B) the parameters concerning facial height, upper facial height, lower lip length, upper and lower lip vermillion, facial index, mandible width- facial height ratio, mandible-lower facial height ratio, and chin-mandible face index showed statistical significance (p ≤0.005).

Regarding divine proportions, the parameters that showed statistical significance are alae width-mouth width ratio and upper lip length to lower lip length ratio in Group I.

In the Orthognathic subgroup (Group II A), forehead to eye and eye to menton ratio, upper lip length, and lower lip length ratios showed statistical significance (p ≤0.005) whereas in the Orthognathic subgroup (Group II B) all the vertical divine proportions showed statistical significance (p ≤0.005) as shown in Table 2.
<table>
<thead>
<tr>
<th>S.No</th>
<th>Parameter</th>
<th>Ideal values</th>
<th>Group I Orthodontic patients (mm)</th>
<th>Group II Orthognathic Class II patients (mm)</th>
<th>Group II Orthognathic Class III patients (mm)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pre Rx values with SD</td>
<td>Post Rx values with SD</td>
<td>Pre values with SD</td>
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<td>Pupil mid face width</td>
<td>33-31</td>
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<td>60.09(8.10)</td>
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<td>Intercanthel width</td>
<td>33-32</td>
<td>34.66(4.69)</td>
<td>34.52(4.63)</td>
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<td>4</td>
<td>Gonial width</td>
<td>91-97</td>
<td>108.07(15.31)</td>
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<td>5</td>
<td>Nasal base width</td>
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<td>Mouth width</td>
<td>53 – 50</td>
<td>41.02(6.14)</td>
<td>42.80(5.95)</td>
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<td>Facial height</td>
<td>121 - 112</td>
<td>116.87(16.73)</td>
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<td>Upper face height</td>
<td>66 – 72</td>
<td>60.24(8.98)</td>
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<td>9</td>
<td>Lower face height</td>
<td>58-66</td>
<td>56.22(9.55)</td>
<td>55.90(9.77)</td>
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<td>Upper lip length</td>
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<td>Lower lip length</td>
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<td>12</td>
<td>Upper lip vermillion</td>
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<td>Mandible face width</td>
<td>70.8 - 70.1</td>
<td>102.09(13.63)</td>
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<td>16</td>
<td>Upper face</td>
<td>52.4 - 54.0</td>
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<td>Mandible</td>
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<td>41.2-40.4</td>
<td>26.03(5.06)</td>
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<td>.000</td>
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<td>Mandible upper facial height</td>
<td>67.7 – 66.5</td>
<td>31.07(4.24)</td>
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<td>.317</td>
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<td>Mandible lower facial height</td>
<td>69.6 – 69.1</td>
<td>64.03(8.26)</td>
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<td>.887</td>
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<td>Chin mandible face Index</td>
<td>25.0 – 25.4</td>
<td>67.56(3.99)</td>
<td>64.60(3.15)</td>
<td>.216</td>
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Table 2: Divine proportions before and after treatment in all the sample groups (transverse measurement)

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<th>S.No</th>
<th>Parameters</th>
<th>Group I Orthodontic patients</th>
<th>Group II Orthognathic Class II patients</th>
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<tr>
<td></td>
<td></td>
<td>Pre value’s with SD Post’ value’s with SD Statistical significance</td>
<td>Pre value’s with SD Post’ value’s with SD Statistical significance</td>
<td>Pre value’s with SD Post’ value’s with SD Statistical significance</td>
</tr>
<tr>
<td>1</td>
<td>Lateral Canthus of eye to Soft Tissue Temporal</td>
<td>70.66(5.37) 69.48(5.73) .031</td>
<td>70.32(8.69) 70.68(9.48) .857</td>
<td>65.65(4.8) 66.62(3.03) .463</td>
</tr>
<tr>
<td>2</td>
<td>Alae Width to Mouth width</td>
<td>75.06(7.81) 72.02(8.73) .001</td>
<td>75.69(9.15) 74.35(6.10) .493</td>
<td>73.29(7.45) 85.87(6.91) .234</td>
</tr>
<tr>
<td>3</td>
<td>Eye Width to Mouth Width</td>
<td>144.48(19.10) 139.43(12.03) .022</td>
<td>180.24(11.89) 136.95(12.37) .280</td>
<td>138.88(12.70) 138.95(11.94) .342</td>
</tr>
</tbody>
</table>

Trasverse measurements of divine proportions unit % (p<0.005)

Table 3: Divine proportions measurements before and after treatment in all the sample groups (vertical measurement)

<table>
<thead>
<tr>
<th>S.No</th>
<th>Parameters</th>
<th>Group I Orthodontic patients</th>
<th>Group II Orthognathic Class II patients</th>
<th>Group II Orthognathic Class III patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre value’s with SD Post’ value’s with SD Statistical significance</td>
<td>Pre value’s with SD Post’ value’s with SD Statistical significance</td>
<td>Pre value’s with SD Post’ value’s with SD Statistical significance</td>
</tr>
<tr>
<td>1</td>
<td>Forehead to eye and eye to menton</td>
<td>71.40(12.45): 100.47(15.27)</td>
<td>71.81(11.90): 100.06(15.58) .540: .466</td>
<td>73.56(8.99): 99.99(17.98) .114: .004</td>
</tr>
<tr>
<td>3</td>
<td>Mouth to Menton and Mouth to eye</td>
<td>41.24(8.93): 59.65(8.95)</td>
<td>39.57(8.10): 60.49(8.40) .026: .109</td>
<td>39.37(5.57): 63.36(8.80) .660: .448</td>
</tr>
</tbody>
</table>

Vertical measurements: unit ratio mm (p<0.005)
Figure 1: Landmarks (TRI – trichon, TSR – Temporal right, TSL – Temporal left, N- nasion, LC – Midpoint of the line drawn from lateral canthus of the eye, PuR- interpupillary right, PuL – interpupillary left, IcR – inner canthus of the eye right, IcL- inner canthus of the left, LcR- lateral canthus right, LcL- lateral canthus left, ZyR- zygomatic right, ZyL- zygomatic left, Nbr- Nasal base right, Nbl-Nasal base left, AL- alae of the nose, Sn- Subnasale, Sto – stomium, Sts – stomion superior, Sti- stomion inferior, Li- Labiale superior, Li- labiale inferior, ComR- Commissure right, ComL- commissure left, Sl – sublabial, Gn – gnathion, Me-Menton, GoR- gonial right, GoL- Gonial left.

Figure 2a: Sample of Orthodontic group patients(pre)
Figure 2b: Sample of Orthodontic group patients (post)

Figure 3a: Sample of Orthognathic (Skeletal Class III) group patients (pre)

Figure 3b: Sample of Orthognathic (Skeletal Class III) group patients (post)

Figure 4a: Sample of Orthognathic (Skeletal Class II) group patients (pre)
Discussion

The present study aimed to observe the changes in anthropometric measurements post orthodontic and post orthognathic surgery in the Dravidian population. This study also attempted to discuss the proportion achieved after the treatment was nearest to the ratio of indices of golden (divine) proportion (0.62)\(^2\). Considering this, the changes that were observed in the orthodontic, as well as an orthognathic group, resulted in both ratio and percentage format where the value of ratios are represented by a mathematical assumption of 0.6:1. According to rickets et al, the ratio of 0.6:1 symbolizes the golden proportion which the standard for an aesthetically attractive profile. The maximum changes in the anthropometric parameter were observed in an orthodontic group, statistical significance was upper lip length, lower lip length, upper vermillion show, lower vermillion which was in concordance with a study done by Benedito V. Freitas et al\(^{17}\).

In the orthodontic group, divine proportion ratio\(^2\) changes are evident in alae width and mouth width caused due to the reduction in proclination of the anterior teeth which bring the value closer to the divine proportion ratio (0.6). The other parameter that showed
significant alteration is the ratio of the upper lip to lower lip length. This change was attributed to the proclination and bite correction which in turn increases the lip length thus bringing it closer to the value of pi or golden proportion. According to Jovana Milutinović, lower facial parameters were approaching the set of divine proportions which is per this study.

In the present study when the Class II orthognathic group was considered, the changes in the chin and convexity were improved due to surgery. The other noticeable changes observed were an increase in total facial height, Lower Face height, upper lip length, lower lip length, and lower vermillion show. These changes were attributed to the advancement of the mandible in a downward and forward direction achieved by Bilateral Sagittal Split Osteotomy (BSSO) which led to a better facial profile and bringing these parameters closer to the ideal value of anthropometric measurements. Whereas, the increase in upper lip length is attributed to a reduction in proclination of the upper anterior teeth. which is in accordance with Silvia Augusta Braga Reis et al who stated that facial profile convexity and chin prominence are the most important factors which influence facial attractiveness.

In Class II orthognathic patients, the changes in divine proportions were evident in the eye to menton which is a vertical parameter brought about by the BSSO procedure. This is because the mandible is displaced forward owing to the increase in lower face vertical height thus changing the ratio of the eye to menton and forehead to eye achieving a divine proportion. These changes that are observed in the orthognathic group are also in concurrence with the study reported by Siamak Hemmatpour. Also the upper lip length and lower lip length ratios were altered due to an increase in lower face height by mandibular advancement that caused a stretch in the soft tissue drape of the lower face thus establishing golden proportion ratio of 0.6:1.

In class III orthognathic patients, the changes in Anthropometric measurements were evident in total facial height, upper face height, lower lip length, upper vermillion show, lower vermillion show. These apparent changes were attributed to the downward and forward movement of the Maxilla through Lefort I osteotomy in combination with an upward and backward displacement of the Mandible due to Mandibular set back (BSSO). The combination or single jaw surgery may vary based on the malocclusion and deformities of the individual’s deficiencies where the facial heights are altered. This profile improvement gives the patient a good facial appearance and also brings the linear and angular measurements of the patient’s facial landmarks closer to that of Anthropometric measurements.

The Indices and ratios in Class III orthognathic patients revealed changes in Facial index, Mandibular width face height, Mandibular lower facial height, Chin Mandible face index. Post-surgical facial height alteration influences all the above-mentioned indices. According to Raymond Edler Orthognathic surgery showed dramatic changes in the soft tissue profile and also anthropometric measurements and indices showed good repeatability in terms of clinical assessment, photography, and digitization to compare these changes that are acquired through orthognathic surgical treatment modalities.

Divine proportions in Class III orthognathic patients revealed evident changes in the parameters such as forehead to eye and eye to menton. These changes are due to the facial height changes caused by the Maxillary and Mandibular surgery (combination or non- combinations) thus achieving a golden proportion in vertical parameters. Secondly, forehead to nose and nose to menton showed changes due to Maxillary advancement (Lefort I osteotomy) which brought about facial changes closer to the golden proportion. The third parameter which was altered was mouth to eye and mouth to menton, owing to the alteration of the facial height. Finally, the ratio of the upper lip to lower lip length was altered due to changes observed in lower face height due to mandibular set back causing an alteration in the soft tissue drape. According to Baker BW et al orthognathic and orthodontic treatment results in an improvement of overall esthetics of patients and also the proportions were equally likely to move away from or toward the divine proportion.

Though significant changes were noticed in both the groups, orthognathic patients revealed higher significance due to the changes in skeletal parameters thereby altering soft tissue drape resulting in values nearer to ideal anthropometric norms.

However, the study would have elicited more accurate results if 3D software was used. The future scope of the study would be assessing the anthropometric values and divine proportions by involving corrections in patients with craniofacial deformity and asymmetry.
Conclusion

1. Both orthodontic and orthognathic patients showed evident facial changes in vertical proportions post-treatment.

2. Orthodontic patients exhibited significant changes concerning mouth width ratios due to the retraction of the anterior teeth.

3. Orthognathic patients unveiled more significant vertical facial changes owing to the alteration of the skeletal bases deriving proportions nigh anthropometric & facial indices.

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References


22. August 2016


Tooth Eruption: A Review

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Abstract

Tooth eruption, is a developmental process which occurs in a 3–dimension, and various factors are considered to play a major role during tooth eruption. Numerous theories are put forward to explain this process in a different perspective. A better elucidation and understanding of this entire process is essential to identify the cause behind any deviations in eruption from the normal and in treating the same.

Keywords: Tooth eruption, root formation, pulp growth, bone remodelling, Vascular Pressure.

Introduction

The term, “Eruption” takes its origin from a latin word “Erumpere”. The definition of eruption is “the axial (or) occlusal movement of the tooth from its position of development in the jaws to its functional position in the occlusal plane”.[1] The phenomenon of tooth eruption is considered to be physiological, the timing of which depends on numerous factors. The initiation of tooth development and its eruption in the appropriate time becomes essential for the maintenance of a proper and healthy dentition.2 In the present paper, the initiation of tooth formation, various stages of the tooth development, root formation and sequence of eruption are discussed.

Initiation of tooth development: The initiation of tooth development is thought to be induced by the neural crest cells, which arise from the embryonic ectodermal layer.[1] In the tentative position of the jaws, a horse shoe shaped Primary epithelial band forms corresponding to the future dental arches. This gives out two subdivisions–Dental Lamina, from which the tooth bud forms and the Vestibular Lamina from which the vestibule develops.[5] Successional lamina arises lingually from the dental lamina, from which the permanent dentition arises, which are the successors of the deciduous teeth. The dental lamina disappears later but few remnants remain, called as the “Cell rests of Serres”.1 Vestibular lamina is the one which rapidly enlarges and degenerates thereby forming the future vestibule. With initiation, proliferative activity gets intensified at certain points of dental lamina which in turn results in the various stages of tooth development. The formative cells which arises as a result of proliferation is said to give the blueprint for future tooth by morpho differentiation.

Stages: Indicating the morphologic changes, the stages of the tooth development process includes, Bud, Cap, Early and Advanced Bell stages (Fig: 1). In the bud stage, each dental lamina differentiates at 10 different points to give rise to the ovoid or round swellings from the basement membrane, corresponding to the future dental positions. The swellings of the dental lamina resembles to bud microscopically. Since certain cells of the tooth bud form the enamel, it constitutes the enamel organ. Condensed ectomesenchyme subjacent to enamel organ constitutes dental papilla. Dental sac constitutes the condensed ectomesenchyme surrounding the tooth bud and dental papilla.

Cap stage of tooth development forms as a result of proliferation of tooth bud and an invagination in it. The peripheral cuboidal cells form the outer enamel epithelium and in contrast to this, the inner enamel epithelium is composed of tall columnar cells lining the
concaivity. In addition to these layers, there are central stellate cells which synthesize and secrete the hydrophilic glycosaminoglycans, and forms a layer called the Stellate Reticulum.\[1\] Enamel knot is a structure which is formed by the condensation of the central most cells of the enamel organ and studies reveal that, enamel knot acts as a signalling centre, playing essential role in determining tooth shape.\[1\]

In bell stage, the epithelial cap deepens and resembles the shape of a bell with outer enamel epithelium bordering enamel organ and inner enamel epithelium bordering dental papilla. It is divided into early and advanced bell stage. The point where outer and inner epithelium meets is called the cervical loop. In the cervical loop, cell division continues until crown formation is complete and epithelial component of root arises from here. Stratum intermedium forms between inner enamel epithelium and stellate reticulum.\[5\] During this stage, ameloblasts arise from inner enamel epithelium, odontoblasts differentiate from dental papilla, forming predentin and dentin layer (dentinogenesis), followed by enamel formation (amelogenesis). This process of deposition of dental hard tissues is referred to as apposition.

**Root formation:** Once the enamel and dentin reach the future CEJ, the root formation begins. The Hertwigs Epithelial Root Sheath (HERS) (Fig: 2), which plays an essential role in radicular dentin formation and in molding the root shape, forms by the proliferation of cervical loop and encloses the basal portion of the dental pulp. With the odontoblastic differentiation, the root dentin forms following crown dentin. With the odontoblastic differentiation, the HERS loses it structural continuity and detaches from the root. The remnants of HERS remain as discrete clusters which are referred to as the epithelial cell rests of Malassez.\[1\]

The root formation is followed by the formation of periodontal ligament and alveolar bone. Periodontal ligament, a highly vascular specialized connective tissue covers the tooth root and is present between cementum and alveolar bone. During the process of formation of Periodontal ligament, the cervical loop of the tooth bud is formed by the proliferation of inner and outer enamel epithelium in a continuous manner. The mesenchymal cells of dental follicle proper and perifollicular mesenchyme are the two different populations of the dental follicle cells. These cells are randomly oriented between the alveolar bone and hertwigs epithelial root sheath. Comparing these two populations of cells, the perifollicular mesenchymal cells which have an euchromatic nucleus, very little cytoplasm, rough endoplasmic reticulum with short cisternae, mitochondria, free ribosomes and an inactive golgi area are more widely separated. With the continuation in the root formation process, the cells in the perifollicular area becomes elongated due to gain in polarity. As a result of this, active synthesis and deposition of collagen fibrils and glycoproteins happens. The synthesized collagen fibres get embedded in the cementum. The alveolar bone, a part of maxilla and mandible, forms gradually with development and eruption of teeth. This forms and supports the tooth socket and diminishes in height with tooth loss.\[1\]

**Tooth movement:** The complex physiological tooth movement starts with the development of tooth and continues even after eruption, hence categorized into pre-eruptive, eruptive and post-eruptive movements. Pre-eruptive tooth movement begins from the time of initiation of tooth formation to the time of initiation of root formation.\[5\] The tooth movement occurs in association with the growth of the jaws. The pre-eruptive movement places the teeth in a definitive position in the jaw thereby enabling eruptive movement.\[5\] Pre-eruptive tooth movements occur intraosseously and requires remodelling of the bony crypt wall which happens by the selective deposition and removal of the bone.\[6\]

The eruptive phase of tooth movement starts from the root formation till the tooth reaches the occlusal plane. The tooth moves from its developmental position to the occlusal level. The principal direction of movement is either axial or occlusal. After the emergence, the tooth crown keeps moving occlusally until it comes in contact with its antagonist in the occlusal plane. During this process, the tooth crown begins to get exposed gradually with an apical shift of the dentogingival junction. For the intraosseous eruptive tooth movements, two things have to happen – the resorption of overlying tissue to provide an eruptive path and a force for the tooth to move vertically. The blood vessels decrease in number and is also accompanied by the degeneration of nerve fibers and the connective tissue overlying the tooth germ. This leads to the formation of an eruption pathway, which appears as an inverted triangular area of altered tissue.\[6\]

The post eruptive tooth movements happen, once the tooth reaches its functional position in the oral cavity. These tooth movements maintain the position of
the erupted tooth while the jaw continues to grow and compensates for the occlusal and proximal wear. These movements compensate the proximal and occlusal wear and continue throughout the life time.\(^6\) Tooth wear occurs even at the contact points between the teeth. In order to compensate it a proximal drift takes place. Histologically this drift is a selective deposition and resorption of bone on the socket walls by osteoblasts and osteoclasts respectively. Post eruptive tooth movements are divided into 3 categories namely, movements which helps in accommodating the jaw growth, movements which compensate the occlusal wear, to compensate for continued occlusal wear, movements which aids in accommodating the wear of tooth that occurs interproximally.\(^5\)

**Eruption:** Based on the type of tooth and the time of eruption, human dentition is categorized into Primary (Deciduous) dentition (Fig: 4A), Mixed dentition (Fig: 4B) and Secondary (Permanent) dentition (Fig: 4C). Primary dentition comprises of 20 teeth and erupts between 6 months and 2.5 years. They start exfoliating between 6 years to 11 years. Permanent dentition erupts between 6 – 7 years and 18 – 21 years of age. Since both the primary and permanent dentition is present in the age group between 6 – 12 years, this phase is termed as mixed dentition phase.

**Theories:** The mechanism which brings about the movement of tooth is still debatable, as it is thought to be a combination of various factors. Various theories have been proposed in order to brief out the process of eruption.\(^{12}\) The various theories of tooth eruption include:

**Root Formation Theory:** Formation of root causes an increase in root length and hence this is considered to be the essential cause for tooth eruption, as root growth produces a force sufficient for bone resorption. This concludes that, although a force is produced by root growth, this force cannot be translated into eruptive tooth movement unless there exist some structure that withstands the force at the base of the tooth.\(^5\) However the facts that went on as a drawback was that even rootless teeth was able to erupt. Some teeth erupt to a greater distance than the total root length; and the certain teeth erupt after root formation is completed or when the tissue essential for root formation is removed.\(^{14}\)

**Pulp Growth Theory:** As the root formation continues, the thickness of the radicular dentin increases resulting in the decrease in size of pulp cavity. The pulp growth theory states that the growth or constriction of the pulp generates a force which is propulsive in nature by the growth of dentin, pulp and the hydraulic effects happening within the pulpal vasculature. The drawback of this theory is that the eruption happens even in pulpectomized tooth.\(^6\)

**Vascular Pressure Theory:** Also known as “Blood thrust theory” or “Hydrostatic pressure theory”, it is considered to overlap with the pulp growth theory. It is believed that the tooth movement synchronises with the arterial pressure, thereby the local volume changes produce a limited tooth movement. It also states that the eruptive force is provided by the pressure exerted by the blood vessels within the tooth. This is against the fact that pulpless tooth erupt. Also studies state that the removal of root and local vasculature does not impede the eruption of tooth, which again becomes debatable.\(^{14}\)

**Bone Remodelling Theory:** This theory tends to play a prime role in tooth movement. Bony remodelling of the jaws has been linked to the tooth eruption, in that, in the pre-eruptive phase of tooth movement, the growth pattern of maxilla or mandible moves the teeth by the process of selective deposition and resorption of bone. Whether the bony remodelling around the teeth causes the teeth to erupt or is the effect of the tooth movement is not clearly known, but both the circumstances apply.\(^5\) Studies also indicate that the control resides within the bone lining cells, the osteoblasts. However it is also stated that a conclusion cannot be drawn out unless there also happens coincidental bone deposition in the base of the crypt, the prevention of which can pose a challenge to the eruption of tooth.\(^{14}\)

**Periodontal Ligament Traction Theory:** The formation and renewal of periodontal ligament is considered to be an essential factor in tooth eruption due to the traction power of the fibroblasts. A strong deal of evidence says that the eruptive forces exist in the dental follicle – periodontal ligament complex.\(^{14}\) Shrinkage of collagen fibers exhibits a force that plays a very important role in tooth eruption. If the tooth has to erupt, there should be a space in the eruption path, a lift or pressure from the apical region and required adaptability in the periodontal ligament.\(^{16}\) Bone resorption and deposition involved which plays a major role in the movement of the tooth, is considered to be one of the critical surface phenomenon between the soft tissue and the bony interface, which are present surrounding the developing
tooth. Later it is confirmed that the periodontal ligament fibroblast orientation significantly increased during eruption. However, studies state that, the force required for the normal physiological movement of the tooth is not exerted by the fibroblasts. Still, the lack of occlusal movement or mesial drift of ankylosed tooth and implants, which lack the intervening periodontal ligamentis yet to be explained.[14]

**Neuromuscular Theory:** Also known as the unification theory of tooth eruption it is primarily based on the neuromuscular forces which takes its origin from the contraction if the musculature present in the orofacial region. This theory states that the combined forces exhibited by the orofacial muscles, which primarily are controlled by central nervous system, play an essential role in the active movements of a tooth. This combination of forces are converted into energies of various forms such as electrical, electrochemical and biomechanical energies, which becomes essential for the stimulation of cellular and molecular activities taking place within and around the dental follicle and enamel organ. These changes happens inorder to prepare a pathway as well as to bring out other cellular functions required for a developing tooth to erupt.[15]

**Dental Follicle Theory:** This theory postulates that the dental follicle has the potency to induce, resorption of bone above the developing crown and bone apposition below it. This in turn brings about an eruptive pathway. [6]Experimental removal of dental follicle results in eruption failure. Various molecular studies reveal that the eruption is regulated by inductive signals between the dental follicle, reduced enamel epithelium, stellate reticulum and alveolar bone. It is also stated that the osteoclastogenesis or the bone resorption is regulated by the coronal aspect of the dental follicle whereas the process of bone formation or osteogenesis is regulated by the basal aspect of the dental follicle.[14]

**Molecular Events in Tooth Eruption:** The eruption of tooth is considered as a programmed and localized event. Various factors essential for tooth eruption are EGF, TGF, CSF, c-fos, NFκB, MCP, VEGF, RANKL, OPG etc. Determination of the molecules essential for tooth eruption, started with the isolation of Epidermal Growth Factor(EGF). EGF injection into the rodents accelerated the eruption of incisors. In rats both EGF and Epidermal Growth Factor Receptor (EGFR), immunolocalize to the dental follicle(DF), and get expressed in the early postnatal period.[8]

Transforming Growth Factor - α(TGF-α), has shown to accelerate the incisor eruption in mice. Rodents lacking TGF-α also erupt on schedule, showing that EGF alone can initiate the process. Osteopetrotic rodents usually have unerupted teeth and lack functional Colony Stimulating Factor-1(CSF-1). In such cases, injection of CSF-1 restores the process. This is because CSF-1 brings about and increase in the TRAP-positive mononuclear cells count, present in the dental follicle along with increase in the number of osteoclasts in the alveolar bone. Other genes which potentially enhance eruption are transcription factor genes c-fos and Nuclear factor kappa B(NFκB). c-fos is required for the process of fusion of mononuclear cells and osteoclasts and the role of NFκB is osteoclastic differentiation.[9]

Studies using RT-PCR showed that CSF-1 and MCP-1(Monocyte Chemotactic Protein-1) are expressed maximally in the dental follicles at day 3, and are usually chemotactic for the mononuclear cells.[10]CSF-1 is necessary for the osteoclast formation from monocytes. MCP-1 is considered to be the well-known chemokine for monocytes.[9] For eruption to occur, the mononuclear cells must fuse to form osteoclasts, for creating an eruption pathway byosteoclastogenesis. The essential molecules which promotes this are CSF-1 and Receptor Activator of Nuclear Factor-kappa B Ligand (RANKL), whereas osteoprotegrin (OPG), inhibits this. Vascular Endothelial Growth Factor (VEGF) has the ability to replace CSF-1 and upregulate the RANK expression on the osteoclast precursors.[10]

RANKL, a membrane bound protein, and a member belonging to the TNF (Tumor Necrosis Factor) ligand family, induce the formation and activation of from its precursor. OPG, found to prevent the differentiation of osteoclasts, also acts as a receptor for RANKL.[10] The expression of RANKL is upregulated by the by TNF-α, IL-1α and TGF-β. The OPG expression is enhanced by BMP-2(Bone Morphogenetic Protein-2), which enhances OPG secretion from dental follicle cells.[11] Currently, intense research has begun for transcription factors, the “master regulators” of osteoblastic differentiation. One such factor is Osf2(Osteoblast Specific Transcription Factor 2).[9]

**Factors affecting tooth eruption:** Various factors influence the tooth eruption and become a part of the disturbances occurring in it. The important local factors influencing tooth eruption are: Supernumerary teeth(Fig:3A), crowding(Fig:3B), arch length deficiency,
odontogenic cysts and tumors, dentigerous cysts, enamel pearls(Fig:3F), gingival hyperplasia (Fig:3D), premature loss of primary tooth, ankylosis (Fig:3E), thumb sucking, tongue thrusting (Fig:3C), eruption cysts, eruption sequestra and fibrous developmental malformations.[20]

Genetic factors play a prime role. Certain genetic disorders affect tooth eruption either by delaying or by a complete failure of tooth eruption.[3] Gender also plays an essential role with the permanent teeth erupting earlier in girls which is mainly due to the earlier onset of maturation.[3] Though very few studies have emphasized on the nutritional influence, it is proved that chronic malnutrition can lead to delayed eruption. Lack of nutritional supply alters bone mineralization leading to disturbances in bone formation. Eruption of permanent teeth is important as it also stimulates the jaw growth. Experimental evidences also suggest that preterm children have delayed eruption.[16]

Various studies have found that children who belong to the higher socioeconomic status show earlier eruption. [17] Studies also state a positive correlation between the height and weight of the body with teeth emergence, with the taller and heavier children showing an early dental growth.[18] Endocrinal disturbances, which affects the entire body also affects the dentition. The hormonal conditions such as hypothyroidism, hypopituitarism, parathyroidism and pseudohypoparathyroidism usually exhibit delayed permanent teeth eruption. In contrast, turner’s syndrome exhibits an accelerated development.[19]

The other systemic conditions influencing tooth eruption includes: Down’s Syndrome, Cleidocranial dysostosis, hypothyroidism, hypopituitarism achondroplastic dwarfism, Vitamin D resistant rickets, long term chemotherapy, ichthyosis, oral cleft, renal failure, exposure to hypobaria, radiation damage, celiac disease, anemia, dysostosclerosis, cerebral palsy, HIV infection, heavy metal intoxication etc.[3,20]

**Conclusion**

Tooth eruption is not an overnight event. The development of the dentition is characterized by phases of temporary discrepancies between the tooth size and jaw growth. The developing tooth does not move in a single direction, but in three dimensions and a gradual increase in the size of the tooth occurs within the alveolar bone before active eruption. It has been revealed that, the mechanism of tooth eruption is a complete, essentially time specific, biological interaction that occurs due to the coordination of multiple tissue elements in order to create the eruptive movement of tooth. Hence, awareness of the fundamental aspects, and thorough knowledge about tooth eruption and various events associated with it are necessary to understand the discrepancies in tooth eruption.

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**References**


Nanotechnology in Periodontics: An Overview

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Abstract

Nanotechnology is a booming field during recent years in medicine and dentistry. Application of nanotechnology in Periodontics is referred to as nanoperiodontics. Nanoscale materials show superior quality and outcome than traditional materials used in almost all areas including diagnosis, prevention, treatment, drug delivery and in dental implant coatings. This article will overview the history, classification, synthesis, applications, toxicity and future of nanoperiodontics.

Keywords: Nanotechnology, Nanoperiodontics, Category and Synthesis of Nanomaterials, Applications of Nano particles.

Introduction

Nanotechnology is a flourishing field in Periodontics. Their contribution in Periodontics is increasing gradually due to expanding research. Nanomaterials exhibit size less than 100nm in atleast one dimension. Nanoperiodontics involves the analysis of matter at subatomic and microscopic level, which has progressed in the field of Periodontics. Nanoperiodontics will perpetuate periodontal health by relating nanomaterials and biotechnology, including tissue engineering and dental nanorobotics. Though it is at a preliminary stage, it has ample impact in clinical and commercially available substances. Moreover, it is shown to have assured role in periodontal health care in near future.

History: The use of nanoparticles began as early as 9th century for creating glittering pots in Mesopotamia. It was Richard. P. Feyman a noble laureate who gave the concept of nanotechnology. In 1974, Norio Taniguchi devised the term ‘nanotechnology’, then Professor Kerie. E. Drexler used the term nanotechnology separately and also gave the first guidelines in the field of nanotechnology. Nanotechnology came into application after the discovery of scanning tunnelling microscope by noble prize winners Binnig and Rohrer in 1986. In the wake of book by Drexler, Peterson and Pergamil in 1991 highlighting the facts on nanorobots and assemblers, the term Nanomedicine was introduced by R.A. Freitus in 2000. To enhance the research in this field “National Nanotechnology Initiative” was developed in 2000 by Michael Roco. During 2005 and 2010, various innovations in the field of 3D robotics, networking and active nanoproducts production were done and from 2011, the generation of subatomic nanotechnology has been in use.

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Category of Nanomaterials:

![Figure 1: Category of nanoparticles](image1)

**Properties of Nanomaterials:** Properties of nanomaterials were first put forward by Michael Farady in 1857 during preparation of gold nanoparticles. Nanoparticles because of their surface area, dimensions and quantum effects exhibit enhanced rigidity, pelucidity, increased abrasion, stability, fire resistance and gas penetrability. Besides they also exhibit some unique features including ocular, electromagnetic characteristic different from one’s own discrete molecule or bulk molecule. Another remarkable property of nanomaterials is their self-assembling capacity, i.e. they form copious arrangements in the absence of third party.

**Synthesis of Nanomaterials:** Top down approach involves devasting procedures in which the large materials are converted into smaller ones and these are further manipulated to form nanoparticles. Bottom up approach involves uniting atomic level substrate through ionization of energy from various sources based on which they are classified as shown in Figure 2. In green synthesis, the herbaceutical products are used to synthesize nanoparticles, these nanoparticles are eco-friendly moreover the green synthesised nanoparticles are shown to exhibit enhanced properties. Biomimetic approach is the one in which microorganisms including fungus, bacteria or virus are used to manufacture nanoparticles; this method is in its initial stage and further research is needed to show its effectiveness.[1]

![Figure 2: Manufacturing techniques](image2)
Applications of Nanoparticles in Periodontics: 
Nanoscale particle application in medicine and dentistry during the last decade has grown enormously. The applications of nanoscale particles in Periodontics can be broadly discussed under the topics namely prevention, detection and treatment.

Prevention: Antibacterial Agents: Nanoparticle derived antimicrobial agents are seen to have superior effect due to their large surface area. Various agents that can exhibit antimicrobial effects includes silica, silver, copper and zirconia. Commercially available nanotechnology-based disinfectant, Eco-True containing silver salts are employed for disinfecting instruments and surgical areas.

Personal Protective Equipment (PPE): PPE and masks incorporated with nanoparticles having antibacterial effect are shown to exhibit enhanced protection.

Surface Coatings: Nanomaterial coatings used in paints, medical instruments and other highly contagious surface can be employed to control the spread of COVID-19.

Oral Hygiene Maintenance: The mouthwash and dentifrices containing nanoparticles are shown to aid in oral hygiene maintenance. The mouthwash incorporated with nanorobots and selenium nanoparticles controls halitosis through the destruction of volatile sulphur compound producing bacteria. Dentifrices incorporated with nanorobots are employed to destroy the pathogenic flora while preserving around 500 oral commensals; but these are under study.

Detection: Nanotechnology based diagnostic kits exhibit increased efficacy compared to their original counterpart, besides they are easily portable and highly sensitive and specific.

Nanotubes: These are employed for detecting and locating altered disease-causing genes. Under this category comes the quantum dots that radiate bright light on stimuli and are used for cancer diagnosis.

Nanobelts: Are similar to nanotubes in their application except that they are cost effective and technique insensitive compared to nanotubes.

Lab on chip Method: These device merge numerous devices on single chip and they are employed in Periodontics for detection of IL-1β, CRP, MMP-8 and TNF-α from whole saliva with minimum amount of sample.

Nanoplasmic Sensors: With the emergence of COVID-19 pandemic the need for rapid detection kits are increasing. This sensor rapidly detects live viruses using their corresponding antibodies.

Treatment:

Local Anaesthesia [LA]: Onboardnano computer-controlled micron sized dental nanorobots with colloidal suspension of functional analgesic molecules are employed. They are placed on gingiva and reach the dental pulp through gingival sulcus and dentin and they stay behind until the procedure is complete. Again, on command they reach the gingiva through the same way after restoring all sensations. They are painless and are said to have rapid onset of action in comparison to traditional LA.

Dentinal Hypersensitivity: Dental nanorobots occlude specific dentinal tubules instantly. Besides they also render durable results. Nanohydroxyapatite containing toothpastes are also shown to give promising results.[2]

Dental Longevity and maquillage: They can be enhanced with the use of nano sapphire or diamond particle layers on upper enamel layer.

Host Immunomodulation Therapy: Cafferata et al stated the multitasking efficiency of nanocarriers for treating periodontal disease.[3] In this study, he highlighted the immunomodulatory effects of host modulating agents delivered through nanotechnology-based system. They were shown to decrease the level of proinflammatory and bone resorbing T-cell namely Th-1, Th-22 and Th-17. They also increase the differentiation of TH-2 and Treg cells.

Bone Grafts: Nanoscale based grafts are seen to have superior outcome, because of their small dimensions that mimic the natural bone particles. They can be successfully used for the treatment of intrabony defects[4], socket preservation[5] and sinus augmentation procedures[6].

Nanomembranes: KS Hong et al have used silk fibroin nanomembrane (Nanoguide) in guided bone regeneration and declared them to exhibit superior bone formation in comparison to biomesh.[7]
**Nanoneedles:** Needles containing nanosized silver particles have been developed. They are usually painless and technique insensitive.

**Nanotweezers:** These are under development and will make cell surgery possible in mere future.

**Tissue Engineering:** Nonbiologic self-assembling system production by nanotechnology has made tissue engineering through nanoparticles possible. Polymer based scaffold for cell seeding, growth factor delivery and tissue engineering via the nanoparticles embedded in site of tissue damage can also be constructed. Though tissue engineering through the use of nanoscale perspectives is spellbinding, their use in clinical scenarios still remains fictious.

**Subgingival Irrigation:** Hayakumo et al has described the use of ozone nanobubble water produced by nanobubble technology in subgingival irrigation. The results of their study demonstrated that it can be used as an adjunct to periodontal therapy because of their enhanced antibacterial activity.

**Laser and nanoparticles:** Laser irradiation on nanotitaniumparticles coated surface are shown to increase collagen production. Using this principle, gingival depigmentation and other periodontal procedures can be carried out. Sadony and Abozaidillucidated that nanoparticles along with diode laser has the potential to decontaminate dentin surface.

**Chronic periodontitis:** Kadam et al hypothesized that adjunctive use of silver nanoparticle gel with scaling and root planinghas superior effect in comparison to tetracycline gel in management of chronic periodontitis. Nanoporesolving lipid mediators because of their increased ability to penetrate into periodontitis affected tissue may be an effective method to manage chronic periodontitis.

**Biofilm management:** Biofilms incorporate wide array of microorganisms that results in increased antimicrobial resistance and pathogenicity. Till today, effective technique for biofilm management has not been devised. Nanoscale materials including zinc oxide, titanium dioxide, copper oxide, carbon nanotubes, chitosan, gold and quaternary ammonium compounds are shown to exhibit antibiofilm activity through the disruption of bacterial cell membrane by generating reactive oxygen species.

**Nanoantibiotics:** These are the antibiotics that are delivered through nanocarriers with specialized antibiotic coating on their surface. They manifest broad spectrum of activity and decrease the probability of secondary infections. Gold nanoparticles are described to have increased adhesiveness to antibiotics. Besides nanoscale particles and antibiotics demonstrate positive interactions.

**Wound Healing:** Improved wound healing with the use of nanomaterials has been reported in many studies. Polymer and lipid-based materials revealed excellent antimicrobial and antiinflammatory property with enhanced wound healing capacity. Carbon based particles showed good wound healing and angiogenesis, besides the metal-based nanoparticles showed scarless healing.

**Local Drug Delivery:** Drug delivery using nanotechnology has been formulated as they have increased biocompatibility, targeted release, decreased antimicrobial resistance, long duration of action and less toxicity. Various drug delivery agents include liposomes, micelles, dentrimers, polymers, nanorattels, nanowires and niosomes. Nanoencapsulation technique is a recent technique developed by SWRI for delivering antibiotics and vaccines. Besides nanocomposite hydrogel-based delivery system through the use of triclosan, chitosan and biodegradable nanoparticles are also productive delivery vehicle.

**Nanoscale particles in dental implantology:** Chemical and mechanical modifications dental implants are said to have better osseointegration. Various nanoscale mechanical modifications include creation of nanoareas like nanogrooves, nanopillars and etc. Chemical coatings include coating with nanoparticles of diamond, hydroxyapatite, graphene, titanium oxide and metalloceramic based nanomatters. Nanohydroxyapatite coated implants are commercially available as None Tite BIOMET 3i and have around 50% of nanohydroxyapatite.

**Self assembling implants:** C.X. Li et al investigated the effectiveness of nano structured self-assembling dental implants in type-II diabetes patients and stated that they exhibited decreased marginal bone loss and better osseointegration than the conventional dental implants used.
Periimplantitis: Clot stability can be increased by using nanohydroxyapatite on citric acid conditioned surface. Elangovan et al in their study demonstrated enhanced fibroblast proliferation with the use of platelet derived growth factor-BB delivered using calcium phosphate nanoparticle.[28]

Toxicity of Nanoscale Particles: Increased surface area although seems to be beneficial they can cause increased toxicity by enhancing the duration of action, aquaphobic drug solubility and also their ability to cross blood brain barrier. Because of their small size, the host immune system reaction to the nanoparticle cannot be detected. Other drawbacks include difficulty in concomitant bulk synthesis, haemolytic activity towards host cell, cost ineffective, social and ethical challenges. Biocompatibility of traditional nanoparticles is unsure, since the nanoparticles in gas exhausts from vehicles and industries are shown to elevate respiratory and cardiovascular morbidity & mortality and to overcome these green nanoparticles were introduced; but still, they are synthesized in crude form and is also difficult to find which among the component is active constituent.

Future of Nanoperioodontics: Method for synthesizing high calibrated nanoparticles in bulk will be developed in near future. Most of the nanoparticles-based studies in Periodontics are in-vitro, the productive outcome of in-vivo studies is to be demonstrated. Materials with enhanced antibacterial effect, self-repairing property and compatible drug carriers are to be developed. The self-assembling antimicrobial peptides are under study and may be used for the treatment of periodontal diseases. Numerous untreatable diseases may be treated using nanotechnology. Nanotechnology based diagnosis and treatment of COVID-19 pandemic is the present focus of research and will be made possible in near future.

Conclusion
This is the era of nanotechnology since there is a gradual increase in research and applications of nanotechnology in numerous fields. This review has described in detail the history, classification, manufacture and application in Periodontics of nanoscale particles. Although the field of nanoperiodontics is fascinating, data on long term in-vivo effect of nanoscale particles are essential for clinical application.

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References


Congenital Granular Cell Epulis: A Rare Entity

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Abstract

Congenital granular cell epulis (CGCE) is a rare soft tissue lesion seen exclusively in the neonates which is benign in nature. The common site of occurrence is the maxillary or mandibular alveolar ridge. The clinical significance of this tumor is its location which hampers with breast feeding, posing a potential airway complication and parental apprehension. In this literature we report a case of a one day old baby who reported with feeding difficulty, diagnosis of the lesion and the surgical management of the same.

Keywords: New born, Pregnancy tumor, Congenital Epulis.

Introduction

Congenital granular cell epulis (CGCE) is a rare soft tissue lesion seen in the neonates which is benign in nature. The common site of occurrence is the maxillary or mandibular alveolar ridge[1,2]. It was first described by Neumann in the year 1871 and it is also called as Neumann’s tumor. The etiology is unknown. Clinically the lesion presents as a solitary mass or as multiple lesions. Large or multiple lesions can cause airway obstruction as well as difficulty in post-natal feeding[3]. The lesion appears either as a sessile or pedunculated mass of varying sizes, smooth surfaced, pink to reddish in color and firm in consistency. Congenital epulis does not increase in size after birth. Spontaneous regression has been reported in few cases[4].

The lesion is benign in nature with no recurrence. The treatment modalities is surgical excision of the mass by conventional method or by using CO2 laser[5]. Histiogenesis is not certain, several theories of Origination of the lesion has been postulated namely odontogenic, fibroblastic, hystiocytic, myoblastic and neurogenic. This case report describes the management of a 1 day old neonate with congenital granular cell epulis in the anterior maxillary alveolar ridge.

Case Report: A one day old female neonate reported to us with a complaint of swelling in the upper right front tooth region which was noticed at birth. The swelling was protruding out of the oral cavity (Fig: 1). The major concern for the mother was that the swelling hampered breast feeding. The infant was otherwise healthy weighed about 3.3 kgs. The pregnancy was normal and delivery was normal at full term. Family history was non-contributory.

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On clinical examination, a pedunculated mass arising from the right maxillary alveolar ridge of size 1.5x1 cm. The color appeared the same as the oral mucosa. On palpation, the swelling was firm in consistency and smooth attached by a thin pedicle to the alveolar ridge. It interfered with the normal closure of the mouth with no airway compromise. The clinical diagnosis was made as congenital epulis. The general physical examination of the child was normal. Surgical excision was planned and performed using electrocautery to provide hemostasis under general anesthesia. (fig:2) Recovery was uneventful with no intra-operative and post-operative complications. The child was assessed after a week and seemed to be thriving and gaining weight. The specimen (fig:3) was fixed in 10% formalin and processed for histopathological examination.

Microscopic examination revealed circumscribed lesion lined by stratified squamous keratinized epithelium with cluster of cells with a central nuclei and eosinophilic cytoplasm. Histopathologically it was confirmed as congenital granular cell epulis.

**Discussion**

CGCE is a rare benign lesion seen in the neonates. CGCE has a female predilection with an 8:1 female to male infants ratio and more commonly is seen in the maxillary alveolar ridge, as seen in our case [6]. Majority of the case presents as a solitary pedunculated mass or as multiple tumours [7,8]. Large lesions causes interference with feeding and airway obstruction. Usually the diagnosis is made at birth. Prenatal diagnosis can be made with an ultrasonography and MRI by the 36th week of gestation which would further be helpful in planning the treatment in prior [9].

The clinical presentation of the tumor is always smooth surfaced, sessile or pedunculated, the color of the lesion is same as that of the oral mucosa. It is firm in consistency and non-tender. Differential diagnosis can be given as fibroma, hemangioma, granuloma, schwannoma, myoblastoma [10]. Prenatal MRI of oral cavity would give a better picture to differentiate from other lesions [11,12].

The surgical intervention includes immediate surgical excision by conventional method or by the use CO₂ laser [5]. Immediate intervention is required as the lesion may interfere with feeding as seen in our case and large lesions would cause airway obstruction. Literature shows surgical excision of the lesion does not hamper the bone growth or teeth eruption [11,12].

In our case the surgical excision of the mass was done under general anaesthesia with nil intra-operative difficulties. The neonate was comfortable with feeding from the next day. Patient was followed up and the healing was satisfactory.

Histopathological features includes circumscribed mass comprised of nests of polygonal or spindle cells with abundant eosinophilic cytoplasm with eccentric nuclei. Lined by stratified squamous epithelium with absence of rete ridges [13,14].

In our case the lesion was present in the anterior maxillary region of size 1.5 * 1 cm which was pedunculated, smooth surfaced clinically correlating with the features of Congenital granular cell epulis. The main concern in our case was that the lesion interfered with feeding. So immediate surgical intervention was done. Prenatal diagnosis was not made with Ultrasonography or MRI. The diagnosis was confirmed histopathologically.

**Conclusion**

Congenital granular cell epulis is a rare entity. The tumor is mostly misdiagnosed as it is a rare occurrence.
Our case report is to emphasize the importance in diagnosing the lesion and treating it accordingly. The clinician should also consider congenital/benign/malignant/lymphatic malformations as differential diagnosis. A multidisciplinary approach with the team of the pediatric surgeon, oral maxillofacial surgeon, anesthetist and oral pathologist is required to arrive at the correct diagnosis and perform an immediate surgical intervention. Prognosis appears to be good.

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**References**


Ethics in Adult Orthodontics

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Abstract

Ethics is the understanding and the ability to differentiate right from wrong in human behavior. Dental ethics denotes moral duties and obligations of a dental practitioner towards their patients, fellow colleagues, and the society at large. An ethical practice among dentists ensure good patient care in concurrence with their treatment needs. Ethical principles and codes introduced by regulatory bodies benefit the patient, avoid harm, and respect patient’s preferences. Ethical dilemmas are faced by orthodontists during orthodontic interventions, even though important human values may be at stake during the course of treatment. The code of ethics in dentistry warrants an orthodontist to act in the best interest of their patients regardless of their financial status, even putting themselves at jeopardy if need be. This article thus focuses on the morals and ethics that should be abided by an orthodontist in order to deliver the best possible care to their patients.

Keywords: Ethics, Orthodontics, Dental practice, Ethical practice, Dentistry.

Introduction

The etymology of the term “Ethics” is from the Greek word “Ethikos” which means character or conduct. It is defined as the systematic examination of human behavior. Any decision or action taken to resolve a dilemma should be completely thought through before its initiation.[1]

Both medical and dental specialties consist of various ethical principles and values which are strictly followed and respected for many years now. Like any other dental procedure, orthodontic interventions deal with ethical dilemmas and hence should be subjected to specific ethical inquiries. Although, it is not every day that an orthodontist faces life or death situation in their practice, however, they deal with important human values which are at stake during the course of orthodontic treatment. Some of these include, pain prevention and management, preservation and restoration of oral function for normal speech and mastication, preservation and restoration of patient’s physical appearance, and enhancing a sense of control and responsibility over their health.[2] Apart from treating adult patients, orthodontists also manage a large number of pediatric patients and may encounter ethical issues in that regards it is within the purview of the orthodontist to provide the best treatment option for the child, help in surrogate/guardian decision making, and enable access to care.

This review article thus highlights the ethical dilemmas faced by an orthodontist in their day to day clinical practice and provides an insight into the effective management measures in accordance with the regulations.
**Ethical Principles:** Ethical problems usually arise when there is an uncertainty or conflicting moral obligations.[3] The orthodontist should be aware of the ethical principles present for clinical decision making in their practice. The aim of these codes is to enhance a sense of ethical responsibility in order to ensure the highest level of professional and ethical consciousness to maintain a standard of decision making and conduct.[4] The major principles include:[5]

1. To do no harm (non-maleficence)
2. To do good (beneficence)
3. Respect for persons
4. Justice
5. Veracity or truthfulness
6. Confidentiality

**Ethics in Clinical Practice:**

**Inform Before Perform:** Once the patient has decided to undergo orthodontic treatment, details of the proposed treatment plan from the start to end until retention phase must be explained to them. The information should be conveyed in a lucid easily understandable language without much usage of complicated dental terms. This can be done using hand held models, patient casts or even showing improvement in profile and frontal views after orthodontic treatment using latest digital software. This essential step before the start of active treatment is useful in encouraging and motivating patients towards the treatment, thus gaining their trust towards the orthodontist.

**Right to choose:** Decisions regarding orthodontic treatment are not entirely decided by the orthodontist. They are required to respect the moral and legal authority of the patients and incase of pediatric patients, the parents.[6] Various treatment options, if any, should be informed and clearly explained to the patients prior to the treatment. The health care professionals should respect the patients right and give them the freedom to decide upon their treatment. Patients must be given full authority in the decision making process and must not be forced to make a decision that is favored by the orthodontist.

**Benefit/Risk ratio:** The treating orthodontist must first understand the treatment needs of the patient in depth to have a clear view of the type of intervention required for them. Any orthodontic treatment which is considered ideal and beneficial for the patient, may have certain risks and limitations associated with it. Alternative treatment plans options with lesser risks, if any, should be put forth for the patients to decide, which will benefit their oral function, appearance, and quality of life, rather than not doing any treatment. Orthodontists have a moral obligation to support patients’ interests and to do no harm.[7]

**Course of treatment duration:** Total time taken for completion of orthodontic treatment depends on the severity of malocclusion.[8] Patients should be informed about the treatment duration prior to start of treatment as the time taken for completion of extraction cases is more than non-extraction cases. Estimated treatment time predicted by an orthodontist can be delayed due to secondary factors like irregular or missed appointments and/or broken appliance or debonded brackets. In case of increase in treatment duration due to the secondary factors the orthodontist should differentiate between their responsibility and that of patients, thereby encourage them to be more regular and responsible towards their treatment.[9]

**Retention Phase:** Before removal of orthodontic appliance, the case should be finished in good occlusion without premature occlusal contacts to ensure long term stability. Post active treatment, retainers should be given with instructions on their timely wear to prevent relapse. Importance of retainers in maintaining the corrected malocclusion should be informed prior to the start of treatment and should be emphasized on the duration of wear post active treatment. Patient cooperation in wearing retainers is vital for maintaining the achieved results.[10]

**Informed consent form:** In today’s era of dental practice, patients are the consumers while the doctors are the service care providers. Naturally, legal doctrine of informed consent is plays a pivotal role in everyday practice which has instilled fear in most dental health care professionals. According to the guidelines laid down by the American Association of Orthodontists, an informed consentought to include details such as treatment results and duration, presence and level of discomfort, risk of relapse, extractions and orthognathic surgery, possibilities of decalcification and dental caries, root resorption; periodontal diseases; risk of temporomandibular disorders, status of impacted and ankylosed teeth, allergies and usage of temporary anchorage devices in treatment.[11] The orthodontist
should attach documents of acknowledgement, a consent form and an authorization letter for the usage of patient information and their treatment records in case of future publication.[11]

**Medicolegal Concerns:** It is the medicolegal responsibility of the orthodontist to take radiographs and photographs of the patient before the start of the treatment, after getting a clear consent from them. These records are useful for screening any pathologies or anomalies, planning treatment mechanics for achieving best results, comparison of treatment results achieved and to get a second opinion if needed. Patients records must be filled and maintained in good condition even after orthodontic treatment. Using patients records, especially extraoral photographs for publication and research should be done only after patients’ written approval.[11,12]

In case of referral of the patient to another orthodontist the copy of the patient’s record must be saved. A detailed history if the patient, treatment plan and the progress of the treatment so far has to be transferred to the referral orthodontist. This must be done to ensure that no difficulties are faced both by the orthodontist and the patient in finishing the treatment. A clear and detailed consent should also be enclosed form both the parties.

Similarly, if the patient wants to discontinue the treatment due to personal reasons, orthodontist should explain the ill effects of incomplete treatment in case of extraction, and chances of relapse. Patients written consent should be obtained before removal of the appliance.[7,13]

**Sterilization Protocols:** Strict sterilization protocol must be meticulously followed must be strictly followed in the dental office. Clean sterile instruments, orthodontic attachments and wires should be used for each and every patient. The Operating orthodontist should wear personal protection equipments and maintain a sterile working environment.[14]

**Discussion**

Ethics is a subject of necessity which is considered in all aspects of life either consciously or unconsciously.¹ Health care professionals possess training and expertise which the patients lack, making the treating orthodontist responsible for the decision making in regards to the treatment offered to the patient.[15]

It was suggested by Johnson in 1946 that a philosophical approach to ethics is in fact better than the dualistic approach which will allow the dental professional to pursue an ethical practice following a more eclectic approach.¹⁶ Ethical problems arise from conflicts between orthodontist’s obligation to deliver best care to the patient and the need to respect their decisions. These are based on the underlying ethical principles of beneficence, and respect for autonomy of patients.[8] Orthodontists should clearly outline the indicated treatment plan, the benefits and burden of the procedure as well as the consequence of no treatment. Information shared in an open fashion, should enable the patients and parents, in case of pediatric patients, to freely participate and make decisions.

Studies have shown that dental practitioners do not strictly follow an ethical clinical practice.[¹⁷–¹⁹] Hence, regulatory bodies such as state dental councils and orthodontic societies should form ethical committees to actively monitor and guide the orthodontists to perform a healthy practice abiding by the codes of ethics.[12]

**Conclusion**

In the present scenario of dental practice, Ethics is of immense significance that gives an important dimension to patient care. Professionalism dictates profession as a correction to commercialism and is built on prioritizing professional ethics over personal interests or business.

The codes of ethics require an orthodontist to act in the best interest of patients regardless of their financial status.[8] Abiding by these basic ethical codes will not only give simple moral justification in their duty as an orthodontist but also will protect them legally as a professional in providing the best healthcare to the community.

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Current Trends and Challenges in Laboratory Investigation of the Covid-19 Pandemic

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Abstract

The ongoing virus impact in the whole world is COVID19 infection has led to unprecedented crisis paving to outrage of the world citizens. The highly contagious virus started its spread from the China during the month of late November 2019 and spread to all over the world. The COVID-19 pandemic led catastrophe and earlier episodes of similar epidemic SARS outbreaks in China and Middle East interrogate the preparedness in handling such predicament. The major symptomatic manifestations of patients are not so accurate and vary from one person to another and higher frequency of asymptomatic cases often misled diagnosis, unless the CT chest scan findings affirms the disease progress into fatal SARS. Disambiguation over the other viral respiratory illnesses similar to COVID-19 needs to be meticulously handled by emphasize on simultaneous co-detection of multiple viral pathogens. Henceforth, robust diagnostic tools are necessitated to substantiate suspected cases and to screen large population in less time. This review would keenly focus on the challenging prime requisite for accurate laboratory testing of the infection and the potentials of various techniques in investigating the pandemic.

Keywords: Combined ELISA, COVID-19, SARS2, N/S-IgM/IgG rapid card, Viral load.

Introduction

Novel Corona virus 2019 (nCoV) was a rapid spread and was officially identified by the Chinese Doctors and approved by CDC later, WHO declared pandemic emergency over the disease and outbreak rapidly started in the month of January 2020. The 2019 nCoV was confirmed of the transmission from one person to another and the active infection were evidenced outside China ever since the outbreak, therefore warranting the cause for pandemic. As of October 2020 approximately 9,26,544 fatal cases were reported and over 29.2 crore people were infected with the viral pathogen. The government all over the world and as per the guidelines of WHO has stopped the travel to and fro overpandemic and lockdown periods getting extended in different countries leading to distress among the world citizens[1,2].

The nCoV affects the respiratory system that can range from mild to fatal illness. Symptomatic cases shows high body temperature, wheeze, improper and difficulty in breathing, sore throat and diarrhea often undistinguished from other pathogenic pneumonias. According to WHO asymptomatic cases without any
prompt signs and symptoms are the major threat to the healthcare workers by the way of spread [3]. The delayed and/or failure in probing of outbreak investigation would lead to extensive morbidity [4]. Here, our review focus on various means of testing and strategies for early, robust diagnosis in handling the global emergency.

Ancestrally, the CoV family infects many eukaryotes especially mammals and avian species, very few strains of the CoV family are circulating among humans causes acute respiratory infections. Genomic analysis of the virus revealed 89% and 82% of nucleotide similarity with bat represent the virus as SARS-like-CoVZXC21 and human SARS-CoV respectively and 40% amino acid identity matched with the peripheral sub domain of the spike’s present in the virus acts as receptor binding domain [6]. Historically, 2002-2003 major epidemic outbreaks in China due to SARS-CoV originating in bats were reported of significant mortality [3].

COVID-19 manifestations and clinical diagnosis:
ARD associated with the respiratory Syncytial virus, parainfluenza viruses, metapneumovirus, and CoVs, are hugely uncovered. Understanding the SARS-CoV-2 pathogenesis is imperative in drafting guidelines for screening COVID-19 at the earliest. The clinical variety of infection varies from without symptomatic forms to fatal sepsis and multiorgan dysfunction [9]. Fever (88%), dry cough (68%) are mainly the general signs of infection; other non-specific symptoms are also present in the infected person from mild fatigue, to other respiratory viral infections[4]. Radiographic chest examination during the early COVID-19 presents multiple plaques, changes in the lung margins and as infection develops severity it leads to ground-glass opacities, lung consolidation, and cardiac injury depicting the cardinal signs of ARD as reported by WHO. Another Scientist identified that the infection was related with inflammation in brain of humans with the pathogens RNA sense in cerebrospinal fluid (CSF). Following, Poyiadji et al stated a similar case study with immune mechanism where acute necrotizing encephalopathy is a type of post-infection[10].

The sHLH is a respiratory infections caused by hCoVs and its salient feature of sHLH include hypercytokinaemia, cytopenias, hyperferritinaemia, and blood clots leading to vascular inflammation, thromboembolism, hypotensive shock with multiorgan failure [11]. Garcia et al studied several other bodily
dysfunctions were positively combined, with the death rate and inverse proportionate with P/F ratio. The acute cardiac injury in COVID-19 cases is diagnosed with flanking serum levels of cardiac biomarkers or from abnormalities in recorded in ECG. The blood profile of the COVID-19 cases reveals eosinopenia, creatine kinase, procalcitonin, elevated lymphocytes, and elevated markers for inflammation are interleukin-6, erythrocyte sediment rate and others [4, 12]. The concurrent recognition of dual biomarker is protein A resistant against Myxovirus, CRP test identifies host immune response and also facilitates viral and bacterial acute respiratory illnesses differentiation [13]. These auxiliary findings help the physician in evaluating prognosis of COVID-19 cases upon treatment and in epidemiological surveillances.

**Laboratory testing of COVID-19:** According to the WHO recommendations the laboratory requisite should follow up based on the evidence of epidemiological history, clinical manifestations fulfilling criteria for case suspect definition. Unlikely the typical COVID-19 manifestations are misleading, therefore auxiliary screening of immune components and quantification of pathogen nucleic acid by RT-qPCR is empirical [2,9]. The immune response to CoVs follows a production of antibodies IgM and IgG specifically associated with viral respiratory tract infections. In the presence of viral load IgM antibodies vanish at 12th week, while IgG antibody lasts long playing a protective role and specific titer varies during the acute and convalescent phase. The antibodies against the virus are activated after few weeks of infection [14,15]. Simultaneous likely evaluation of prognostic seromarker included complete haemogram, renal function, liver enzymes profile, creatine kinase, lactate dehydrogenase, electrolytes, CRP, myocardial enzymes, cardiac troponin I, Coagulopathy profile like ferritin are valuable in periodical assessment of the severity and recovery from the disease [12].

**Clinical specimens:** WHO and CDC recommend clinical laboratories handling COVID-19 patient samples with the potential to generate aerosols need to practice standard precautions within a Class II Biosafety Cabinet (BSC) facility to prevent transmission in healthcare settings. Use of appropriate personnel protective equipment, precautions for droplet/aerosol generating specimen must be exactly adapted. Laboratories performing live SARS-CoV-2 propagation and/or isolation, handling large volumes of infectious samples should strictly execute in no less than a BSC-3 milieu [16]. Occurrence of high viral infection in upper and lower respiratory tracts have been reported and therefore sampling the respiratory specimens within 5-6 days of the infection pneumonic symptoms facilitates accurate diagnosis [17]. Zhou observed longer duration of viral infection people for up to 37 days, apart from these, infection is also detected from fecal deposits, urine sample and blood, but less effect compared with respiratory specimens [18]. Investigation utilizing open reading frame 1ab gene specific RT-qPCR in quantifying the virus in assessment of shedding pattern in 1070 specimens revealed 93% bronchoalveolar lavage fluid (BALF) were positive, followed by other parameters showed a negative result [19]. In clinical suspects single respiratory specimen does not eliminate the analysis, testing the respiratory tracks are recommended [9].

URT samples are simple method to collect and therefore frequency of testing patients with mild symptoms, and can be easily implemented in resource limited settings [9]. Reportedly, the swabs from oral pharynx region was more accurate than nasal pharynx specimens; however, the pathogens RNA present in Oral specimen was comparatively least than positive Nasal specimens (63%). CDC advise labs to collect the URT-NP swab and OP swab is a least priority, and if collected also the samples should be mixed with the NP swab and transported in viral transport medium [19]. For the most sensitive detection of virus BALF is suggested as the collection of mucus from lower airways but this increases the chance of biosafety risk to healthcare workers.

Viral RNAemia is chiefly warranted in COVID-19 and therefore along with blood sampling- fecal, urine, stool samples investigations are vital in understanding the pathogenesis and route of transmission [20]. Seminal fluid collected from 34 recovering adult Chinese male were tested negative and the expression profile of the enzyme angiotensin-2 and integral membrane enzyme serine protease 2 within the male reproductive gland testicles showed no significant results [17].

**SARS-CoV-2 cultivation:** The techniques involved in viral cultivation are by Cell culture and nucleic acid-based tests to respiratory viral infections. The viral shedding in the URT secretions are ideal for pathogen recovery, however the viral specimens varies with the viral pathogenesis [19]. The bacterial infection in lungs is identified with blood cultures in corona positive patients cases were 6.9% and specific species were also found in
45.8% of corona patients with *Mycoplasma pneumoniae*, *Haemophilus influenzae*, and *Pseudomonas aeruginosa* infections \[21,22\]. Pyrc et al showed that separation and categorization of HCoVs. For several respiratory viruses the epithelial border has been determined via HAE cultures \[23\]. Harcourt et al isolated SARS-CoV-2 from NP and OP specimens by cultivating in Vero cells and evaluated the cytopathic effect using standard plaque assay \[24\]. The presence of virus was also detected in saliva test patients (91.7%) by RT-qPCR and the load was determined to be $3.3 \times 10^6$ copies/ml when cultivated on Vero E6 \[25\].

**Immunodiagnostic method for COVID-19 testing:**

**Rapid screening test:** Rapid COVID-19 testing kits designed based on lateral flow immunoassay are of diagnostic importance in cost-effective screening during acute phase of infection thereby reducing the need for molecular confirmatory tests in large-scale epidemiological surveillance. COVID-19 rapid card tests are detects specific viral antigens E, S, N and/or specific antibodies in the respiratory and serum samples. The immunochromatographic assay was reported to detect antibodies in the patients were 43.6% suspected cases tested negative for viral RNA \[26\]. The comparative sensitivity of three techniques that included IgG/IgM ELISA, colloidal gold-immunochromatographic assay and RT-qPCR in testing COVID-19 revealed no significant differences \[27\]. The combined test method has 88.66% sensitivity and specificity of 90.63%. However, there results were still remain false being dependent on the serum level of antibodies and the phase of immune reaction \[28\].

In a similar comparative investigation on the combinatorial detection of viral strain IgM and IgG using immunochromatographic strip along with RT-qPCR. Pseudopositive results incurred may be due to sharing of similar epitope with the others members of the CoV family, and other viral etiology of common cold. However, these misinterpretations can be averted with the use of antibody probes which are monoclonal in nature, and the other CoVs are not traced to be circulating in the recent times \[29\]. Combination of viral RNA and specific antibody identification by rapid testing, even in early phase of onset. In exceptional cases, the RT-qPCR confirmed COVID-9 patients exhibiting weak, late or absence of antibody responses. The majority of patients develop rapid antibody testing can be validated chiefly in the recovery phase. Several commercial rapid card kits available in the global market are designed feasibly for screening the viral antigens present in the respiratory specimens. Antigen screening kits are useful in evaluating early exposure ahead of onset of clinical symptoms \[30\].

**Enzyme Linked Immunosorbent Assay (ELISA):**

The viral antigen or specific antibody is of prognostic value in quantitative assessment of immune system of the diseased host. The combined viral nucleocapsid protein specific IgM/IgG ELISA showed lesser false-positives with IgG detection compared to single antibody assays \[28\]. In investigating the nucleocapsid and spike based testing for antibodies in identified cases revealed 80.4% and 82.2% positive rates for anti-N and anti-S SARS-CoV-2 antibodies and the increase in cases as the days are prolonged \[30\]. The virus enter into the target cell with the help of glycoprotein present in spike, which dilutes the antibodies upon URT infection; IgA specific ELISA are useful in early screening. Perera et al developed spike protein from the viral strain as a receptor-binding domain IgG/IgM ELISA with sensitivity and specificity comparative to microneutralisation and 90% plaque reduction neutralization tests \[31\]. However, the utility of ELISA in testing of COVID-19 is restricted to sophisticated laboratories as the protocols are heavily laborious and are time consuming.

**Chemiluminescence immunoassay (CLIA):** Luminogen based chemiluminescence assay for the identification of anti-viral nucleocapsid antibody was formed by Lin et al utilizing the recombinant full length nucleocapsid antigens mixed to the tosyl magnetic beads incubated with the test serum and analyzed in an automated chemical immunoluminescence analyzer. In this method 14 persons were reported to be positive cases (21%) but they are negative and this was identified for antibody testing by ELISA and chemiluminescence assays. Cai et al developed magnetic CLIA specific to ORF1a/b, S, and N proteins for detecting the target antibodies against the virus. Compared to the ELISA kit, chemiluminescence assay showed more promising results \[32\].

**Conclusion**

The contagious spread of the virus demands high processing; the clinical laboratory investigation played the major defensive role to seclude victims away from calamitous COVID-19 pandemic. The accuracy of
laboratory reporting are influenced by a number of interrelated factors such as virus shedding, time period of specimen collection, viral load titers, host immune response and age predicts the diagnostic sensitivity of the laboratory testing. Adding to the low level of testing centers and inadequacy of trained professional is worrisome inflating the health care workers and the public spread is postponed due to isolation of the probable missed cases leading to community spread. These challenging variants in the screening and confirmation of SARS-COV-2 infections define the interdisciplinary secular path for coherent laboratory testing to the necessity of standard clinical practices. The coronavirus and other viral infections associated physiological changes (heart rate, SpO2) which are potential indicators can be monitored using wearable sensors (Apple, WHOOP watches) would be of prognostic value. The future directions leading the mankind in handling such pandemic would be the progress in scientific learning on the advanced diagnostic technologies.

**Ethical Clearance:** Nil

**Source of Funding:** Meenakshi Academy of Higher Education and Research, Chennai, India

**Conflict of Interest:** Nil

**References**


15. Iwen PC, Stiles KL, Pentella MA. Safety considerations in the laboratory testing of specimens suspected or known to contain the severe


A Comprehensive Study on the Efficacy of Copper Antifouling Coat on Biofilm-Forming Organisms in Industrial Cooling Towers

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Abstract

Cooling water systems serve as an ideal aquatic environment for microorganisms to proliferate and colonize. Biofouling and scaling are two major factors that adversely influence the water-cooling efficacy of industrial cooling towers, as they not only reduce the heat transfer capacity but also enhance corrosion. The present study focuses on the efficacy of copper antifouling coat applied over biofilm-forming organisms in industrial cooling towers, with a special emphasis on the quorum-sensing auto inducers and the EPS structure of organisms capable of forming the biofilm. Study results demonstrated sufficiently that copper coating has strong antifouling properties and the potential to prevent the growth of biofilm-forming organisms in industrial cooling tower systems. N-Acyl Homoserine Lactones is a major component produced by gram-negative biofilm-forming organisms, and the EPS is an important component of all the organisms that form biofilm. The study findings led to the conclusion that use of copper antifouling paint can reduce biofilm formation and its signaling molecules in industrial cooling towers.

Keywords: Copper, Biofilm, Biofouling, Extra Polymeric Substance and N-acyl L-homoserine lactones.

Introduction

Cooling towers find an extensive application in many large commercial buildings and residential units, such as apartment clusters. Especially industrial power generation units and petrochemical industries need a proper cooling system to remove the excess heat typically produced during many operations. In industrial operations or in residential units, cooling tower systems is an area most vulnerable to the growth and colonization of microorganisms [12]. The cooling towers function by the principle of removing heat from the water by the evaporation of a small portion of the water that is recirculated through the cooling unit [4]. Water released from cooling systems can harbor a variety of microorganisms, organic matter, and minerals. The organic matter and mineral composites present in the water provide nutrients for the growth and colonization of microorganisms that later form biofilms that hamper the efficacy of cooling process [9].

Biofilm constitutes a consortium of cells that grow on a surface and are embedded within a thick mucilaginous matrix composed of extracellular polymeric substance [EPS]. Biofouling is considered to pose a detrimental effect in the water recirculation process of cooling tower systems which are constantly exposed to water harboring bacteria as well as nutrients in most of the industrial settings. The formation of biofilms by microorganisms has been reported frequently in industrial cooling towers, and its resistance to disinfectants is another
complication. The signaling molecules N-Acyl Homo-Serine Lactone play a vital role in biofilm formation and in the development of resistance to available disinfectants [3]. Quorum sensing has emerged as a hot topic in recent times, and it is defined as the mechanism by which different species of bacteria communicate with one another. The acyl homoserine lactone [AHL] molecules are the best-studied autoinducers that serve the purpose of primary quorum-sensing signals used by gram-negative bacteria and in the case of gram-positive bacteria, they rely on peptide-based autoinducers and structural EPS [3].

Numerous studies have reported on the efficacy of the application of copper antifouling on the superstructures or surface areas of marine transport systems, including submarines and ships, and have shown enough evidence that the application of paint mixed with copper-based antifoulants can help prevent biofouling and corrosion to a large extent. In this study, the efficacy of antifouling copper coat on biofilm-forming organisms in industrial cooling towers was studied with a special emphasis on quorum-sensing molecules and the EPS.

**Materials and Method**

**Specimen Collection:** Biofilm samples were collected from Thirumalai Chemicals Limited, Vellore, Chennai and also from Ultra Marine and Pigments Ltd, Vellore, Tamil Nadu. Using sterile scalpels, the surface biofilms found in the cooling tower panel were scrapped at four different points of each of these cooling towers and later collected in two sterile containers. The circulating water from the cooling tower was used as a transport medium for sample preservation. Next, samples were stored in thermocol ice packs for maintaining the environmental viability of microorganisms that survived in the conditions of cooling tower and were transported to the lab. Water samples from the cooling towers were also collected in sterile cans for further use in order to study the propagation of microorganisms.

**Test materials:** Galvanized stainless steel coupon and copper-coated stainless steel coupons were used as test and control samples after welding to obtain a dimension of 20x20x0.5mm.

**Experimental Setup:** Copper and stainless steel [SS] coupons were subjected to surface sterilization using 70% ethanol and were incubated as test and control systems, respectively, in both industries for a period of 45 days [6].

**Sample processing and isolation of organism:** A presumptive wet mount for the purpose of microscopic observation was performed to identify algal colonies. Heterotrophic plate count was then performed to qualitatively analyze the bacterial colonies present in the biofilm and in the water samples.
Identification of bacteria: Significant bacterial isolates were identified in accordance with Bergey’s manual that provides data such as colony characteristics, staining reaction, and biochemical properties. For further confirmation, isolates were sent to the lab at NCIM, Pune, to subject them to 16S rRNA sequencing and use the results for further analysis.

Collection of incubated coupons: Copper and SS coupons were collected using sterile ziplock bags filled with cooling tower water after an incubation period of 45 days. Macroscopic observation of patterns of biofilm formation was carried out for all the coupons.

Isolation of biofilm: Mucilaginous biofilms were collected in sterile containers by scraping the respective coupons under sterile conditions.

Extraction of N-acyl homoserine lactone, purification, and quantification: Modified physiochemical extraction and purification was carried out to analyze the samples through FTIR [5]. As much as 200ml of LB Broth was inoculated with 1 ml biofilm suspension for each experimental setup (Sample1-TCL SS, Sample 2-TCL Cu, Sample 3-UMP SS, Sample 4-UMP Cu) and incubated overnight at 35°C (100 rpm). After incubation, culture suspensions were transferred to sterile centrifuge tubes that were labeled as Sample 1-TCL SS, Sample2-TCL Cu, Sample3-UMP SS, Sample4-UMP Cu, respectively. These suspensions were subjected to centrifugation at 15,000 rpm, 4°C for 20 minutes. The supernatant was then filtered using a membrane filtration apparatus with membrane of 0.22-μm pore size. For purification, 200 ml of the filtrate obtained was mixed with 100ml ethyl acetate in 2:1 ratio and was incubated in a shaker for 10 minutes at 100 rpm [16]. Then the mixture was subjected to liquid–liquid extraction using a separating funnel for obtaining two immiscible layers using the FTIR-grade DMSO as solvent. Subsequently, the upper organic layer was collected in sterile containers. The extract was used as AHL sample and was further analyzed through FTIR.

Extraction and Quantification of EPS: Physical method was used for extracting extracellular polymeric substances [2]. Biofilm samples were transferred to sterile centrifuge tubes labeled differently (Sample 1-TCL SS, Sample2-TCL Cu, Sample3-UMP SS, Sample4-UMP Cu) and subjected to centrifugation at 20,000 rpm, 4°C for 20 minutes. The supernatant was then filtered using a membrane filtration apparatus with membrane of 0.22-μm pore size. The filtrate was used as the EPS sample, and quantification was carried out by performing protein and sugar estimation following the Phenol- Sulfuric method and Bradford method, respectively.

Invitro biofilm propagation: Microtitre Plate method was performed for studying the properties of biofilm formation from the obtained samples [11].

Test 1-A mixture of bacterial isolates from the Nutrient Agar plates (TCL-SS and Cu; UMP-SS and Cu) were transferred to sterile LB broth for all the samples.

Test 2-About 2ml of the preserved biofilm sample was transferred to a sterile test tube and further processed.

Propagation of Biofilms: The samples from Test 1 and Test 2 were cultured in an LB medium with overnight incubation. The overnight culture was then diluted 1:100 using fresh medium for biofilm assays. A quantity of 100 μL of dilution was added into each well in a 96-well dish. A total of eight replicates were maintained. The microtiter plate was then subjected to incubation for up to 24 hours at 37°C. After incubation, unattached cells were dumped out of the plate by turning the plate and rinsing thoroughly by gently submerging in a small tub of water. This process was repeated one more time to remove unattached cells, and media components were stained in the next step, thereby significantly lowering the background staining. About 125 μL of 0.1% solution of crystal violet was added into the water of each well of the microtiter plate. The microtiter plate was subjected to incubation at room temperature for 10 to 15 minutes. Then the plate was rinsed 3 to 4 times with water and blotted onto a stack of paper towels to remove excess cells and dye. The microtiter plate was turned upside down and dried for few hours or overnight and later photographed after drying.

Quantification of the Biofilm: A quantity of 125 μL of 30% acetic acid was added to water in each well of the microtiter plate for solubilization of CV. The microtiter plate was kept undisturbed at room temperature for 10 to 15 minutes. Next, 125 μL of solubilized CV was added to a new flat-bottomed microtiter dish, and the absorbance was quantified in a plate reader at 550 nm using 30% acetic acid in water as the blank.

Statistical Analysis: The z score test for the two population proportions was used for determining the significance of difference between the biofilm-forming potentials of Test 1 and Test 2. The test of significance
was set at <.05. Two-tailed hypothesis was selected for this study.

Results

Identification of Biofilm sample: The algal colonies obtained were identified as Nostoc spp, Chlorella spp, Lyngbya spp, and Synechococcus spp. A total of 35 x 10^6 CFU/ml and 40x10^6 CFU/ml was obtained from the samples collected from TCL and UMP, respectively. Three colonies each from TLC and UMP were isolated and further subjected to processing for obtaining pure cultures. Table 1 and 2 show the colony morphology of organisms isolated from the TCL and UMP samples. Fig. 5 to 10 show the colony morphology of microorganisms from the TCL and UMP samples on a nutrient agar medium.

<table>
<thead>
<tr>
<th>Colony</th>
<th>Size</th>
<th>Shape</th>
<th>Elevation</th>
<th>Margin</th>
<th>Opacity</th>
<th>Surface</th>
<th>Chromogenesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micrococcus luteus</td>
<td>2-4 mm</td>
<td>Round</td>
<td>Raised</td>
<td>Entire</td>
<td>Opaque</td>
<td>Yellow</td>
<td>Yellow</td>
</tr>
<tr>
<td>Burkholderia cepacia</td>
<td>1-2 mm</td>
<td>Round</td>
<td>Convex</td>
<td>Entire</td>
<td>Opaque</td>
<td>Creamy white</td>
<td>None</td>
</tr>
<tr>
<td>Bacillus megaterium</td>
<td>1-2 mm</td>
<td>Round</td>
<td>Raised</td>
<td>Entire</td>
<td>Translucent</td>
<td>White</td>
<td>None</td>
</tr>
</tbody>
</table>

Table 1 Colony morphology of organisms from TCL

<table>
<thead>
<tr>
<th>Colony</th>
<th>Size</th>
<th>Shape</th>
<th>Elevation</th>
<th>Margin</th>
<th>Opacity</th>
<th>Color</th>
<th>Chromogenesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacillus subtilis</td>
<td>1-2 mm</td>
<td>Round</td>
<td>Raised</td>
<td>Rough</td>
<td>Opaque</td>
<td>White</td>
<td>None</td>
</tr>
<tr>
<td>Sarcina aurantiaca</td>
<td>2-4 mm</td>
<td>Round</td>
<td>Raised</td>
<td>Entire</td>
<td>Opaque</td>
<td>Orange</td>
<td>Orange</td>
</tr>
<tr>
<td>Pseudomonas putida</td>
<td>2-4 mm</td>
<td>Round</td>
<td>Convex</td>
<td>Entire</td>
<td>Translucent</td>
<td>White</td>
<td>None</td>
</tr>
</tbody>
</table>

Table 2 Colony morphology of organisms from UMP

![Figure 5 Colony 1](image1.png)  ![Figure 6 Colony 2](image2.png)  ![Figure 7 Colony 3](image3.png)

![Figure 8 Colony 4](image4.png)  ![Figure 9 Colony 5](image5.png)  ![Figure 10 Colony 6](image6.png)
Estimation of EPS:

Sugar Estimation by Phenol Sulfuric Method: Sugar content in coupons obtained from TCL industries was estimated to be 4.89/100ml in SS coupons and 3.14/100ml in Cu coupons. A significant decrease was observed in sugar concentration. Sugar content in coupons collected from UMP industries was estimated to be 1.99/100ml in SS coupons and 1.07/100ml in Cu coupons. A very minute decrease was observed in sugar concentration. Fig. 11 is a graphical representation of sugar estimate of TCL (SS, Cu) and UMP (SS, Cu).

![Sugar Estimation Graph](image1)

Figure 11 Graphical representation of sugar estimate of TCL (SS, Cu) and UMP (SS, Cu)

Protein Estimation by Bradford’s Method: The protein content in coupons from TCL industries was estimated to be 4.3/100ml in SS coupons and 3.98/100ml in Cu coupons. A slight decrease in protein concentration was observed. The protein content in coupons from UMP industries was estimated to be 2.14/100ml in SS coupons and 1.22/100ml in Cu coupons. A significant decrease in protein concentration was observed. Figure 12 is a graphical representation of estimate protein content in TCL (SS, Cu) and UMP (SS, Cu) samples.

![Protein Estimation Graph](image2)

Figure 12 Graphical representation of protein estimate of TCL (SS, Cu) and UMP (SS, Cu)
Quantification of AHL by FTIR: The AHL extract of two samples of SS and Cu from TCL and UMP (Sample 1-TCL SS, Sample 2-TCL Cu, Sample 3-UMP SS, Sample 4-UMP Cu) were subjected to FTIR analysis, and the observations are presented as follows.

Sample 1-TCL SS
Sample 3-UMP SS:

Figure 15 Graphical Representation of FTIR spectra for UMP SS

Sample 4-UMP Cu:

Figure 16 Graphical Representation of FTIR spectra for UMP Cu
### Table 3 FTIR analysis for TCL SS

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Position</th>
<th>Intensity</th>
<th>Frequency Range (cm(^{-1}))</th>
<th>Functional Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1739.48</td>
<td>53.6007</td>
<td>2000-1500</td>
<td>C=O lactone ring</td>
</tr>
<tr>
<td>2</td>
<td>1643.05</td>
<td>52.8837</td>
<td>2000-1500</td>
<td>C-H (alkyl)</td>
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<td>3</td>
<td>1375.96</td>
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<td>C-O (aromatic)</td>
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<tr>
<td>4</td>
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<tr>
<td>5</td>
<td>1045.23</td>
<td>92.7753</td>
<td>1500-1000</td>
<td>N=H (amine)</td>
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### Table 4 FTIR analysis for TCL Cu

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<tr>
<td>1</td>
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<td>C=O lactone ring</td>
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<tr>
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<td>1643.05</td>
<td>56.3256</td>
<td>2000-1500</td>
<td>C-H (alkyl)</td>
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<tr>
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<td>1374.03</td>
<td>55.2883</td>
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<tr>
<td>4</td>
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<td>C=O lactone ring</td>
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<tr>
<td>5</td>
<td>1045.23</td>
<td>65.7366</td>
<td>1500-1000</td>
<td>N=H (amine)</td>
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### Table 5 FTIR analysis for TCL UMP SS

<table>
<thead>
<tr>
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<th>Frequency Range (cm(^{-1}))</th>
<th>Functional Groups</th>
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<tbody>
<tr>
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<td>1739.48</td>
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<td>1643.05</td>
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<td>1374.03</td>
<td>62.088</td>
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<td>4</td>
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<td>C=O lactone ring</td>
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<td>1045.23</td>
<td>72.915</td>
<td>1500-1000</td>
<td>N=H (amine)</td>
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### Table 6 FTIR analysis for UMP Cu

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<th>S. No.</th>
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<th>Frequency Range (cm(^{-1}))</th>
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### Table 7 Absorbance Reading at 550nm for Test1

<table>
<thead>
<tr>
<th>Replicates</th>
<th>TCL SS</th>
<th>TCL Cu</th>
<th>UMP SS</th>
<th>UMP Cu</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>0.738</td>
<td>0.622</td>
<td>0.733</td>
<td>0.107</td>
</tr>
<tr>
<td>2</td>
<td>0.991</td>
<td>0.534</td>
<td>0.688</td>
<td>0.152</td>
</tr>
<tr>
<td>3</td>
<td>1.02</td>
<td>0.213</td>
<td>0.652</td>
<td>0.278</td>
</tr>
<tr>
<td>4</td>
<td>0.866</td>
<td>0.610</td>
<td>0.991</td>
<td>0.497</td>
</tr>
<tr>
<td>5</td>
<td>0.931</td>
<td>0.332</td>
<td>1.02</td>
<td>0.442</td>
</tr>
<tr>
<td>6</td>
<td>0.986</td>
<td>0.634</td>
<td>0.866</td>
<td>0.248</td>
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Table 8 Absorbance Reading at 550nm for Test2

<table>
<thead>
<tr>
<th>Replicates</th>
<th>TCL SS</th>
<th>TCL Cu</th>
<th>UMP SS</th>
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Microtitre Biofilm Formation Assay: The adsorption readings at OD sub 550 of cultures from Test 1 and Test 2 after staining the formed biofilm samples with crystal violet helped to identify a substantial difference between the isolates of SS and Cu coupons collected from TCL and UMP.

The Z score test was carried out for the two population proportions to determine the significance of difference between the biofilm-forming capabilities of Test 1 and Test 2, and results were found to be significant at p < .05 for both the tests.

Discussion

Crude biofilm and water samples were collected from Thirumalai Chemicals Limited (TCL) and Ultra Marine and Pigments Ltd (UMP), Vellore. Preliminary microscopic examination revealed algal colonies such as Nostoc spp, Chlorella spp, Lyngbya spp, and Synechococcus spp. They occur widely in aquatic habitats and form active biofilms due to production of alkaloid compounds and intense pigmentation on surfaces exposed to moisture (Sanmartín et al, 2010).

A homogenized form of biofilm and cooling-tower-water samples was subjected to heterotrophic plate count using LB media for enumeration of bacterial colonies. Three colonies exhibiting maximum characteristic growth from both samples were selected and subjected to gram staining, motility, and biochemical tests (Indole, Methyl Red, Voges Proskauer, Citrate, and TSI) for identification. The process of identification revealed Micrococcus luteus, Burkholderia cepacia, and Bacillus megaterium from TCL, and Bacillus subtilis, Sarcina aurantiaca, and Pseudomonas putida from UMP. Further confirmation of the isolates was done by subjecting the identified organisms to 16SrRNA sequencing.

Micrococcus luteus is a gram-positive as well as gram-variable coccus; it is as a protrophic and nonmotile bacteria residing in water released by industrial systems. In a study [15], the biofilm-forming abilities of the organism in a microtiter plate test was studied. Burkholderia cepacia is an aerobic gram-negative bacillus that occurs in various aquatic environments. It is of low virulence and is a frequent colonizer of fluids. In a study [13], it was reported that even the non-mucoidal stage of the organism is capable of producing biofilms effectively. Bacillus megaterium is considered a gram-positive, endospore-forming, rod-shaped, aerobic, and saprophytic bacteria that produces a variety of enzymes and proteins. Currently, active research is taking place to study this organism’s capacity for biofilm formation after manipulation of its genome for bioremediation. Bacillus subtilis are a gram-positive, aerobic, rod-shaped, and catalase-positive bacterium. In study [10] the extracellular matrix produced by Bacillus subtilis B-1, an environmental strain capable of forming robust floating biofilms, was studied.

Sarcina aurantiaca are gram-positive bacteria that form characteristic packet of cells in both solid and liquid media. They produce a characteristic orange pigmentation [1] studied the diverse genomic profiles
and heterogeneity of the biofilm capabilities of Sarcina aurantiaca and other archaic organisms. Pseudomonas putidaare a rod-shaped, flagellated, gram-negative bacteria that occurs in most of the soil and water habitats. A study [7] revealed the complex water-soluble EPS produced by the organism containing polysaccharides in a larger proportion.

For testing the efficacy of copper antifouling coat on biofilm, a control (Stainless Steel-SS) and test (Copper-Cu) system was installed at the cooling tower panel. We ensured the SS and Cu coupons were subjected to the same water circulation system. This setup was followed for both the industries. Coupons were incubated for 45 days for the completion of primary attachment assay and microcolony formation. The autoinducers [N-Acyl Homoserine Lactones] and the tensile EPS structure are the two major compounds produced during these stages. After the 45-days incubation, the biofilm-laden SS and Cu coupons were subjected to the extraction of quorum-sensing molecules as well as the EPS structure for both TCL and UMP samples. AHL molecules were further analyzed by FTIR.

The SS and Cu AHL extracts from TCL were analyzed for the presence of AHL functional groups, which included the C=O lactone and a N-H amine group. The C=O lactone ring from SS exhibited peak intensity at 53.6007 and 74.6818 at two different frequency ranges. The N-H amine group was at a peak intensity of 92.7753, and for the Cu, it was 28.799; for the lactone rings, 46.5075; and for the N-H group, 65.7366. This occurrence of the N-H amine group was the fingerprint region and confirmed the decrease in AHL activity between the biofilm sample extracted from SS and Cu coupons. Subsequently, the SS and Cu AHL extracts from UMP were analyzed for the presence of AHL functional groups, where the C=O lactone ring from Cu demonstrated peak intensity at 30.2544 and 46.7873 at two different frequency ranges. The N-H amine group occurred at 65.4578. For the SS, it was 38.2943, and it was 56.9419 for the lactone rings while 72.915 for the N-H group. The second peak of the lactone ring exhibited higher intensity in the Cu sample, but the N-H fingerprint region exhibited a decreased peak intensity. These results confirm the decrease in AHL activity between the biofilm samples that were extracted from SS and Cu coupons.

The EPS structure is composed of only two major components-sugars and protein. Total carbohydrate concentration was estimated by the phenol-sulfuric method, and it was found to be 4.89/100ml and 3.14/100ml in SS and Cu coupons, respectively, for the TCL sample, and 1.99/100ml and 1.07/100ml in SS and Cu coupons, respectively, for the UMP sample. Total protein was estimated to be 4.3/100ml and 3.98/100ml in SS and Cu coupons, respectively, for the TCL sample and 2.14/100ml and 1.22/100ml in SS and Cu coupons, respectively, for the UMP sample. A considerable difference of significance was found in the total carbohydrate estimated and a slight difference in protein content as estimated. When the total estimated values of carbohydrate and total protein were added, a significant difference in the concentration of the EPS extract was observed. Microtiter biofilm formation was performed for assessing the biofilm-forming capabilities of bacterial isolates from the TCL and UMP samples, and the method allowed for an invitro propagation of the biofilm sample. The isolated bacterial isolates from SS and Cu coupons were taken as Test 1. Upon propagation, staining with crystal violet, and subsequent calculation of absorbance rate in ELISA plate reader, the total absorbance of the 8 replicates was found to be 8 (SS) and 3 (Cu) for TCL. While it was 7 (SS) and 2 (Cu) for UMP. A homogenized sample of biofilm with the cooling tower water was considered as Test 2. Upon propagation, staining with crystal violet, and subsequent calculation of absorbance rate in ELISA plate reader, the total absorbance of the 8 replicates was found to be 7 (SS) and 3 (Cu) for TCL and it was 6 (SS) and 2 (Cu) for the UMP sample.

A significant decrease in the biofilm-forming potential was observed between the SS and Cu samples for both Test 1 and Test 2. This might be due to the result of reduced activity emphasized by the copper antifouling coat present, in the autoinducer molecules as well as in the EPS structure. Z-score test was used to determine the significance of difference between the biofilm-forming capabilities of both Test 1 and Test 2 samples and the result was significant at p < .05 for both these tests. With the results obtained from the study, it can be concluded that copper coating demonstrated active antifouling efficacy against biofilm-forming organisms isolated from the cooling tower system. Hence, further studies on other autoinducer molecules produced by such organisms should be undertaken with a special focus on the signal molecules–targeted therapy and in quorum-sensing manipulations.
Conclusion

The uncontrollable formation of biofilm in industrial cooling towers has been a major problem for the past few decades. Chlorine and other biochemicals are the most preferred antifouling agents to curtail the growth of sessile organisms. However, current research shows these chemicals do not exhibit adequate efficacy due to the emergence of resistance in the biofilm-forming organisms against such agents. Coating copper as an antifouling agent on the surface of the cooling tower has proved copper to be a potential proactive agent against biofouling. From the findings of study, it was concluded that effective use of copper antifouling paint can significantly reduce biofilm formation and its signaling molecules in industrial cooling towers and has the potential to create newer, more effective alternatives for tackling existing biofilm problems in cooling towers and other similar setups.

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Conflict of Interest: NA

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Role of Medicinal Plants in the Prevention of Covid-19 Pandemic

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Abstract

Coronavirus disease 2019 (COVID-19) is a life-threatening global health scenario. The WHO (World Health Organization) has announced this disease as global issue. The severity of this disease causes highest death rates from December 2019-October 2020 world wide. There is an urgent need to develop medicines and vaccine to prevent the immune system of human. Medicinal plants and plant based drugs play a major role in preventing by provoking the immune system. This review discusses about the major global issue pandemic coronavirus disease (Covid -19) and the traditional medicines as preventive and curative agent in treating this global health issue.

Keywords: COVID-19, medicinal plants, preventive measures.

Introduction

In the beginning stage the spreading of coronavirus was identified through the blood, sputum sample and the excreta of diseased patients. Coronavirus virion particles measured the length of 80–140 nm protein spikes like projection around the virion layer, were observed through the electron microscope. The arrangement of corona virus is single-stranded RNA with 30 kb in length, gene sequence matched with previously found coronavirus gene sequence. RNA Polymerase is responsible for higher proliferation rate of coronavirus.

Coronavirus is novel virus emerged from the virus causes respiratory issues already present hence its mutation level is unexpectedly high. With structure identification it can be matched and given for sequence similarity by using the bioinformatics tools such as CLUSTALW, BLAST and other sequence similarity tools and with the basic identification tools we can design a drug against the deadly virus. The use of herbal plants to withstand human health is a biggest challenge according to doctors in ayurveda, siddha to find a medicinal plant which are of with many complex molecules those are not easy to derive. The medicinal drugs can be derived from turmeric, ginger, cinnamon, cloves, tulsi, fenugreek and fennel seeds. These are important man-found medicines to cure many complicated health ailments. With the aid of scientists and researchers there is an urgency to find the natural ways to cure this disease. And to make strong anti-COVID-19 herbal medicines from endless plant materials present. Undoubtedly these medicinal plants, aids in reducing the patients suffering from illness through the COVID-19.
Use of Medicinal Plants: Necessity to find the plants which are different in their dosage and the use of plant parts some of the examples are: Thumbai poo (leucas aspera), karpoo ra valli (Coleus amboinicus), Tulsi (Ocimum tenuiflorum), Gentian (Bitter root), Goldenseal, Ginseng Musumusukkai (Ocimum tenuiflorum) [4].

Ginger (Zingiber officinale Rose): Ginger (Zingiber officinale Rosc.) belongs to the family Zingiberaceae. The anti-oxidant and anti-arthritic compounds of ginger and its components utilized in various research oriented tests. Strengthening the body’s defense mechanism by improving the antioxidant property will undoubtedly cure many chronic diseases and disorders. 6-Shogaol obtained from ginger is the important compound aids in relieving the patients from respiratory issues. The alakaloid irritant taste from ginger also aids in clearing respiratory issues thus it is also known to help preventing from COVID-19 [5].

Curcumin (Curcuma Aromatica): Turmeric consists many medicinal properties includes, anti-cancer, antiseptic and antibacterial and anti-fungal which helps in hindering the molecules responsible for the diseases. Its antioxidant activities helps us in cleansing and repairing the digestive disorders. Anti-thrombotic properties of Curcumin may also helps in clearing the mucous in lungs so that relieving the oxygen supply to the entire body [6].

Ashwagandha (Withania Somnifera): The natural product Withaferin A is isolated from Ashwagandha (Withania somnifera) mostly obtained to treat many diseases such as common cold, gynaecological disorders, and even infertility issues. It possess antiviral activity against many viral diseases and also against COVID-19 [7]. Molecular docking studies shows that as per YASARA scoring out of 28 compounds from W. somnifera (Ashwagandha) only the major compounds Withanoside V and Somniferine showed significant binding affinity as compared to native coronavirus. Withanoside V showed highest binding energy of 10.32 kcal/mol [9].

Liquorice (Glycyrrhiza Glabra): The glycyrrhizin is a compound present in licorice plant for covid-19 is not clearly studied. This compound Glycyrrhizin inhibiting the tyrosine kinase enzymatic cellular signalling pathways responsible to develop tumor and induce cancer cell proliferation in uncontrollable manner. A glycone metabolite 18β glycyrrhetinic acid up-regulates the gene expression of the molecules helps in increasing the macrophage s tremendously which engulfs the antigen. Glycyrrhizin helps in increasing the nitrous oxide level capable to destroy viruses. The research carried on this plant shows that glycyrrhizin a natural compound enhances the level of nitrous oxide synthase it induces the high rate of apoptosis in the vero cells in culture medium. HIV-1 patients and patients with chronic hepatitis C virus are treated with the natural compound glycyrrhizin shows the positive recovery graph. However the toxic level of this particular compound is also studied in different ways because the variation in dosage level can lead to unexpectable complications in Covid patients as well as normal sick patients.

Tulsi (Ocimum Sanctum L): In Ayurveda treatment tulsi plant is majorly called as holy plant and holy water for that ability of healing and compounds it possesses and treats major health disease and disorders. Even in the covid period people are advised to take handful of basil leaves and boiled water with basil leaves. health complications. In the Indian medicinal system tulsi leaf extracts are known to cure bronchitis, rheumatic arthritis, and asthma. It is recorded in the research that tulsi plant has the binding property to destroy covid-19 deadly disease [11].

Cinnamon (Cinnamumom Zeylanicum): Cinnamon (Cinnamomum zeylanicum, and Cinnamon cassia) Lauraceae family one of most important tree containing bark with endless medicinal compounds. By considering the medicinal properties of the bark it is used in Indian cooking everyday to cure digestive disorders. Cinnamon primarily contains essential oils and other derivatives, such as cinnamaldehyde, cinnamic acid, and cinnamate which are taken to heal gynaecological disorders and enhancing the immune system by keeping the reproductive organs healthy. People often use it for weight loss procedures by putting it in boiling water and taken orally. It is also used for cosmetic purposes in ancient medicines to cure pimples and clear people with many skin infections. [13].

Baikal Skullcap (Scuttelaria Baicalensis): Baicalin, a major constituent of the plant, Bioactive compounds such as baikalin, wogonoside, are extracted for medicinal purposes from the root of this important medicinal plant S. baikalensis. It has been taken orally to treatment many digestive disorders such as diarrhea, vomiting and gastric problems. It is also known to
treat respiratory problems that’s why it is it has been researched and revealed that it is a potent medicine against coronavirus causing COVID-19. People with insomania and hypertension are advised to take this medicinal drug. This baicalin plays a major role in inhibiting the proliferating the HIV-1 virus[14].

**Tinospora Cordifolia (Giloy, Guduchi):** Giloy or Guduchi, scientific name Tinospora cordifolia is one of the most flexible restoring bushes. This is the simple herb utilized as a part of Ayurvedic medication. It is considered as best rasayana in its strong flexibility. It consists many biologically important phytochemicals including lactones, alkaloids, glycosides, steroids, sesquiterpenoid, diterpenoid, aliphatic compounds, phenolics, polysaccharides and flavonoid which play immunomodulatory activity in human body. It has anti-diabetic, antioxidant, Anti-inflammatory, antiperiodic, antispasmodic, anti-arthritic, anti-allergic, antimicrobial, anti-osteoporotic, anti-toxic, anticancer, anti-HIV, wound healing. Its alkaloid components including tinosporin, tetrahydropalmatine, choline, palmatine and magnoflorine are in high demand, it also has protective role against aflatoxin induced nephrotoxicity. This herb has broad activity plays important role to improve our immune system to fight against infectious diseases. Generally, extract (juice) of Giloycan be taken orally. The following herbal formulation is found to be helpful for preventing and curing COVID-19 disease [15].

**Neem (Melia Azadirachta L.):** Neem has strong bitter taste known to cure many health disorders, taken orally in empty stomach to flush out the toxins and kill worms in the stomach. The juice extract has been used to treat many skin infections. It is well for its anti-plasmodic activity against plasmodium spread by mosquitoes. Neem usage in traditional ways of curing diseases for more than two thousand years. Urinary, respiratory and digestive systems can be treated with the use of neem extracts to detoxify and enhance its functioning capacity. The bitter taste of neem helps in clearing the mucous of lung while having common cold by the way of steaming and taken as preventive medicine for COVID-19[16].

**Conclusion**

Traditional plants has many beneficial properties to explore, conducting extensive research necessary for experimenting and development for the healthy society. The proper use of medicinal plants can heal and help people with many disorders and diseases. The use of modern medicine can be used for emergency cure and its side-effects are also known and sometimes become incurable. Traditional herbal medicines help people in treating skin diseases such as psoriasis, leprosy and digestive disorders such as dysentery, gastric and even many types of cancer. The medicine from such herbal plants are used in many research institutes to treat deadly diseases such as cancer, cardiac arrest, memory loss, anaemia, insomnia. During this COVID scenario all these are used as preventive agent and are followed till date. Many plants possess beneficial antiviral compounds now it is used regularly by people to treat COVID disease. The proper utilization of traditional medicines against COVID-19 Pandemic disease would help people in many ways to safe guard and elevate the immune system.

**Ethical Clearance:** Nil

**Source of Funding:** Meenakshi Academy of Higher Education and Research, Chennai, India

**Conflict of Interest:** Nil

**References**


Effect of Various Sweeteners on Cariogenicity Features of Streptococcus Mutans: In-Vitro Study

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Abstract

Background: Dental caries is a global pandemic health crisis, that is caused by diet containing refined sugar. Many alternative sugars in the market have been used as a substitute for table sugar. But there is paucity in literature regarding the cariogenicity properties of these.

Aim: To assess the effect of various alternative sweeteners on Streptococcus mutans growth and acidogenicity.

Study Design: Laboratory based In-Vitro Study.

Materials and Method: Ten percentage solutions of refined sugar, brown sugar, jaggery, palm jaggery, palm sugar, honey, Rare Sugar Sweet were used as test products to assess the growth of Streptococcus mutans in terms of the optical density using a spectrophotometer, Colony forming units(CFU) in Mutans-sanguis agar (MSA) and acidogenicity by measuring the pH. Statistical Analysis Used: Non-parametric test of significance with p value <0.05 was performed. Results: S. mutans growth in the honey and D-Psicose were significantly lower than that in the sucrose, while greater than that of xylitol and placebo group (p < 0.05). pH after 48 hours was statistically significant between the groups and dropped below the 5.5 in all the test groups except honey and D-Psicose. Honey had least cariogenicity in terms of growth of S.mutans and acidogenicity. Rare sugar sweet had S.mutans growth and acidogenicity less than sucrose.

Conclusion: Honey had least S. mutans growth and acidogenicity hence, can be regarded as safe alternatives for other commercial sweeteners in the market.

Keywords: D-Psicose, Cariogenicity, Acidogenicity, Optical density, Colony Forming Units.
It seems impractical for the complete restriction of sugar given the human preference for the sweet food item. Instead, cariogenic sugar can be substituted with other sweetening agents that might be less cariogenic.

Honey could be an alternative for sucrose as it is found to be non-cariogenic or less cariogenic. Brown sugar, jaggery, palm jaggery, palm sugar are alternatives to refined sugar that are functional foods and have health benefits. The presence of reducing sugars, significant quantities of minerals and other minor constituents makes ‘alternative sugar’ looks promising.

Xylitol, another alternative, is a naturally occurring non-fermentable five-carbon sugar alcohol, which cannot be converted to acids by oral bacteria, thus it helps to restore a proper alkaline/acid balance in the mouth.

With current advancements in food processing technology, many attempts have been made to find a novel “caries-preventing sweetener” or “anti-cariogenic sweetener”. One such recent product manufactured in Japan is D-psicose. D-Psicose, a Japanese product is a low-calorie sweetener, which claims to controls bacterial growth and acid production (anti-cariogenic), even in combination with existing sweeteners.

There are very few studies published to explore the cariogenic potential of these sweeteners. Hence an in-vitro study was conducted to assess the effect of various alternative sweeteners such as refined sugar, brown sugar, jaggery, palm sugar, palm jaggery, honey and D-Psicose on cariogenicity features of Streptococcus mutans.

Methodology

An in-vitro study was conducted on S. mutans MTCC 890 strain in the Central Research Laboratory, after obtaining the ethical approval. The cariogenic potential of Refined white sugar, Brown sugar, Jaggery, Palm sugar, Palm jaggery (Karupatti), Commercial honey, D-Psicose with sucrose (Rare sugar sweet®, Japan), Sucrose as Positive control (Lab grade) and Xylitol as a negative control (Lab Grade) was assessed.

a. Preparation of Test solutions: Ten percent of each test solution was prepared by mixing 10 grams or 10 mL of the test product in 100mL of distilled water and solutions were then filtered, sterilized through a 45- micron size pore filter and stored at 4°C. This solution was used for the preparation of agar media using Mutans Sanguis Agar.

b. Bacterial growth as a measure of Optical Density: Sterile 96-well microtiter plates were taken and wells were labeled as Tests and controls. In the test wells, 10 microliters of S. mutans from the overnight culture were added along with 290 microliters of MSA-sweeteners. In the control wells, 300 microliters of the MSA-sweetener dilution without bacteria were added. The absorbance of each well read at 540 nm in a spectrophotometer after an incubation period of 48 hours at 37°C. The test was done in triplicate. The final test optical density was calculated by subtracting the optical density of the test minus the optical density of the control of each product used.

\[ \text{OD}_{\text{final}} = (\text{OD}_{\text{test}} - \text{OD}_{\text{control}}) \]

c. Bacterial viability in terms of Colony-forming units (CFU): The effect of sweeteners on S. mutans viability was assessed. Bacterial cultures of all sweeteners from the microplate wells were plated on the MSA agar plate. The number of CFU for each sweetener was measured using an automated colony counter after incubating it for 48 hours at 37°C. The test was done in triplicate.

d. Sweeteners influence on S. mutans acidogenicity: The pH of the test solutions in the micro-titre plate was measured at baseline and the end of 48 hours using a digital pH-meter. The test was done in triplicate. To know the media characters at the end of 48 hours, a separate media solution with a microbe was prepared and kept as control.

Statistical tests: The colony count was transformed into \( \log_{10} \) CFU for analysis. The data were analyzed using SPSS software version 19.0. by a statistician who was blinded to the groups. Non-parametric tests of significance were performed. In all tests, a P-value of <0.05 was considered as the level of statistical significance.

Results

a. Inter-group comparison of optical densities: The ascending order of the optical density of the sweeteners is as follows, xylitol, honey, palm sugar, refined sugar, brown sugar, rare sugar sweet, jaggery, palm jaggery and sucrose. In the post-hoc analysis, the optical density of palm jaggery was higher when compared to other test sweeteners used in this study and this difference was statistically significant (p<0.05). (Table 1)
Table 1: Inter-group comparison of Optical density, \( \log_{10} \) CFU and pH

<table>
<thead>
<tr>
<th>Group</th>
<th>Optical Density (Final) Mean±SD</th>
<th>( \log_{10} ) CFU/mL Mean±SD</th>
<th>pH before Mean±SD</th>
<th>pH After Mean±SD</th>
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<td>Refined sugar</td>
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<td>Brown Sugar</td>
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<td>1.11±0.48</td>
<td>4.99±0.01</td>
<td>7.2±0.1</td>
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<td>Palm sugar</td>
<td>0.57±0.09</td>
<td>4.99±0.01</td>
<td>7.23±0.2</td>
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</tr>
<tr>
<td>Jaggery</td>
<td>0.97±0.07</td>
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<td>7.2±0.1</td>
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<td>Honey</td>
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</tr>
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<td>D-Psicose</td>
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<td>Sucrose</td>
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</tr>
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<td>p-value</td>
<td>0.001*</td>
<td>0.002*</td>
<td>0.802</td>
<td>0.003*</td>
</tr>
</tbody>
</table>

b. Inter-group comparison of \( \log_{10} \) of Colony Forming Units per mL: The ascending order of the optical density of the sweeteners is as follows, xylitol, honey, rare sugar sweet, jaggery, brown sugar, palm sugar, refined sugar and sucrose. Honey and rare sugar sweet had \( \log_{10} \) CFU/mL when compared to refined sugar, brown sugar, palm sugar, palm jaggery, jaggery and sucrose, while it was higher in both these sweeteners when compared to xylitol. This difference in colony-forming units in honey and rare sugar sweet with other test products was statistically significant (p<0.05) (Table 1).

c. Intra and Inter-group comparison of pH: The pH at baseline was around 7.2 for all the sweeteners, and even though there was a slight difference in pH, this was not statistically significant (p=0.802). The pH of media without sweetener added (Control) was 8.6 at the end of 48 hours, suggesting that the sweeteners were responsible for the change in pH. The pH after 48 hours for various sweeteners were 5.4±0.2 for refined, brown sugar and jaggery, 5.2±0.1 for palm jaggery, palm sugar, 5.9±0.2 for honey, 5.6±0.2 for rare sugar sweet, 5.2±0.2 for sucrose, 6.6±0.1 for xylitol and 6.8±0.1 for placebo. The difference in pH at end of 48 hours between the sweeteners was statistically significant (p=0.003). All the test products except xylitol, honey and rare sugar sweet had a pH less than 5.5, which is regarded as the critical pH for demineralization of enamel.

![Figure 1: Preparation of Test solutions](image1)

![Figure 2: Bacterial growth as a measure of Optical Density using spectrophotometer](image2)
Dental caries is caused by the interaction of the agent, host and substrate. The substrate is particularly refined carbohydrates in the diet. The refined carbohydrates in the diet are easily metabolised by S. mutans into inorganic acids, which causes demineralization, eventually leading to cavitation. The nature of the substrate, the frequency and amount of sugar consumed affects the initiation and progression of dental caries. [12] This has led to an intensive search for an alternative sweetener without cariogenicity. Advancement in food technology and a rise in health consciousness has led to the launch of many new alternative sweeteners.

One such novel alternative is D-Psicose which is marketed as ‘Rare Sugar sweet’ in Japan which is a C-3 epimer of D-fructose, with higher solubility, smooth texture, desirable mouthfeel and has 70% of the sweetness of sucrose with only 0.2 kcal/gm. [13] It has a low glycaemic index and prevents postprandial hyperglycaemia. [14]

In India, many traditional sugars such as brown sugar, jaggery, palm jaggery, palm sugar and honey have been consumed regularly for centuries. Parents substitute these sugars in common food items and drinks for their children’s well-being, as they are regarded as a safer alternative to that of refined sugar. Hence, these sugars were tested for cariogenicity in this study.

Sucrose has been regarded as arch-rival for dental caries hence used in this study as a positive control. [15] Xylitol was used as a negative control as it is an alternative sugar as it is not metabolised by S. mutans to produce acids. [16]

Cariogenicity of food items can be assessed by four parameters viz cariogenic plaque forming ability of the substrate, acid forming potential, clearance time and ingestion time. [17] Since this is an in-vitro study only, the plaque forming ability of the substrate and the acid forming potential was recorded.

Plaque forming ability of the substrate was assessed by measuring the growth of Streptococcus mutans. Triangulation was done between optical density and colony forming units to obtain a good calibrated growth estimate. The acid forming ability was assessed using a calibrated digital pH meter.

In this study, ten percentage of solutions were prepared, for all the test products. This was done to ensure that the results are comparable to the study conducted by Stephen in 1940, where 5.5, which is the critical pH of demineralization of enamel was determined using 10% solutions of glucose/sucrose. [18]

In this study, natural honey, had lower OD as well as CFU when compared to that of the positive control and the pH did not drop below 5.5. This suggests that honey can be a potential alternative to refined sugar. Natural honey contains various amino acids, vitamins, minerals and enzymes along with 95–99% sugar, which is predominantly fructose and glucose. [19] Honey has anti-inflammatory, antibacterial, anti-viral, antifungal, anti-oxidant properties and promotes wound healing, protects from gastrointestinal infections. [20] The topical application of honey caused less fall in pH when compared to sucrose solution among orthodontic patients. [21]
Both refined sugar and other sweeteners except honey which are tested in-vitro might be cariogenic as they contain fermentable carbohydrates. [22] But, the tested alternative sweeteners contain reducing sugars with significant quantities of minerals like Calcium, Copper, Iron, Manganese, Chromium, Magnesium, Potassium, Niacin, Vitamin B6, and other minor constituents, which makes them, nutritionally and functionally different from refined sugar. [23] Besides, the processing of food in the oral cavity depends on its properties and oral physiology. [24] The cariogenic potential of these traditional sugars is a subject of debate and further in-vivo evidence is needed to determine its cariogenicity.

The novel product D-Psicose has bacterial growth less than that of positive control and the pH was above 5.5. Hence might be a potential alternative to refined sugar, for the prevention of dental caries. The study is the first of its kind to assess the cariogenicity features of the tested sweeteners using two key determinants of cariogenicity and triangulation did to assess the S. mutans growth increases the reliability of the results. This is a preliminary In-vitro study, hence the results have to be interpreted with caution. To conclude the cariogenicity of the sweeteners in humans in-vivo studies is required.

CONCLUSION:

Among the tested traditional sugars, honey seemed to have a less cariogenic effect when compared to that of refined sugar. Besides, the novel sweetener D-Psicose as well as the potential for being suggested as an alternative. The other tested traditional sugars though seem as cariogenic as refined sugar, the cariogenicity is still debatable. Hence, further In-vivo studies are necessary to determine the cariogenicity of these sugars in humans by measuring all four parameters for the cariogenicity of food.

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Molecular Testing and Future Prespective Method of nCOV-19

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Abstract

A respiratory disease caused by the corona virus is SARS-CoV-2 spread from China to all over the world. The pathogen causes serious health hazards to humankind from infectious bats. The symptoms range from mild infection to serious problems and life threatening incidence occur globally. The testing method should be more rapid for correct diagnosis and clinical laboratories play a pivotal role in COVID-19 testing, providing presumptive diagnosis at the earliest and nucleic acid based amplification techniques such as RT-qPCR delivering high fidelity reports. The rapid point-of-care testing is crucial in handling such emergency to enhance large-scale surveillance to aid quarantine of suspicious cases and thereby encasing the contagious spread. The review focuses on RT-qPCR and future method such as LAMP assay and nano based techniques are suggested for efficiency and to overcome the false results.

Keywords: RT-qPCR, Molecular method, LAMP, Corona 19, Respiratory infection.

Introduction

The pandemic situation caused by the virus genetic material is SSRNA which affects the host and the entire respiratory system, causing severe illness and leads to death [¹]. In past years diseases like SARS and MERS [²] showed this pandemic effect, causing death affecting thousands of people compared to this novel corona virus is more pathetic and entire world is affected by this harmful pathogen. The most worrisome is that there is no proper drug and scientists are showing tremendous work in identifying the vaccine and to prevent the disease. World Health Organization (WHO) named this virus as nCOV and later renamed as COVID-19 [³]. International Committee on Taxonomy of Virus (ICTV) later identifying the structural morphology of the virus and is currently called by the name of SARS-CoV-2 [⁴].

The virus belong to coronaviridae family and possesses 4 different genera’s such as α, β, γ and Δ corona virus. The α and β viruses were present in bats and γ and Δ virus present in birds [⁵, ⁶]. The virus has genetic material of single standard RNA, which is about 32kb in length and largest human affecting RNA virus. The study focuses on the molecular techniques which can identify the nCoV more precisely. The aim of this technique is to gain knowledge among researchers in handling the molecular biotechnology as an essential medium.

Molecular techniques in COVID-19 testing:

Real-time RT-qPCR: Human corona virus (hCoVs) possesses minimum 10 open reading frames (ORFs) and the genetic material is similar to SARS-CoV-2. Out of 10 ORF, ORF1a/b has two large polyproteins with 16 proteins which are not in exact structure and forms the enzyme viral replicate transcripts in SARS-CoV as well as MERS-CoV [⁷]. The nucleic acid sequencing based techniques is advantageous over the other diagnostic investigations and are validated as confirmatory testing for COVID-19. The presence of viral SSRNA not only shows the presence of acute disease, since RNA traces decrease from 66.7% before day-7 to 45.5% during the days 15th to 39th days of infection [⁸]. The negative test in patients should be more careful and repeated sample
testing along with Chest imaging is very much helpful in tracking the records of severity of infection [9]. With certainty nucleic acid sequencing techniques is robust yet many difficulties remain such as damages that incur in SARS-CoV-2 target RNA during replicative processes and release of broken pieces of RNA into the bloodstream. These challenges can be overcome for isolation of RNA fragments using CRISPR or in combination with nano-based nucleic acid extraction.

COVID-19 testing by RT-qPCR is performed with labeled probes targeting either of ORF1 gene RNA dependent, N, E & S genes. USA developed an RT-qPCR diagnostic tool for identifying the corona viruses. For a patient to be confirmed positive, 3 reactions, dependent, N, E & S genes. USA developed an RT-qPCR diagnostic tool for identifying the corona viruses. For a patient to be confirmed positive, 3 reactions, focusing the N gene detect the virus and validated for the infection [10]. The Charite testing algorithm for SARS-CoV-2 infection states that test assays detect target genes to be positive in order to progress through the next step. The second step would consist of testing with RT-qPCR targeting the virus specific to RdRp with quality control of Alpha and Beta corona viruses, since other SARS-CoVs are not currently present in humans, the cases that are augmented and patients are true positives for the viral infection. Apart from these CT scan is highly recommended with false negative people. The possibility of false negatives by RT-qPCR tests with the patient’s nucleic acid shows high probability of false result in the early stage of COVID-19 infection patients[9].

The other persons viral RNA can be used as a positive control, the RdRp assay with two probes specific to the viruses and an additional probe that reacts only with novel CoV. By inhibiting the experiments, the probes react alone or in groups, show the same level of identification in each target virus. The assays were highly accurate with 95% detection probability and the copies per reaction have been identified. Similarly the N gene testing assay after ORF1b confirmation is a subgenus of Sarbeco virus [11]. The presence of viral pathogen in respiratory tracts was detected by amplification of the virus, nucleocapsid protein genes fragments for a total of 4880 cases revealed 39.80% positivity for virus nucleocapsid protein and ORF1ab (40.98%) [7]. The performance of QIAstat-Dx respiratory for the virus panel, which uses QIAstat-Dx cartridge permits direct insertion of the 66 NP specimens, was kept in transport medium without additional manipulation with testing activity comparable to that of the WHO suggestions. The RT-qPCR assay has a limitation of 1,000 copies/ml, and no cross-reaction other hCoVs (229E, OC43, NL63 and HKU), other respiratory viruses [13].

Future prospective of COVID-19 testing:

**LAMP Assays:** LAMP activity is based on the techniques of amplification of nucleic acid which is rapid and also amplifies target SARS-CoV-2 DNA with elevated specificity beneath isothermal conditions. Isothermal LAMP amplified a piece of ORF1ab gene; and synthesized a new RNA was equivalent to 10 copies of corona virus [14]. Random-amplification deep-sequencing of the novel CoV by mNGS platform helps in determining its origin, evolutionary history and discrimination among MERS-CoV and SARS-CoV identification. For the investigative purposes, the genetic material performs molecular assay for the human corona virus while some type of CoV deteriorates many primer sets. The respiratory panel consisted of multiple sets of oligo nucleotide detected endemic human corona virus whereas target virus was not detected in these panels. Eleven molecular devices from various manufacturers approved for testing of SARS-CoV-2 revealed variable performances. MGI Tech and Innovita utilized the NGS technique to detect all the species along with SARS-CoV-2 and an isothermal amplification technique coupled with chip detection respectively, while the remaining nine devices utilized real-time technique for amplification and detection [15].

**Film array for respiratory virus pathogens:** The ePlex RespiratoryPathogen Instrument is a comprehensive system requiring no additional accessories and has a testing capacity ranging from 24 to 96 samples tested within 2hrs thus providing flexibility of testing in small spaced laboratories. An added advantage of this system includes the generation of customized information and possible for the two directional interface with information system of the laboratory. In a multicentre study, USA and Canada, evaluating the ePlex panel (GenMark
Diagnostics) facilitated differentiation of four CoV genotypes with simultaneous detection of 19 different viruses. The ePlex offered a highly specific method of identification in microbial respiratory pathogens with 100% reproducibility and facilitates genotypes epidemic surveillance for better treatment strategies\(^{[16]}\).

**Nano-based diagnostic techniques:** The implication of nano materials with potential application into diagnostic tests is a critical tool for rapid screening of cases at-risk populations. A one-step reverse transcription with nanoparticles-based physiochemical detector, i.e. biosensor designed using 2 LAMP primer sets, F1ab and nasal pharynx genes of the virus concurrently identified both targets with sensitivity of 12 number of copies and there is no cross reaction generated from the viral templates\(^{[17]}\). Seo et al developed virus with a particular protein in spike which is coated with the sheets of graphene sheets possessing a detector for the novel virus in clinical samples\(^{[18]}\). The 2D-gold nanochip-based plasmonic nucleic acid biosensor developed by Qui et al facilitated the detection of viral RNA up to 0.22ppm concentration using localized Surface Plasmon Resonance. A micro fluidic ELISA developed by Tan et al reported of quantitative, sensitive detection of the virus specific antibody and antigen in serum within a short period of 15-20 minutes\(^{[17]}\).

**Conclusion**

Health care workers are involved in tremendous efforts in global crisis to stop the spread of COVID-19 with their therapeutic plan as per the guidelines of WHO. Scientists were actively involved in treating the virus and developing new vaccines and therapies. Deeper knowledge and clinical tests are conducted all over the globe and countries join hands to prevent the spread and vaccinations are in trial till date. Thus, our study focuses on the molecular diagnostic tools to identify the virus more accurately to avoid false positive or negative cases to inhibit the pathogenic spread.

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**References**


Topical Applications of Antioxidants for a Topic Dermatitis

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Abstract

Atopic dermatitis is a skin disease which majorly affects the children. It can be caused by dust, mites, pets and food allergens. Atopic dermatitis is induced by the allergens and ends up in the elevated level of Immunoglobulin G. People from the developing countries such as New Zealand and U.S are more prone to atopic dermatitis skin disease because of the low level of melanin production in their skin. This can be reduced by the use of natural compounds such as glutathione derived from plants. In this article, the functioning and active molecules of glutathione for atopic dermatitis are discussed.

Keywords: Skin disease, Atopic dermatitis, glutathione, IgG, melanin.

Introduction

Microorganisms play an important role in curing the skin infections like eczema which are caused by the microbes like bacteria, fungus and viruses. Patient with atopic dermatitis is infected with the pathogen Staphylococcus aureus and these kinds of bacteria does not require antibiotic for the treatment. Antibiotics are used for the lesions and oozing leakages in the skin for the patients. Antimicrobial peptide production deficiency in the skin of atopic dermatitis can lead to have a greater risk of getting viral infections such as pox viruses caused by Molluscum contagiosum produced round shaped blisters, pimples on the skin. Typical super infection on the skin is caused by another important virus called herpes virus. Herpes simplex virus causes infection spreads all over the face and in the chest region leads to vesicular eruption. Eczemic conditions in patients are recommended for antiviral treatment [1].

Glutathione: Glutathione consists of thiol, compound having a multifunctional role in plants. Function of glutathione is recognized earlier, is based on the thiol-disulphide interaction with other compounds. It works by how glutathione is reduction and oxidation manner to give a disulphide form that is then recovered by the NADPH-dependent glutathione reductase enzyme to form glutathione. Role of glutathione in animals is established as a defensive mechanism in animals that is because of the enzyme, selenium dependent glutathione peroxidase production which works as a central pillar of animal metabolism. Glutathione works as antioxidant in animals [2].

The analysis of GSH(Glutathione) is gaining great interest in the field of science, many method have been proposed for the production of glutathione. The experiment on liquid chromatography and enzymatic determination are most processed experiments. Capillary electrophoresis is also one of the best method to obtain glutathione, which is simple, fast and reproducible method to obtain and analyze the compound with low cost effective procedure [3].

Superoxide Dismutase: Atopic dermatitis are formed by the association of oxidative stress and others intruders in the development of skin peptides and proteins. This superoxide dismutase is worth in reduction...
of oxidative stress in the development of Atopic dermatitis in children. This is possible through the use of topical antioxidants, such as SOD. It is referred as the primary antioxidant and also as a ubiquitous enzyme, knowns to be the defensive agent anti-oxidant [4]. This enzyme shows catalytic activity induces the reaction in a fast manner helps in renewing the process. Mechanism of action is not common with other active compounds such as vitamin E, glutathione, and carotenoids they are compounds which are believed to be easy exhaustible without the possible renew abilities. This enzyme is capable of converting an enzyme superoxide anion to hydrogen peroxide by distracting the reaction of O$_2$. Hence the ROS production and free radicals are converted by this superoxide dismutase enzyme. A very harmful reactive nitrogen species are also protected by the enzyme superoxide dismutase [4].

**Vitamin C**: It is considered as one of the water soluble in all the Vitamins. Lipophilic are antioxidant A and E. Vitamin E is considered as the bond breaking antioxidants, which helps preventing the skin from oxidative effects and unsaturated lipids present on the membrane of the cell. For skin regeneration, Vitamin C is mostly preferred. It plays an important role in neutralizing free radicals by giving hydrogen ions to free radicals, then the vitamin C changes as ascorbate after the donation process. Vitamin C not only prevents the skin from free radicals induces oxidative stress it also works as Co-factor of glutathione and Vitamin E in the causative agents of stress in the production of proteins for skin protection. One of the most effective scavengers is beta-carotene works well against the alkoxyl and peroxide free radicals [4].

**Vitamin E**: Atopic Dermatitis patients are treated with vitamin E orally and given as transdermal. The random clinical trial has suggested to use vitamin E for the topical application of this skin infection after observing the inflammatory responses. To incorporate such micronutrients nanotechnology approaches are made to make the compounds bioavailable water soluble vitamins. Nano formulations with vitamin E have been utilized for the efficient delivery of skin retention nanotechnological approaches towards this issue are more advantageous. [5]

**Astaxanthin**: These studies are conducted in mice for the antioxidant activity using Astaxanthin, 3,3′-dihydroxy-β-carotene-4,4′-Dione, carotenoid obtained from an algal compound without the Vitamin A. Astaxanthin work efficiently than the β-carotene and α-tocopherol. It has many therapeutic agents and activity such as anti-cancer, anti-tumor and antiviral activity. ROS activity is controlled by astaxanthin and oviduct epithelial cells in bovine also the n-oxidative stress. Additionally, Astaxanthin inhibits the inflammatory mediator production by controlling the signaling pathway of nuclear factor-kB. It prevents the skin from ultraviolet (UV) induced photokeratitis in the topical administration of mice by decreasing the oxidative stress in the eye cornea region [6]. An antioxidant, which inhibits the inflammatory response are Vitamin A, C and E. Antioxidants that are produced during the maternity period are intended to have protection against the child prone to atopic dermatitis leads to asthma [7].

**Melatonin**: Melatons are well known for immunostimulation in allergic reactions. It is also known for its antioxidant and cryoprotective effect in the cell affected by inflammatory actions. Inflammatory diseases lead to the decrease in melatonin secretion and free radical production that worsen and increases the skin infection. The release of Pro-inflammatory mediators and vaso active agents and infiltration of mast cells leads to the skin disorders such as atopic dermatitis. The immunoglobulin E and interleukin-4 in the serum are increased during the atopic condition when the melatonin production is inhibited in the skin. Allergens in the bronchial region indicate the presence of Immunoglobulin E leads to asthma by the inhalation of allergens. It regulates the immune response and shows the smoothness in muscle. This anti-oxidant however, increase the activity of pro-inflammation in asthma tends to bronchial inconvenience. It also works as a sleep inducing agent in asthma patients, but not recommended for intake in regular basis [8]

**Solanum tuberosum L.**: Solanum tuberosum extracts inhibit the lesion formation in atopic dermatitis patients from the study carried out in NC/NGA mice. Skin irritation, itching ear bulging and scratching habits was inhibited by the use of extracts from Solanum plant role is to inhibit the inflammatory responsive cells reaction. Solanum tuberosum treated mice showed reaction against the Ig E serum level [9].

Mast cells and activation of helper cells are found in the patients with atopic dermatitis. It is found to be associated with an increase in Th2 cytokine serum, including interleukin-4, interleukin-5, interleukin-10, and interleukin-13 productions are noticed in patients
with this skin infection. The expression level of interferons is also reported in patients with atopic dermatitis. Antioxidants play a major role in inhibiting the cells with a skin infection and protect the skin from UV-rays. β-hexosaminidase is also recommended in research incorporated to the mice to check the reaction against atopic dermatitis [10].

**Furfuryl Palmitite:** It is an ester based compound obtained when palmitic acid reacts with furfuryl it has remarkable oxygen quenching property. This antioxidant is low reactive in nature, consisting of no ionic charge, which helps in spreading through the dermis layer beneath the skin and damages the cytoplasmic and nuclear composition. These are one of the primary reasons in skin aging and other dermatitis issues and it protects the skin in spreading infection [11].

**Natural Antioxidants:** A Phenolic compound plays a major role in photoaging derived from natural compounds present in plants. It is identified in flavonoids. Flavones, isoflavones, cinnamon compounds these are derived from berries which are rich in antioxidants. These entire compounds play a major role in protecting the skin from oxidative stress, inflammatory response, UV-damage to the cells. All these compounds and skin care regimes play a defensive mechanism in protecting the skin from those damages [12].

**Ethanolic Extract of Juglans regia:** *Juglans regia* plant showed very good scavenging activity and confirmed by the DDPH scavenging assay. These plants will protect the skin from damages [13]. The impact of ROS in biological systems is that the level of body fluids, DNA and lipids are measured by the biomarkers helps in the identification of diseases. DNA oxidative damage and repair are identified by the biomarker Urinary 8-hydroxydeoxyguanosine (8-OHdG). Some of the antioxidants are derived from protein with advanced antioxidant property and glycation products [14].

**Ferulic acid:** The major phenolic compound present in the plants works against the skin infection are ([E]-3-[4-hydroxy-3-methoxy-phenyl] prop-2-enolic acid) in the plant tissues. Biological properties and phenolic compounds protect the skin from atopic dermatitis. Glycosides, tannins, flavones and tannins are present in plants which safe guards the health of human in many ways. Benzoic acid and cinnamic acids are the major phenolic compounds which are responsible for the reduction of free radicals and oxidative stress in the skin [15].

**Conclusion**

Skin infections are higher in children due to many reasons such as close contact; unhygienic approaches such as hand wash and healthy food intake are the major problem in children. Atopic dermatitis is caused by the bacterium and develops as a major intolerable skin infection. This can be controlled by the antioxidants which will reduce the oxidative stress and UV-rays caused damages to the skin. Many antioxidants, phenolic compounds play a greater role in controlling the skin related disorders. The daily intake of these natural compounds and topical administration to the skin prevents from major skin diseases.

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**References**

Hypertension: A Review

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Abstract
Throughout the world, as per research about 1.13 billion people are affected by hypertension. The increase in blood pressure which is unable to be handled at a given situation is known as hypertension. People from middle and low income countries are affected due to the hypertension. This is due to the high expectation in living style, job dissatisfaction, and comparison between persons. This phenomenon is becoming a burden throughout the world and it is affecting the younger generation. This leads to decrease in life expectancy and it is a leading cause of deaths around the world. This paper analyses the various reasons for the hypertension and its causes and the obtained results are summarized.

Keywords: Hypertension, risk factor, determinants, occupational stress, DALYs

Introduction
Elevated blood pressure in medical terms is known as Hypertension. It is a serious condition in which the end organ damage is very obvious. Around the world about 1 in 4 among men and 1 in 5 in women affected by hypertension which amounts to about 1.13 billion. Many of those affected are from middle and low income countries. The prevalence of hypertension in India is found to be about 30.7%, according to a study conducted in India. The men in India are found to be more prone to developing the disease when compared to men.[2] In Tamil Nadu the prevalence was reported to be 21.4% and the prevalence was same in both the genders.[3] In a Meta analysis published shows the hypertension to be 27.6% in rural areas of India.[4] It is also leading cause of mortality and global disability-adjusted life years (DALYs). In 2015 it was observed those 10.7 million deaths and 20.9% of all DALYS. It was also estimated that the killer disease is becoming more prevalent in children and adolescents. The prevalence is more in low and middle income countries than those in high income countries and it is the same in European countries.[5] It was also estimated that a reduction in the prevalence of hypertension by 17%, which was attributed to reduction in salt intake would prevent 24.3 thousand deaths by the year 2030. It was also suggested that by reducing the deaths by hypertension can reduce the additional cost of hypertension by 6 to 8 folds.[6] Thus, hypertension is a major disease and a leading cause of DALY and deaths around the world.

Though there are many studies on hypertension, there is not much study done in rural population and in our country. This article is a review work done on hypertension, especially in the rural population of our country. Hence this study will provide an insight into the hypertension status in our country and especially in rural population.
**Material and Method**

Data were taken from Google Scholar and Pubmed by using terms such as hypertension, rural, risk factors from January 2000 to September 2020. Articles which were available as full text and in the English language were selected. All articles related including cross sectional, descriptive, cohort, randomized, non randomized, qualitative and systematic studies were taken. About 30 articles were in total. Based on non availability of full text articles 19 were excluded. So finally 11 were included.

**Result**

**Socio demographic determinants:** In a study conducted among tribal population the prevalence of hypertension was found to be different in different states. It was found to be higher in Orissa (55%) and lowest in Gujarat with prevalence to be around 11%. Among those diagnosed as hypertensives more than half were taking treatment for the condition. According to the same study, elderly people were more at risk of developing hypertension when compared to the younger population. Abdominal and also general obesity were found to be a major risk factor. Age, literacy obesity and physical activity were found to be statistically significant. [7]

In a study conducted among tribal population the prevalence of hypertension was observed to be 27.1% among men and 26.4% among the women. Of those who were found to be hypertensive’s only 10% were previously diagnosed rest were only newly diagnosed rest all were known hypertensive sans more than half (55-68%) were taking. In a study conducted among the rural population, it was found that the prevalence increased with age advancement. Hypertension was found to be more prevalent in people of higher socioeconomic strata. It was also reported that a higher socioeconomic group about 15%-35% of the people were having obesity. About 69% of the men and women have reported low vegetable intake. And about 33% men had dyslipidemia in higher socioeconomic groups. Where else in the lower socioeconomic group only about 13% of them were having obesity. And risk factors for developing any non communicable disease was found to be more in south Indians when compared to North Indians. It was reported that dyslipidemia was seen in 21% of the North Indians when compared to South Indians where the percentage was 33%. It was also reported that only 13% of the North Indian women had obesity where else 24% of the South Indian women were suffering from obesity. [8]

In one another cross sectional study conducted the prevalence of hypertension was found to be 7.24%. It was reported as age advances the prevalence also increases. Like it was 0.41% among 19-28 years whereas, it was 31% among subjects of around 79 years. Age was also statistically significant with hypertension. Among the genders, women 55.2% had hypertension, but in men it was only 44.6% and gender was not statistically significant. About 5.58% who had hypertension had a normal Body Mass Index. But those with increased BMI had higher prevalence of hypertension. It was found that about 5.31% were reported to take extra salt and among those, more than half were found to be hypertensives. [9]

In a study, conducted among rural population the prevalence of hypertension was found to be 14%. The prevalence was more in age group above 35 years. It was also observed that income had no effect on the disease development. It was also reported that 72% of the people who were having hypertension. The different education levels showed a difference in hypertension. About 20.7% of the subjects who had increased level of cholesterol had hypertension. It was also found that cholesterol levels and development of hypertension was found to be statistically significant. [10]

**Psychosocial determinants:** In a study conducted among tribal population the alcohol consumption was associated with disease development. The alcohol and tobacco habits were all statistically significant with the disease development. [7]

In a review article it was reported that 40% of the men and about 4% of the women had the habit of consuming tobacco. It was observed that people in the lower socioeconomic group had been using tobacco more when compared to those in higher socioeconomic group. [8]

In a study conducted among rural population the tobacco intake showed no significance. The alcohol intake had a significant risk of developing the disease. [9] In a review study conducted it was found that occupational stress was linked with hypertension. The various studies taken for explained the relationship between work stress and hypertension. It was also observed that immigrant population had varying hypertension state when compared to the general population. It was concluded that acculturation had an effect on disease development. [11]
**Public health considerations:** Most people due to changes in lifestyle are prone to non communicable diseases such as Hypertension. Though it is a well known disease, but still takes light from the people around the world, especially in developing countries like India that too people in rural population are very highly affected.

Government of India has already brought in programs for screening, treatment and management of complications. But not that it has reached the rural population in many areas of the country. So the general public should be made aware of the risk factors, signs and symptoms, the complications and about the dangers of not taking proper treatment. They should also be made aware that hypertension is curable when diagnosed early we can avoid any further complications.

**Conclusion**

The major risk factors identified were age, socioeconomic status and habits such as alcohol consumption and smoking. It was also identified that hypertension is more among the rural population and also among migrants as these are the areas where the health care becomes difficult to reach due to environmental factors and various other determinants.

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**References**


Endangerment of Pharmaceutical Waste Disposal in the Environment

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Abstract

Disposal of pharmaceutical wastes in the environment leads to many losses and causes damage to the ecosystem. Plants, animals and human beings are put in endangerment due to the medicines and injections disposed in the environment. Toxic chemicals and substances exposed to the public nearby places causes many diseases such as respiratory syndromes and cancers skin infections and genetic disorders. Disposal in marine area pollutes the living atmosphere of aquatic organisms affects the ecosystem in unexpected ways. Considering this, environmental department should take effective precautions to protect and ensure the safety and peaceful living of beings in the environment. In this the article pollutants, toxic chemicals scavenged in the environment by the pharmaceutical industry, which has many adverse effects to the safety and a clean environment are discussed.

Keywords: Pharmaceutical waste, chemical industry, environment, pollution, pollutants.

Introduction

Pharmaceutical wastes are disposed in many forms such as the remained stocks of drugs, used needles, cottons with impurities and the surgical wastes, the expired medical kits and the cytotoxic wastes. All the wastes are considered as toxic to the ecosystem devastating materials. People are unaware of these consequences caused by the wastes from hospitals. Public concern level and voice against the illiterate activities done by pharmaceutical industries also leads to the impure ecosystem. Biggest worrying the bird vultures are affected by the diclofenac medicine, it is used in the treatment of inflammation in the veterinary hospitals. Antibiotic disposal in the environment, bacterial mutations are occurring and contamination strains are becoming resistant to such medicines which are of no use. In Waste water management the livestock feed is mixed with the disposal from pharmaceutical industries that disrupts the lives of the aquatic organisms. Ciprofloxacin, Oxytetracycline, sulfamethoxazole these are the major antibacterial drugs found to be resistant to many bacterial strains present in the pools and ponds of fresh water. Denitrifying and degradation of organic matter are affected the sewage wastes left in the environment. Such exposure to medicines and drugs led to the environment and mutation occurs in the soil born bacteria may cause adverse effects. On the whole high level of precaution must be taken before letting the exhausting materials from hospitals, laboratories and pharmaceutical industries which affects our ecosystem[1].

Biomedical Wastes: Biological waste materials can be a liquid or a solid form disposed from the industries,
hospitals from the treated patients. WHO says the toxic chemicals estimates that only ten percent of the disposals are infectious and 50% are non-infectious and remaining are non-toxic but consists the hazardous materials like methyl chloride and major concern is the toxic chemical transmits the virus and deadly bacteria from the wastes and not managed properly and just disposed as such in the environment. It seriously affects the living of slum people and people living around the rivers and roadside can lead to high range of environmental pollution [2].

Water Pollution: Risks are categorized into three types such as genotoxicity, carcinogenicity and toxicity create negative impact on the society in terms of environment disposal and wastages from industries and develops resistance in the microorganisms. Toxic chemicals inhaled by the organism show different mode of transmission from their natural behavior may be resistance and a species endangerment can happen. Maternal wastes such as hormonal tablets and drugs are toxic when it is exposed in the public environment. Some of the research, conducting institutes and industries letting the hazardous chemicals in the sewage that causes mutation in the organisms developed from the sewage wastes. These phenomena may accelerate the pathogens becoming resistant to the powerful drugs. This issue may cause changes in aquatic living organisms, some of the fish species are dead after the uptake of disposed drugs which also affects their fertility process [3].

Soil Pollution: Mesophilic are the group of organisms living in moderate temperature is involved in the treatment of soil in recent times, which are indirectly affected by the pharmaceutical wastes. Sinking matters, microorganisms which enhance the fertility of the soil and organic matters are demolished when met with pharmaceutical wastes [4]. Major concern is active ingredients present in the environment which doesn’t support the environmental safety. Some of the cost effective mechanisms are developed to find and determine the trace level of contaminants produced by the pharmaceutical wastes which affects the quality of life. The cooling water system and the floor, wash system have been introduced and it is established to control the soil by the pharmaceutical wastes [5].

Aquatic Pollution: The pharmaceutical wastes are dumped in the sea and thrown without the care about the ecosystem and the organisms present in the sea. Discharged particles mixed in the seawater directly affect the organisms; especially it creates abiotic stress in the sea. The major accumulation of toxic chemical affects the tissues of the fish. Some of the parameters include pH, sunlight, temperature should be taken into concern. The level of toxic chemical affecting the atmosphere should be eliminated and discarded from the sea to maintain the temperature level. The particles which are hard to eliminate from the sea affects the ecosystem which should be properly eliminated to safeguard the earth to protect it from natural disasters formed in recent years [6].

Hazardous Wastes: Amoxicillin possesses antibacterial activity and it is present with beta-lactam ring this molecule is known to be cleavable. There are majorly two metabolites present in the compound especially amoxicilloic acid, amoxicillin diketopiperazine-2,5- dine as DIKETO. It has high allergens with high risk when it is disposed in the environment. Several method to determine the presence of this antibiotic is found. This low amount of antibiotic is found in soil, water and in the environment. Liquid chromatography is the technical method and powerful tool to determine the traces of amoxicillin present in the environment. This is the major pollutant and pharmaceutical wastes put into the environment [7].

Chemotherapy Waste: Bulk chemotherapy wastes are let into the environment which is considered as the most hazardous materials. P- and U hazardous materials which are low in limit to detect and destroy. The mostly preferred method is incineration the use of heat to destroy the materials that are toxic and when it’s incorporated into the ecosystem it creates the unimaginable adverse effects due to the biological materials such as used syringes, infected gloves, tubing surgical gloves and aprons used for surgeries and treatment. The routine method of cleaning, preparation and administration of drugs should be taken care properly in the absence of such cleanliness leads to toxic effects in the normal people. There are safeties level should be properly followed by the industries and hospitals [8].

Genotoxic Waste: The carcinogenicity is mostly referred as genotoxic and also referred as mutagens cause’s effects in bacterial strain, aqua livings and also in human. These sorts of materials should be disposed with utmost care and the huge distracting waste material in soil in a cancer hospital and research institutes dealing with cancer. Drugs such as doxorubicin, phenacetin, lomustine and cyclosporin are carcinogenic and get easily accumulated in the soil without proper waste disposal [9].
With the help of contractors and public health volunteers involved in the disposal management, the wastes are disposed. There are certain laws, rules and regulations are maintained in the health department to maintain the safety of the public. While disposing and discarding the drugs in the soil or the clearance of drugs needs specialized companies who have taken care in disposing the waste has to report to the government. They also have special equipments and instruments to clear the waste from industries [10].

Rules and regulations divided into six categories in India. The major categories are BMW (Biomedical waste). All the wastes from hospitals are established and the leap of wastes are generated were discarded on a daily basis. Mostly it was incinerated and deeply buried in the soil and to discard those debris hospitals should get approval regarding this from the corresponding authority. They need to have extra care while disposing the outdated products and expired medicines and drugs because they can interact with bio molecules present in the soil [11].

Determinable effects are created after disposing the hormones, antibiotics and tablets to the environment. By flushing out the substances in ground water, river and in sewage water can create drastic changes in the microorganisms living in all the places. Even though people are careful while living near the slums the waste disposal indirectly affects the health of people by air, drinking water and in the soil. Instead, it directly affects the land, the wastes should be properly packed and disposed to prevent the birds, and animals surrounded in the ecosystem will be protected [12].

HPLC (High performance liquid chromatography) has been found as one of the important qualitative and quantitative measure of drug used worldwide. HPLC is preferred in most pharmaceutical companies for the analytical technique. This technique is used for validation, formulation, production and to ensure the quality of drug these are pre steps taken before releasing the drug to the market. These analytical method can take even few hours or many days to validate the process of drug development [13].

**Bio-active compounds in the pharmaceutical wastes:** Paddy is the most stable grains available for the global population. Paddy waste such as dusk and straw are let simply into the environment considering the no use of it. Annually, the straw and husk from the paddies are taken for the pharmacological potential as it can save the soil fertility and soil quality [14].

Polysaccharides namely hemicellulose that are mainly differing from the several cellulose materials branched and have chain smaller in length. The unique nature of this material has attracted many industries, especially pharmaceutical industries. It is polymerized and used as disposable agents and identified in many natural plants which have highest composition of cellulosic material. Methylcellulose is considered as one of the other beneficial compounds dissolved in the alkaline solution and used further [15].

The hospitals conduct the pharmaceutical waste disposal program called Disposal of used medicine program. This program is conducted to deliver the ideas of disposal and ways involved in the disposal of the expired medicines and products from the hospitals [16].

**Conclusion**

Toxic chemicals and drugs causing severe effects and creates impact on the society by the pharmaceutical industries. People are affected by the poisonous material let by the industries in the environment. The ecosystem is altered with the consequences faced by the organisms living in soil, air and water. The government and public health department volunteers should involve in such matters to insist people about the drastic effects caused by the pharmaceutical wastes. Safety measures and risk assessment should be done before the disposal of drugs, medicines and products before disposal to ensure the safety of the ecosystem.

**Ethical Clearance:** Nil

**Source of Funding:** Meenakshi Academy of Higher Education and Research, Chennai, India

**Conflict of Interest:** Nil

**References**


Phycoremediation of Heavy Metal Removal from Pharmaceutical Industrial Effluents, Kandigai, Kanchipuram District, Tamil Nadu

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Abstract

Water pollution occurs due to excessive releases of toxic heavy metals in urban wastewater is increasing the threat to aquatic ecosystems. Treatment of waste water with the algae is termed as Phycoremediation which is a unique, cheap, method to treat the polluted water by a method of natural selection. Therefore, in the present study effluents with an algal species were taken for Phycoremediation using five different concentrations were used for treating pharmaceutical industrial effluents. Our research focused on microalgae Chlorella sp. and Scenedesmus sp. were used to treat the effluent at different concentrations depending upon the tolerance in severe conditions. In addition to this treatment algal consortium was also treated in the same way. These two algal species were taken based on its predominant growth in the effluents collected. The physico-chemical parameters of all treated effluents were recorded in different time intervals, from 1st week to 3rd week respectively. Chlorella and Scenedesmus sp. reduces drastically heavy metals like sulfate, lead, nickel, copper and zinc. According to the present investigation, the highest Phycoremediation was achieved in sulfate, zinc and copper. The results revealed that the above mentioned both algal species were also highly efficient in reducing BOD, COD, TSS and TDS. In addition to this the biochemical and bio pigment analyses were done for these two micro algal species. Therefore, this preliminary study indicates that the use of two microalgal sp. could be used as they are eco-friendly adsorbents in treatment of polluted wastewater.

Keywords: Consortia, Chlorella sp., Phycoremediation, Scenedesmus sp.

Introduction

Heavy metals are exposed chemicals present in waste water, which has higher density than water. Depending upon heaviness, the toxicity caused by these heavy metals is of serious health concern. The metalloids like lead, arsenic zinc when present in least amount doesn’t produce toxicity, but when formulating industries releases tones of heavy metals the ground water gets totally disturbed and the outcome of this is diseases due to contamination. Thus, public health and ecological disturbances affects the population and the environment by these toxic heavy metals.

The major concern causing heavy metal contamination is due to the increased population which acts as a cycle so more demands rises and more people are employed in industrial, domestic and commercial sectors. The toxicity produced by these sectors when directly released into the nearby ponds and pools the health hazard is a common criterion in these exposed areas. The industries which produce heavy toxic metals are mining industry, smelting industry or any metal manufacturing industries, though the metals are required in the body to some extent but larger proportions leads to severe illness. Wastewater with these heavy metals is a serious threat to the environment because of the presence of poisonous nature [6-9]. The heavy metals released from the pharmaceutical industry contain mutagenic and carcinogenic agents [4].

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To overcome this issue a new technology of Bioremediation was in practice to transform harmful organisms by inhibiting its growth and making the effluent to be good to deliver in the ponds or estuaries. This alga based technology treats the wastewater and absorbs the heavy metals and make the water fit for drinking. Hence this treatment plan was economically feasible and eco-friendly in nature [13]. The nutrient rich wastewater reduces pollutants and helps to maintain the external conditions [7,11].

Thus, our research focus on treating the heavy metal contaminated pharmaceutical waste water using microalgae is more efficiently uses the heavy metals to take up the nutrients and produces a valuable biomass to produce other byproducts [10-12](Park, 2011; Venkata Mohan, 2011, 2015, 2016a). The phycoremediation is very cheap and low growth period to remove heavy toxic metals and possess other applications.

Materials and Method

Sample collection: The wastewater sample was collected from the Pharmaceutical Industry, Kandigai, Kanchipuram district, Tamil Nadu. Algal deposits were collected from the sites and physiochemical parameters were recorded using an YSI Multi parameter.

Identification of algae: The collected algal samples were observed in the microscope and based on the structural morphology and by the expert handling the algae was identified. The selected 2 algal strains were *Chlorella* sp. and *Scenedesmus* sp. These two algae were collected by serial dilution method and spread plate method. The purified culture was grown in Bold Basal Medium and culture was maintained for 21 days to obtain the growth curve.

Analysis of Growth curve: The growth rate of the experiment was kept in optimal conditions of 12:12 (Light: Dark) at a temperature of 28°C. The periodic monitoring of the sample was measured and shows a peak at 680nm. Three samples (*Chlorella* sp., *Scenedesmus* sp. and consortium) were frequently checked to establish a growth curve for a period of 21 days for 5 different concentration and control samples.

Physiochemical and Biochemical tests: The physiochemical parameter is checked for both untreated and treated effluent by using microalgae was estimated (APHA, AWWA, and WEF. 1998). The pigments such as Chlorophyll a, b and â-carotene were estimated by the following method; [5] Jeffrey and Humphrey method, 1975 and [8] MacKinney method, 1941 respectively using different wavelengths by a UV visible spectrophotometer (Hitachi U-2900). Bio-Chemical analysis, such as Carbohydrate (Dubois et al. method 1956) [2], Protein [1] and Lipid [3] were also determined. The absorption of metals by algae was studied using Scanning Electron Microscopy (Golab, 1992).

Results

Physiochemical parameters: The various physico-chemical parameters measured were pH, water temperature, dissolved oxygen, BOD and COD. The water temperature in pharmaceutical industry ranges from 28.0 to 32.0°C. The pH of sampling site ranged between 5.8- 6.7. The value of the dissolved oxygen content of water is 4.1 to 9.52 mg/L. Pharmaceutical industry waste water sample shows COD (1240mg/L) and BOD was observed as (374 mg/L) in the sampling site. Based on the quick adaptation and the high growth rate the microalgae strains were selected. The growth rate was calculated using spectrophotometric readings for 21 days.

Biochemical parameters: The *Chlorella* sp., *Scenedesmus* sp. and consortium showed the extracted sample was subjected to biomass productivity till 21 days of incubation. The estimation of protein content was high in *Scenedesmus* sp. (45.10%) consortium (39%) and least in *Chlorella* sp. (18.65%). The carbohydrate and lipid show a high amount in a consortium of 17.12 μg/ml-1 and 40.49% and both *Chlorella* and *Scenedesmus* sp., shows a similar range of 15.07 and 15.67 μg/ml-1 and 38.10% and 18.89%.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Protein (% dwt)</th>
<th>Carbohydrate (% dwt)</th>
<th>Lipid (% dwt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorella Sp.</td>
<td>18.65</td>
<td>15.07</td>
<td>38.1</td>
</tr>
<tr>
<td>Scenedesmus Sp.</td>
<td>45.1</td>
<td>15.67</td>
<td>18.89</td>
</tr>
<tr>
<td>Consortium</td>
<td>39</td>
<td>17.12</td>
<td>40.49</td>
</tr>
</tbody>
</table>

Table 1: Biochemical Composition of Selected micro algal species
Pigment Analysis: The chlorophyll and carotenoid pigments were tested for efficacy of selected microalgal strains of which consortium 18.12 µg ml⁻¹ and 192.15 mg ml⁻¹ showed high range compared with the individual species of Chlorella sp. and Scenedesmus sp 15.343 µg ml⁻¹, 185.23 mg ml⁻¹ and 11.16 µg ml⁻¹ and 145.8 mg ml⁻¹.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Chlorophyll a (µg ml⁻¹)</th>
<th>Chlorophyll b (µg ml⁻¹)</th>
<th>β-carotene (mg ml⁻¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorella sp.</td>
<td>15.343</td>
<td>25.134</td>
<td>185.23</td>
</tr>
<tr>
<td>Scenedesmus sp.</td>
<td>11.76</td>
<td>16.13</td>
<td>145.8</td>
</tr>
<tr>
<td>Consortium</td>
<td>18.12</td>
<td>23.31</td>
<td>192.15</td>
</tr>
</tbody>
</table>

Graph 1: Biochemical parameters of microalgal strains

Graph 2: Pigment analysis of selected microalgal strain.
Conclusion

The industries and pharmaceutical manufacturing companies should abide by the rules of FDA to maintain the quality of waste water and these industries should discharge and reuse without releasing the toxicity. Phycoremediation technique is a promising source to treat the waste water without causing any health hazards and also making the environment green and clean. The selected algal strains help in reducing the toxicity and facilitate 3R’s. The use of wastewaters for cultivating microalgae is necessary in order to reduce the cost of microalgae production. Furthermore, countries like India with abundant sunshine are suited well for Phycoremediation as a method of green technology.

Ethical Clearance: Nil

Source of Funding: Meenakshi Academy of Higher Education and Research, Chennai, India

Conflict of Interest: Nil

References

Studies on Invitro Analysis of Sargassum Wightii Against Human Simplex Virus (HSV)

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Abstract

Introduction: Human simplex viruses are ulcerative diseased found in skin and genital organs depending upon the strain. It affects an individual at least once in a lifetime by direct contact with an infected person. There are two strains of HSV predominantly found are HSV-1 and HSV-2. HSV-1 infects the pharynx and oral region, whereas HSV-2 infects the genital areas of sexual contact.

Materials and Method: The crude extract of *S. wightii* on the proliferation of Vero cells was assessed by the neutral dye uptake method. Various fold of serially diluted solvent crude extracts showed cytotoxic concentration 50 (CC 50) at 750 and 500 μg/mL of ethyl acetate and methanol extract, respectively.

Results: The Antiviral activity of solvent crude extract against HSV-1 showed significant reduction of virus on Vero cells. Among the solvent crude tested, the ethyl acetate showed effective IC 50 against HSV-1 at 300 μg/mL.

Conclusion: The seaweed *S. wightii* is a natural source in treating the pathogen HSV-1 and it clearly indicated that, the marine brown algae *S. wightii* possess strong antiviral activity with slight cytotoxic effect.

Keywords: Sargassum wightii, HSV-1, Antiviral activity, Octyl butyl phthalate, Neutral dye.

Introduction

Marine resources are abundant and most of them are not explored due to its vast environmental conditions and growth patterns. A country like India is diversified with a long coastline of about 7500 km with high amount of seaweed population [1]. The habitat of macroalgae in the marine environment is present along the coastline, embedded with rocks having high nutrients, immersed in the sea water at great depths. Depending upon the nature's pattern seaweed produces numerous active compounds [11] which are very much useful for the mankind. The active ingredients obtained from the seaweed helps the society to have a healthy life against harmful pathogens and enrich the field of Pharmacology in producing new drugs [2].

Herpes simplex virus (HSV) is a communicable virus which transmits from person to person. Our studies focus on HSV-1 which affects the oral and pharyngeal regions of the population. It affects almost all the people irrespective of any age from neonatal to old age people. The structure of HSV-1 consists of ds DNA, Capsid, Capsomeres and tegument and type 1 belongs to α-HSV. Viruses are manifested in epithelial cells and then spreads to the sensory nerves and finally produces cutaneous lesions [3]. The symptoms with HSV-1 patients are mouth sores, tingling, itching and oral sex. Patients with HIV, Cancer, AIDS, transplantation performed, patients, when infected with HSV it may cause serious effect such as inflammation in the brain, eye infection, and even deaths can happen [4].
1 is easily prevented by avoiding direct contact with infected persons, sharing their utensils; avoid kissing or oral sex and frequent hand wash. In newborn infants of about 10,000 births, 10 babies are infected with HSV-1 as per the WHO report. This infection in babies causes nerve problem and even death when passed from mother to fetus\[5\].

The seaweed Sargassum wightii belongs to a Pheophyceae family\[6,12\] and abundantly found in warm and temperate climate\[7\]. In India, it is distributed in Maharashtra, Goa, Kerala and Tamil Nadu. In Tamil Nadu, it is found along the coastline of Kovalam, Rameswaram, Mandabam areas. The macroalgae S.wightii is rich in alginic acid, which is a commercial product. The macroalgae is rich in secondary metabolites and these are helpful in synthesizing pharmaceutical products (Subash et al., 2014). Thus the present work aimed at treating the HSV-1 strain with the macroalgae as a biological method and it is cost effective in nature.

Material and Method

Study area and Extraction process: The seaweeds were collected from Coastal line of Mandapam, Ramanathapuram District, Tamil Nadu, India and was identified as Sargassum wightii by the phycologist expertal committee and sample were washed in tap water followed by distilled water and shade dried at room temperature. The dried sample was powdered using mechanical blender and extracted using mid polar to polar solvents i.e. Ethyl acetate and methanol. The sample was filtered and condensed using rotary evaporator and stored till further use \[8\].

Cells and viruses: Vero E6 cells were cultured and maintained in Eagles Minimum Essential Medium (EMEM) with 10% fetal calf serum (heat inactivated) and antibiotics like penicillin and streptomycin 100 µg/ml kept in incubator at 37°C with optimal conditions like CO₂ and humidity. HSV-1 stocks were proliferated Invero E6 cells and stored at -20°C till further use.

Cytotoxicity Study: Seaweed S.wightii i crude extract was proliferated on Vero E6 cells by the neutral dye uptake method in 96 well plates by the method of Rajabhandari et al., 2009 \[9\].

Antiviral activity of crude extract of S.wightii: Vero E6 cells were seeded in 96 well plates in 100 µl of the EMEM medium by serial dilution technique in four different replicas for a time period of 24h. Once the cells were infected with 30 µl of HSV-1 strain, TCID₅₀ was incubated at 37°C for 3 days i.e. 72h. Control samples were also maintained without viral strain and antibiotic act as positive control. sulforhodamine B assay (SRB) was used to determine the viability of cells by showing absorbance at 540nm and percentage was calculated.

Results and Discussion

The Crude Extract Yield: The Sargassum wightii sample was shade dried and powdered. The powdered sample was extracted and condensed using a Soxhlet apparatus. The percentage of the crude extract yield was 4.7 ± 0.27 in ethyl acetate and 2.6 ± 0.54 in methanol solvent. From the obtained yield in the crude extract sample showed a good amount of yield in ethyl acetate mid polar solvent compared to high polar solvent Methanol.

In-vitro Antiviral Activity of S. wightii Solvent Crude Extracts: Various fold of serially diluted solvent crude extracts results as showed in (Graph 1). Cytotoxic concentration₅₀ (CC₅₀) of the solvent crude showed 750 and 500 mg/ml of ethyl acetate and methanol, respectively. The Antiviral activity of solvent crude extract against HSV-1 showed significant reduction of virus on Vero cells. Among the solvent crude tested, the ethyl acetate showed effective IC₅₀ against HSV-1 at 300 µg/ml, while methanol extract showed at 500 µg/ml (Graph 2).

The reduction of HSV in the tested samples is due to the narrow action against HSV-1 than the Vero cells. Brown macroalgae, is rich in compounds like phlorotannins which have been analyzed to have anti-HIV\[13\] and anti-HSV activity\[10\].
Conclusion

The present study preliminarily focused on a crude ethyl acetate extract of *Sargassum wightii* is a suitable macro algae for the production of new drugs against HSV-1 due to the presence of the secondary metabolites[14,15]. Further studies are purified of the crude extract and Invivo studies can be performed to identify the extract drug for HSV-1.

Ethical Clearance: Nil

Source of Funding: Meenakshi Academy of Higher Education and Research, Chennai, India

Conflict of Interest: Nil

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Rheumatoid Arthritis: Treatment and Pharmacological Therapies

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Abstract
Arthritis is a persistent autoimmune ailment occurs more in females than in male above the age of 40. It initially affects the lining of synovial joint and the secretion of low synovial fluid also can lead to rheumatoid arthritis. It primarily affects the patient's health swelling in joint, redness and level decreases eventually. Diagnosis at an early stage of rheumatoid arthritis is the key to prevent from severe injuries in joint and other bone related diseases. There is also several plant based anti-inflammatory compound which involves in decreasing the pathogenesis of the ailment. There are several diseases related to rheumatoid arthritis, it includes pulmonary granuloma, vesicle damages and other symptoms are expected to occur early if unnoticed. This article discusses the risk factors, damages to joint and pharmacological therapies available for the diseases.

Keywords: Arthritis, Pharmacology, synovial joint, pathogenesis, anti-inflammatory.

Introduction
Rheumatoid arthritis or synovial hyperplasia is a provocative disease, occurs to damage the properties of joints. T cells, endothelial cells and antigen presenting cells that are majorly involved in the rheumatoid arthritis⁴. An addition to the inflammatory cells participation fibroblasts produced in the synovial membrane play an important part in the complications of RA. These fibroblasts exhibit the constant cellular activation, which is processed routinely in the non-appearance of inflammatory stimuli. In osteoarthritis patients, the synovial fibroblast shows the gene expression of proto oncogenes and its transcriptional factors which helps in the degradation of and it ends up with apoptosis. Here the complications develop as these fibroblasts stick to the cartilage to increasingly destroy the articular structures. The mechanism of RA is that it leads to the constant activation synovial fibroblast development. Dietary intake in a healthy manner contributes to the reduction of RA also having chance to reduce the occurrence of this disease at the young age. Hormonal levels are noticed in the pathogenesis of RA. By observing the above said complications, it is important to find the effective treatment strategies and therapies for rheumatoid arthritis would be essential ⁵.

Therapies for Rheumatoid Arthritis:
Methotrexate: The diagnosis of the disease, Methotrexate is prescribed by the doctors as a first line of defense and it is usually prescribed with 15-20mg of the week and gradually increased up to 25mg per week. It is usually as a combination medicine with

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glucocorticoids to compensate the mechanism. The production of this medicine is limited and based on the availability it is combined with other medicines. The combinations mainly result in adverse effects in patients when increasing the rate of administration. Increased level of dosage in patients sometimes leads to failure of methotrexate reaction because of the risk associated with this disease [3]. The long term study on this compound for RA showed highest recovery rate. It is reported in research articles that among the rheumatologists in the U.S methotrexate has a good recovery rate for RA also for other diseases [4].

RITUXIMAB

Rituximab a monoclonal antibody anti-CD20 recognized for the treatment of a rheumatoid arthritis. Bone marrow is located where B-cells are produced and it is an impactful therapy against the disease after the effective treatment with rituximab. The patients who took this compound have been observed in the clinical response later they were implemented with the B-cell treatment. Association of these two therapies helps the patients with longtime maintenance of the patients with RA. The effect of this treatment results in the production of protein and rheumatoid factor helps the patients in recovery of the disease. Patients treated with this therapy before the rituximab shows slow clinical response for RA. Anyhow, half of the patients regain their effect for the treatment with B-cell depletion therapy after the treatment with rituximab. Patients are observed for the risk development. The risks occur due to the dosage level of rituximab and people are prone to infection. The most common adverse effects are the level of IgG concentration associated with the rheumatoid arthritis disease [5].

Anti-TNF Therapies: This TNF therapy was identified in the year 1980’s for the pathogenesis of rheumatoid arthritis in animals and also in human. The evidence from this impact is studies in mice with TNF expressing factors. It revealed that the mice induced with rheumatoid arthritis could be prevented by stopping the production of TNF-alpha factor. There are three drugs mainly inhibiting the TNF are infliximab was tested in RA patients with clinical approval and the next is an Adalimumab antibody against the TNF factor and finally etanercept which was biologically approved to treat RA. Patients were improved after the treatment with these drugs. The TNF factor block was the major challenging in the improvement of treatment with RA [6].

Synovial Fibroblasts: The recovered rheumatoid arthritis patients were incorporated with synovial fibroblasts, which are present in rheumatoid synovium, which are considered as the destructor of causes for rheumatoid arthritis. After the incorporation it releases the increased amount of enzymes that prevent the cells from direct contact with RA cells. The endothelial cells that tend to act as the destroyer of articular cartilage. These are the ways how it recruits the cells to fight the RA with the help of macrophages, and T-cells and the rheumatoid synovium that attracts large amount of inflammatory cells that develops the activation of osteoblasts [7].

Cytokines: The activity level of cytokines is based on the secretion and the target of cell for the destruction. It clearly indicates that the response to inflammatory stimuli is just developed by the production of competing cells that are antagonists. Research studies have reported that the existence of polymorphisms of the TNF, and IL-1ra genes. Particularly the TNF-gene is situated on the chromosome 6 short arm in the HLA region. The abnormal high molecular weight TNF mRNA has been observed in the macrophages of murine and in monocytes of human that are infected with influenza A virus [8].

Eicosanoids and Lymphokines: These two immune agents are known to present in the inflammation process. In this process the lymphocytes and macrophages are activated to produce this agent eicosanoids which have higher efficiency to work against inflammatory cells. These two compounds can modulate the immune responsiveness. Proteases and collagenases which are known to degrade the secretion of cells and bone development which are related to many vascular diseases in the bone related diseases. TGF (Tumor growth factor-beta) produced by synovial tissues and lymphocytes can stop the process of inflammation. Fatty acids are the suppressors of T-cell proliferation. The major interleukins such as 1, 2 and the production of TNF are shown to have benefit in rheumatoid arthritis patients [9]. Rheumatoid arthritis with cognitive issue are related to skills in stress management and other symptoms. It is predicted that the treatment will show a reduction in symptoms and improve both immunological competence and the functioning of bones. The enhanced self-efficient, reduces pain and inflammatory cell proliferation in patients with RA [10].

IL-6: Interleukin-6 is one of the most potential therapeutic target pleiotropic proinflammatory cytokines.
It is produced by various cells, including lymphocytes, monocytes, and fibroblasts. It is involved in the multiple immunological processes of the immune cell activation. These cells are particularly in relevance with Rheumatoid arthritis, interleukin-6 induces osteo cell differentiation and it contributes to joint osteoporosis.[11]

**Celastrol:** The other bioactive component of TwHF, celastrol belongs to celastraceae family it has many anti-arthritic activity. The research studies have revealed that it can suppress that rheumatoid arthritis severity in the AA Lewis rat model. Moreover, it can suppress the proinflammatory cytokines production and balance Thymus cell to regulate the morphology in the targeted organ. Additionally, celastrol compound protects the erosion of bone by targeting certain pathways and the deviating osteoprotegerin level stops the osteoclastic activity which in turn reduces the damage in the bones[12].

**Curcuma longa LINN:** Curcuma is the anti-potent agent which grows in tropical regions, mainly in India and China. The turmeric heated with oil and applied all over the knees. The chemical compounds present in this plant are Sodium-Curcuminate, Curcumin and Methylcurcumin. In our tradition, it is used for healing antiseptic and possesses anti-helminthic activity. It is studied that herbal formulation produced from the turmeric plant works well with the arthritic patients. It is researched to possess anti-inflammatory activity, ant-fungal, anti-protozoal activity and hepatoprotective agents. The oil produced from the plant has high anti-inflammatory activity and anti-arthritic activity[13].

**Inula Helenium:** It is a perennial plant also known as horse heals. Importantly dihydroflavonols elicited from the aerial part of the plant showed anti-inflammatory activity. This compound significantly suppresses the activity in rat peritoneal leukocytes. These flavonoids are the components of viscosa plants reduce the leukotriene production. Elastin is the outer cell protein, has the automatic effect on dissimilar tissues. Hence it is referred as the contributory agent in the reduction of RA[14].

**Pluchea lanceolata:** This plant is one of the important medicinal plant having these anti-inflammatory and analgesic activities for rheumatoid arthritis, sciatica, edema and psoriasis. This involves the synthesis of different secondary metabolites viz., flavonoids and daidzein and the major compound pluchine from this plant contributes in the anti-inflammatory activity. The alcohol extract from pluchea plant showed maximum reduction in formalin induced arthritis in rats. The powder form of the plant is applied for arthritis[15].

**Madimadi:** It is a Korean based medicinal plant, fermented alcohol prepared from the extracts of *Madi madi*. It is found to be the curative agent for long time in the tradition of Korean medicines. It has an inhibition effect on the pro-inflammatory cytokine and dose dependent inhibition against of patients with RA with these interleukin-beta and interleukin-8. It also down regulates the alpha-tumor necrosis factor. It is a recurrent plant with creeper like structure found growing in Taiwan. The main active compound present is called triptolide has anti-inflammatory activity[16].

**Conclusion**

Rheumatoid arthritis occurs mostly in aged patients with many health complications such as swelling of knee, redness and motion reduction in the bones. The synovial fluid synthesis is the major cause of arthritis. It can be cured with many therapeutic agents when treated early with worthy medications. Some of the important plants also contribute to the anti-inflammatory activity, neurological disorders and patients suffering from sciatica. Monoclonal antibodies based therapies are most welcome in people from developing countries with highest medicinal facility. Still medicinal plant based drugs are mostly preferred for the cure because of its log term effects. This paper presented some of the important therapeutic agents both synthetic and traditional medicines for the patients with rheumatoid arthritis complications.

**Ethical Clearance:** Nil

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**References**


Studies on Phytochemical Analysis and Antimicrobial Activity of Sargassum Wightii

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Abstract

Introduction: Seaweeds are natural sources rich in active compounds used extensively by cultivating the weeds to cure various ailments. Sargassum wightii is distributed in coastal areas, especially in tropical regions.

Materials and Method: Seaweeds are collected from coastal area of Tamil Nadu and screened for phytochemical analysis by Evans method, total phenol content by Folin-Ciocalteau colorimetric method and antibacterial activity were performed by the well diffusion method.

Results: S.wightii was extracted in the ratio of 1:10 and phytochemical analysis of ethyl acetate extract showed the presence of various secondary metabolites. The S.wightii crude extract was screened for antimicrobial activity and showed good zone of inhibition against human pathogens.

Conclusion: S.wightii is a potent antimicrobial drug as it shows a good zone of inhibition against the harmful pathogens and the secondary compound screening proves the activity. So the S.wightii can be cultivated more and can be used for clinical purpose without any side effects.

Keywords: S.wightii, secondary metabolites, phytochemical analysis, Antimicrobial.

Introduction

The emergence of science in pharmaceutical industry explores the active ingredients from natural resources is the current era of development. In this scenario, seaweed gained the importance, especially against human pathogens and the cultivation has been started by the local people and supply of raw material is about 15 Million MT in one year as per the guidelines of[22]. Sargassum species distributed widely in external conditions where the temperature is humid and semihumid across the world and the characteristic feature of the plant is dark-brown, with approximately 30cm in height. S.wightii has branched leaves, stem like parts and root like holdfasts. This seaweed not only helps the pharmaceutical industry, but also act as supplementary food, fertilizer for plant enrichment and conversion of renewable sources.

Secondary metabolites derived from the innate source are not responsible for growth or reproduction [5] but minor quantities of these materials are very much helpful in producing new drugs in pharma industry, defense mechanism against harmful pathogens [8], hormones, enzymes[14] symbiotic activity[7], in agriculture and interacts with other species.

The bioactive compounds obtained from the seaweeds helps pharma industry as polysaccharide production[4], against bacterial, fungal pathogens[6,10], as a remedy for cancer[12,25] and against viral
The secondary metabolites consist of chemical structures which possess high therapeutic activities. The study from earlier researchers focused on phytochemical analysis, Nutraceuticals and medicinal value from marine macroalgae as food and in the field of research it is widely used in characterizing the medicinal properties\(^\text{19}\).

The current study focused on analyzing the crude extract of *S.wightii* for phytochemical analysis and Antimicrobial activity against the harmful pathogens. The outcome and aim of the research is to attain the knowledge of *S.wightii* and explore to the scientific world. Thus products from the natural sources are always advisable as a means of safer method without any side effect.

**Materials and Method**

**Sample location and extraction:** The sample was collected from the southern region of Tamil Nadu, i.e. Mandapam coastal area and was identified as *Sargassum wightii*. The sample was initially collected with forceps and a sterilized plastic bag and immediately after reaching laboratory sample has to be washed in running water followed by double distilled water and the entire process was left for a few days in shade condition and dried at appropriate temperature inside the room.

The dried sample was powdered and soaked in mid polar solvent ethyl acetate for a period of 3 days. The compounds will be eluted from the sample are mixed with solvent by frequent shaking or kept in shaker at 37°C for a fixed time period. The collected sample was pooled by filtration method and condensed using a rotary evaporator.

**Phytochemical analysis:** Screening of secondary metabolites from the sample *S.wightii* are alkaloids by Mayers reagent method\(^\text{20}\), Tannins, by Ferric chloride method and Flavanoids, by alkaline reagent and shinoda’s magnesium ribbon test\(^\text{9}\), Saponins and Terpenoids\(^\text{18}\) and cardiac glycosides by Keller-Killani method.

**Quantitative analysis of Total Phenol content:** The crude extract of *S.wightii* determines the total phenolics present in the sample by UV spectrophotometer and followed Folin-Ciocalteau calorimetric method\(^\text{17}\). The obtained total phenolic content was measured at 726nm and expressed by GAE in mg/g of dry sample.

**Antimicrobial activity of *S.wightii***: The most common technique to perform Antimicrobial activity is by the well diffusion method of Peela *et al.*, (2005)\(^\text{16}\) using the MHA medium. The test was performed against four bacterial strains and one fungal strain and the test results were observed for inhibition zone.

**Results and Discussion**

**Sample Extraction:** The sample was powdered and extracted with the solvent ethyl acetate in the ratio of 1:10 and sample was condensed using a rotary evaporator. The percentage of the crude extract yield was 5.2%. The solvent ethyl acetate was preferred because it elutes both polar and non polar compounds and the toxicity of the cell is very much low compared to other solvents.

**Crude Extract of *S. wightii* screened for Phytochemical analysis:** The secondary metabolites present in the ethylacetate extract of *S.wightii* is Flavanoids, Terpenoids and Cardiac glycosides and alkaloids, Tannins and saponins are absent in this extract. Flavanoids belong to phenolic group and rich in antioxidant activities\(^\text{2}\) and it helps in healthy circulation by strengthening the capillary wall\(^\text{15}\). Terpenoids are widely useful against various pharmacological activities by inhibiting the synthesis of cholesterol, antimicrobial and also acts as an anticancer agent\(^\text{13}\). Glycosides consists of sugar molecule adhered with non carbohydrate moiety and has sedative property and diuretic\(^\text{21}\).

**Table 1: Phytochemical analysis of crude extracts *S. wightii***

<table>
<thead>
<tr>
<th>Phytochemical Constituents</th>
<th>Ethyl Acetate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mayer’s Method for Alkaloids</td>
<td>–</td>
</tr>
<tr>
<td>FeCl(_3) method for Tannins</td>
<td>–</td>
</tr>
<tr>
<td>Shaking method of Saponin</td>
<td>–</td>
</tr>
<tr>
<td>Alkali and Shinoda’s method for Flavanoids</td>
<td>–</td>
</tr>
<tr>
<td>Sofowara method for Terpenoids</td>
<td>+</td>
</tr>
<tr>
<td>Keller Killani method for Cardiac glycosides</td>
<td>+</td>
</tr>
</tbody>
</table>

**Determination of total phenol content:** Phenols are a diversified group of natural element obtained from innate sources and distributed widely. The ethyl acetate extract of *S. wightii* were analyzed and showed 18.98 mg of GAE/g dry weight of phenols are present (Graph 1). The phenolic estimation is performed because the macroalgae *S.wightii* has redox property and has a high amount of antioxidants.
Well diffusion method against harmful pathogens: *Sargassum wightii* crude extract obtained from ethyl acetate were tested against four human bacterial pathogens viz., *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Escherichia coli* and one fungal pathogens *Candida albicans*. Antimicrobial activity of crude extract from *S.wightii* showed good inhibition to all the tested human pathogens (Figure 1). The antimicrobial activity was concentration dependant, when increasing concentration showed increased zone of inhibition. Among the solvents, the ethyl acetate crude extract showed more activity than the methanol extract (Table 2).

The antimicrobial activity was concentration dependant, where increasing the concentration showed increased zone of inhibition. The red and green seaweeds *Gracilaria edulis* and *Enteromorpha flexousa* at 60μg/disc, concentration showed effective antibacterial activity against *Klebsiella aerogenes*. The methanol extract showed highest activity compared with other solvents[1]. In challenge, our results showed maximum zone of inhibition from ethyl acetate extract.

### Table 2: *S.wightii* against harmful human pathogens

<table>
<thead>
<tr>
<th>Human pathogens</th>
<th>Antimicrobial activity in Zone of Inhibition (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ethyl acetate extract (µg/mL)</td>
</tr>
<tr>
<td></td>
<td>50</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>0</td>
</tr>
<tr>
<td><em>Klebsiella pneumonia</em></td>
<td>7</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>0</td>
</tr>
<tr>
<td><em>Escherichia coli</em></td>
<td>0</td>
</tr>
<tr>
<td><em>Candida albicans</em></td>
<td>7</td>
</tr>
</tbody>
</table>

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Obesity, Risk Factors and its Pharmacological Treatments

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Abstract

In recent years, Obesity has become one of the major health issue affected the children to adult people. Changes in life style, food habits and stress management has been the disease related problems not only for obesity for many health complications. Many of the drugs has been developed in the market to the availability of people. Some of the drugs produced by the pharmaceutical companies shows side effects after using the medicines. The most recently used drugs are Phentermine, Diethylpropion, Phendimetrazine, Benzphetamine, and Mazindol are referred for the obese patients for short term treatment. Sibutraminea, the sympathomimetic are referred as long term medication for the patients with obesity. Many of the drugs are banned from the pharmaceutical industry due to the adverse effects it has on patients health. This paper discusses the major reasons and issues related with obesity. The medications and treatments in available recent times are also discussed.

Keywords: Obesity, risk factors, treatment, BMI, Gynaecological Problems.

Introduction

The world Health Organization has reported this obese issue as “excessive and abnormal fat accumulates develops risks to health” it is usually calculated with the formula of BMI known as Body Mass Index it presents the level of fat accumulated in the body[1]. The available treatment options are set according to the range of body mass index, circumstances and other health problems are taken into record to avoid any future health complications. However for endocrinologists are trying to resolve the major health consequence of developing obesity and type 2 diabetic patients[2]. Research study on obese reports that around 30% of middle age european people are obese and in united states nearly around 3 lakhs people died every year those are obese. Obesity patients are tend to associate with the risk of developing higher mortality rate. The average obese body weight range patients are saved without any risk development. Life style changes, junk food eaters and lack of exercise among the people are the biggest causes of obese people. There are certain technologies available for the people such as anthropometric measurement namely skin-fold thickness, measurement of waist and hip range are used to assess the complications in obese patients associated with type 2 diabetes mellitus also cardiovascular diseases. In 2015-16 THE WHO has announced obesity as epidemic and this has arised worldwide about 1 billion and 600 million people are adults with obese. Public health sector has announced many health insurance schemes for aged people to recover their health[3]. Obese are also tend to develop gastroenterology disorders such as hernia, colon cancer, haemorrhoids so on [4].

Obesity; Risk Factors: The public are not aware of such health complications associated with obesity,
and how it influences people's life in the way of affecting health and economical imbalance in running families these are all the important problems related with the disease. It arise when the energy imbalance in energy utilized and spent in day to day life when the calories are not utilized properly it is converted into fat and gets deposited in the body. The major reasons for change in people behaviour towards health are the availability of nutrition and the less nutritious foods the industries growth all these problems affects the people health directly and ends up in obesity.

**Gynaecological Problems:** Obese women health definitely varies from normal health women. Starting from menstrual issues irregularities and amenorrhea that is long time absence of menstrual cycle. The menstrual issues in women arises because of the hormonal imbalance in the female body. This change is due to the upregulation of androgens and oestrogen levels and increased conversion of androgen to estrogen in female obese patients. Research studies also suggests that the obese women are more prone to endometrial cancer with the highest production rate of oestrogen in the endometrium. Types of cancers arise in obese are breast cancer gall bladder cancer and ovarian cancer. 70% of the obese women are developing polycystic ovarian disease or syndrome commonly known as PCOD or PCOS. During pregnancy this overweight issue leads to hypertension, diabetes and pre-eclampsia and big headed baby development are seen.

**Pulmonary Functioning Issues:** Research reports says that the obesity problem is related with sleeping disorders known as (OSA) OBSTRUCTIVE SLEEP APNEA. The enlargement of neck width range is associated with sleep disorder in obese patients. There are two major reasons to affect health because of the tissue fat has been attached in lumen and secondly the fat tissues blocks the airways and collapses the ranges of air passes through the way. Breathing issue asthma is critical disease even that may develop in the obese patients. There are also evidences provided to prove obese patients are developing asthmatic issues. Seventy % of the patients with asthma are diagnosed from the obese patients. Active mechanism is obese people are related with asthma complaint because of the hyper-responsive airways and decrease in function. The block of inhibitors results in the hyper reaction where the inhibited agents are cytokines, chemokines and adipocyte factor leptin.

**Coronary Heart Disease:** Obesity majorly affects the heart by blocking pathways by fat accumulation and increases the chances of getting cardiovascular disorder. The metabolic rate of obese patients compared with normal healthy patients are low in range leads to many diseases and disorders many heart disease. Hypertension reporting studies reveals that the adipose tissue containing fat are accumulated in high level is indicated by calculating the BMI (Body Mass Index). The blood circulation is reduced and pumping capacity of blood to the heart is reduced by the deposited fat in the arteries leads to severe hart blocks and heart attacks. Nearly millions of people die every year because of obesity related heart problems and attacks. Overweight and lacking in exercise and the fried food items are major reasons for obesity leads to cardiovascular diseases. Daily walking for 40mins can eventually reduce such coronary diseases by burning the excess calories we can reduce the fat accumulation in body.

**Anti-Obesity Medicines:** Many number of drugs are prescribed for obese people for weight reduction. These recent medicines are approved during past years. Some of the pharmaceutical companies still developing medicines for the obesity patients. Drug called topiramate anti-epileptic medicine used for migraine and roflumilast plays role in pulmonary disorders. Bupropion are known to treat depression. Other important drugs for the reducing weight is not the first line treatment but adopted for the obesity treatment. In developed countries phentermine and the drug diethylpropion are distributed largely in 1970. These releases medicinal compounds such as dexfenfluramine and fenfluramine. It is known that these agents had potential to develop hypertension of pulmonary and it was highly put under risk order which works against the weight loss process.

**Diethylpropion:** It is a compound consists of phenylalanine ring compound with small sympathomimetic property and present with stimulants shows effect thanamphetamine. Diethyl had approved by Food drug and administration for obesity treatment in 1959. It has been in use for weight reduction and the studies had been under evaluation for the use of this medicine for long term. Analysis called meta analyses assess the action of this diethylpropion drug for in different individuals and presented in the published report between 1960& 1980. These studies were carried out for at least more than 20 weeks. The obese patients are treated with these drug to ensure weight loss each.
individual has at least lost three kilo of weight without any side effects [9].

**Phentermine:** It is sympathomimetic anorectic medicine belongs to the phenylethelamine class pharmacologically relevant to the amphetamine. The action of this medicine is to work in the stimulation of hypothalamus in the adrenal glands releasing the nor-epinephrine reducing the abdominal fat [10]. To notice it is not established as a first line medicine such as amphetamine in treating the obesity by weight loss. Central nervous system activity and metabolic activity may be involved. FDA has approved this medicine to treat obesity for week based treatment named monotherapy because of this single medicine for weight reduction, physical exercise and calorie reduction in obese patients with highest BMI rate. TILL 2006 this medicine was prescribes as an anti-obese medicine in the U.S country. Some of these formulations had side effects also such as headache, increased heart rate and constipation [11].

**Cathin:** It is one of the anti-diabetic drug derived from the formulations of amphetamine drugs in the pharmaceutical industry for the past years of treatment for obesity patients. It is an alkaloid derived from the leaf of khat plant it is licensed to use in the short period of time for diet improper obesity. Pharmacology formulations of this plant works as an amphetamine drug utilizes which induce the anorexia and sensory simulating, urine retention associated disease. Variation in medicine dosage can increase heart rate and many safety related problems are considered while giving the medicine. Monotherapy of cathin can be prescribed for atleast 20 weeks and reported safe. The use of this medicine is not advised for long time and still cannot be identified even in many clinical trials specially with cardiovascular diseases [12].

Pharmacology is an major part in treating the obesity disease its role in weight loss is uncountable. Considering the major health issue and death rate are the complications taken into consideration by the industries to produce drugs that are available for people with obesity. Taking drugs can reduce the health ailments but real weight loss procedures should be followed by the patient to ensure healthy body The fact is the use of medicines for obesity will work only while you are using the medicines later it wont show its action. So use of medications is only a temporary path and having a healthy life still with exercise and taking nutritious food are the key to success [13].

**Weight Management:** A group of obese patients were analysed for weight loss in research it was separated into 3 groups and after period of six months patients from three different groups were put into weight loss pattern they all showed average range of change in their weight. The average weight loss were seen in different groups. The analysis were brought to secondary stage the patients with obesity are put into these group with mixed number of people from all the groups there was change in weight loss pattern. These patterns are finalized and revealed that these low-energy intake of diet shows the effects in weight loss treatment. Hence it is proved that weight loss is possible with proper diet intake. Reduced calories will burn fat and also stops the accumulation of fat in body of both male and female [14].

**Food Systemic Approach Preventing Obesity:** Attention seeking towards current policies and system for food may create an impact towards public health and things related to diet may reduce the diseases in chronic level. An organizational authority of food system says that the food should be available for all the people that is availability of food, and accessibility of food and affordability to all the people. Reduction in healthy food supply induces the malnutrition in children it also creates many deficiencies in human health. There are efforts taken to reduce the space between the science people and public policy related issues that requires changes in the improvement of food availability and healthy living of people in the risky population [15].

**Dietary Therapy:** Obesity patients can receive charts and patterns for the diet intake from nutritionists according to their weight loss goals and risks in their health. The obese should follow the medications properly for long time and some of the changes should take place in their life style diet intake for the patients. To follow these procedures patients should participate in the health programs conducted by the health institutes. Normally fiber, grains and fruit juice consumption plays a major role in weight reduction. Fruits intake 30% in daily diet can reduce 70% of weight in obese patients recommended by nutritionists. Weight loss process with some nutritious food for a long period of time helps in weight loss also for healthy living of people [16].

**Conclusion**

People have awareness towards a healthy lifestyle and exercises are less nowadays. That should be managed and maintained by people for make a disease free life.
So many health complications are followed in the absence of healthy diet such as cardiovascular diseases, neurological disorders, memory issues, menstrual problems in women and also developing cancers in many obesity patients. All these can be avoided by having a healthy diet and following exercises are key to have healthy life. Alcohol consumption is also one of the major health complications related to obesity. To avoid these complications and to maintain a healthy lifestyle these implications should be followed throughout the weight loss process to lead a disease free healthy lifestyle.

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**References**

Combinational Therpies and Drugs for Diabetes Mellitus Type I and Type II

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Abstract

Diabetes mellitus is a metabolic disorder causes changes in the blood glucose level either it can be elevated or lowered. These are classified into two type insulin dependent and insulin non-dependent. The basic treatment provided for diabetic patients are insulin therapy it has been clinically proven but this is not the only solution to cure diabetes. Metformin is widely used medicine for patients. Glucose lowering therapy is applicable for patients with severe hyperglycemia, hepatic and renal related diseases. The therapeutic applications such as The therapeutic medicines exenatide and to induce the insulin secretion and also liraglutide helps people with insulin. Other therapeutic compounds heals the defects of beta-cells secretion are compensated with the use of stitagliptin to inhibit the dipeptidyl peptidase-4 (DPP-4) enzyme, and increases the the function of Islets cells. This article further discusses about the combinational therapies available for the diabetic patients.

Keywords: Diabetes, therapies, drugs, mellitus.

Introduction

Diabetes mellitus is considered as life-threatening metabolic disorder worldwide. In recent survey around 300 million people got affected with this disease with the diagnosed rate of 8% and 50% undiagnosed [1]. The maximum people with middle income are found to be diabetic related with stress, unhealthy diet with the age group of 45-55 in the population. In the estimation of recent survey by ICMR collaboration with china predicts in the survey an estimation of 99 million people with the case history and the future predicted survey says that in upcoming years 6 million people are tend to get affected. There are few incidence that makes people with diabetic are prone to cardiac related disease in the east Asian countries. There are chances to get diabetic in people with obesity. There are the major health complications in diabetic patients[2]. The drug metformin is utilized as the combinational therapy medicine for type 2 diabetic patients. It was available in Europe and U.S. and approved in the year 1995. The usage of metformin has adverse effects for the patients with increased level of serum creatinine. It should be properly prescribed with mg level in elder patients around 80 yrs of age because of the complications in renal functioning [3]. Attaining the targeted glycaemic level is of utmost importance the initial stage in use of combinational medicines leads to reduction in HbA1c. Combinational therapy for types 2 diabetic is more risky than type 1 because type has more metabolic defects. Hypoglycemic patients cells can have an impactful memory of vascular cells of the

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target organs creating a metabolic memory leads to complications in future. Diabetic people those who are with poor control leads to develop risk factors [4].

Preclinical studies in recent establishment of medicines for diabetes: FDA has approved many drugs of combinational therapy for diabetic patients also to avoid side effects which leads to immunosuppression in patients. The ultimate standardization approach to achieve approval can be developed. Type 1 diabetic patients approval of medicines requires a panel of members with animal models to develop medicines for FDA approval. To ensure even formulations of medicines it is compared with standards and compared with operating procedures it is presented and multiple data has been stored. Such consortium can consist diverse laboratories developing the preclinical models in standardizing the procedures to get the approval from Diabetes combination therapies assessment group. This formation will allow two or three labs work to test the combinational medicines. The protocols from all laboratories will put to standardization so that the therapeutic medicines turn as a GMP material known as good manufacturing practise. The ultimate goal of this initiatives are to provide quality preclinical-data for the novel combinational medicines therapies for type 1 diabetic medicines [5].

Type I Diabetes mellitus Combinational Medicines:

Rapamycin: It is an inhibitor of non-calcineurin used in the prevention of graft rejection after the allogenic transplant. Additionally administering the rapamycin drug prevents the type 1 diabetes in mice. This drug rapamycin drug for humans provided for juvenile for beta cell replacement diabetes research foundation center. The research studies revealed that recipients of renal transplant t-cell depletion by inducing CAMPTH-1H. The clinical protocol in using rapamycin therapy is provided to type 1 diabetic patients before transplantation of islets to reach therapeutic plasma level before infusion of islets that follows rapamycin mono therapy. Rapamycin has an effect on human nTreg function, which supports its clinical immuno suppressant agents for tolerance.

Stem Cell Therapy β-Cell Immunomodulation: BETA-cells for therapy is a major challenge. Limitations of using stem cells represents ultimate potential of stem cells to regenerate the cells and immunomodulation potential. The capacity to renew to turn from differentiate into specialized cells can be a useful for glucose supply and insulin producing cells for transplantation. The mesenchyma cells and hematopoetic cells can aid to retrieve the beta cell destructors and facilitates the regeneration of cells. Hence the cells with these potency can be utilized in beta-cell therapies to reverse hyperglycemic in type 1 diabetic patients. These Stem cells can be produced from various sources obtained to test their potential to restore homeostasis or to enhance the survival in transplant patients. It includes pluripotent stem cells, embryonic stem cellsand bone marrow-mesenchymal cells and adipose tissue-derived cells and the cells that secretes in the ductal epithelium Beta-cell progenitors are found [6].

Peptide Hormone Therapies: Peptide hormone mimics the cells. The peptide (GLP-1) Glucagon-like peptide are widely being used to treat the diabetes and obesity. Pre-clinical data deposited that strongly suggests the benefits of many hormonal peptides, which develops the potential type 1 diabetes treatment. Including the potential regulation of glucose and secretion of insulin, beta cell preservation and increases the insulin sensitivity. The pre-clinical study exposes the GLP-1 therapeutic utilization of insulin in type-1 diabetic patients. It demonstrates the reduction of postprandial glucose excursions, production of decreased glucagon and the delaying of empty the gastric in patients insulin uptake and combination with GLP-1R as compared with insulin therapy. The study demonstrates the controlled glycaemic level in combinational therapy with anti-IL2 antibody [7].

Therapeutic Drugs for Type II Diabetes mellitus:

Type II α-glucosidae inhibitors: Acarbose, miglitol and the voglibose are the currently available medicines for type 2 diabetic patients. These medicines are currently available for anti-diabetic property it possess for the mode of action. Mainly the acarbose has been utilized for more than 10 years in the treatment of diabetic mellitus. These inhibitors take role in reducing the triglycerides but improving their effect on low density and high density lipoprotein levels are inconsistent. This inhibitor sometimes rarely induce the hypoglyciathese do not stimulate the insulin level and do not disturb the weight of patients. Acarbose inhibitor has reduced the risk of cardiac related disease shows progression in patients with glucose intolerance [8].
**Gut Microbiota:** Human gut consist beneficial bacterium, identified as gut microbiota. These microorganisms consists essential functions gut microbiota serves several essential functions in vitamin production such as vitamin k, folic acids to enhance energy production. Research studies have reported that the colonizing bacteria contact happens in birth canal. In this therapy the microbiomes have found in amniotic cavity, amniotic fluid and in umbilical cord.In infants the microbiota composed of materials are completely different from adult people. After three years of birth the microbiota has developed to the maturation stage which is essential throughout the adult stage. The major diseases are prevented by the developments in human body. Studies revealed that animal models and in adults had demonstrates that microbiota improper function can lead to the development of obesity in type 2 diabetic patients.There are chances of fluctuation in the energy level of healthy individuals these inhibits the insulin resistant and and develops dyslipidemia are developed by low anti-bacterial activity [9].

**Thiazolidinediones:** These Troglitazone has been found in the year 1997 in the type 2 diabetes milletus. These are removed from the production companies because it causes liver toxicity. With the use of medicines patients gained weight after taking troglitazone medicine. This medicine sticks with the peroxisome activator proliferation and gamma nuclear receptors affects the gene regulation. This alteration transcription of gene takes place in adipocytes and the primarily concerned genes participate in regulation of fat metabolism. This reduction in fatty acids eventually regulates the production of insulin. This FFA develops the beta cell function by reducing the lipotoxicity. The toxicity leads to cell death in beta cells [10].

**Pioglitazone:** This drug is used as a mono-therapeutic agent combined with metformin (increases anti-hyperglycemia). These compounds such as meglitinide works well in diabetic patients with metabolic disorder associated with type 2 diabetic patients. Low dosage is recommended per day. It shows a relevant mode of action and adverse effects in liver toxicity when compared to rosiglitazone. It can also interact with another medicine that are functioned by enzyme p45 and change the level of serum. Contraceptive drugs used in higher dosage in diabetic female who does not want to get conceived [11].

**Sulfonylureas:** The first and second generation nature of this compound binds with the receptor of sulfonylurea present in the pancreatic beta cells surface and it ultimately leads to the increased range of secreting insulin. These cause changes in potassium channel and depolarization in the membrane of the cell. These calcium channel pave way to an influx in calcium and increases insulin secretion in pancreas. The first generation medicines are with low potency compounds include (diabinase, dymelor, to linase). The second generation medicines easily penetrate through the cell membranes [12].

**Sodium Glucose Cotransporter 2 Inhibitors:** These inhibitor targets the organ kidney to develop the glucose in excreta from urine and eventually decreases hyperglycemic condition. In normal condition, organ reabsorbs the glucose filtered. Hence no glucose is excrete from the urine samples. Glucose re absorption happens at the proximal tube, by the help of glucose protein SGLT2. The expression of this protein seem to be increases in type 2 diabetic patients. Re-absorption capacity is increased by inhibiting the protein for reabsorption of glucose decreases the hyperglycemic condition. This inhibitors can be utilized in different combinations, different types of agents aids in lowering the glucose [13].

**Hybrid chimeric peptides:** The combinations of two peptides are injected to the patients has developed with the molecules hybrid are two peptide molecules and the amino acids linked the peptide molecules to form a single compound. For instance gluacon peptide has been mixed with the gastrin eventually improves the control glycaemic condition in patients and also controls the beta cell mass. It is also linkswith glucagon improves the energy level and leads to weight reduction. Possibility to arrange chimeric peptides with good properties to deliver the desirable effects through the receptors of targeted cells. The acute reaction, immunogenecity and physio chemical challenges are considered in the development of drugs [14].

**Patho-Therapeutic processes:** The action of anti-diabetic medicine is pharmacologically inactive sometimes. In the beginning stage, pharmacologists focus in the sugar level in blood and intake of food and digestive compounds related to glucose. Development of novel drugs for the type 2 diabetes milletus should be diverse and helpful without any complications. Therapeutic medicines are related with coronary diseases and obesity that should be avoided while designing a drug. Experimental studies should develop and enhance
the mode of action of drugs. Accordingly, we should not rely on one or two therapeutic pathways. Generally these medicines are not toxic when compared to high risk synthetic drugs.

**Exenatide:** This drug mimics the incretin protein which has glucose regulating molecules having glucoregulatory activities related to hormonal peptide glucagon. The activity includes the blood glucose-dependency enhances the secretion of insulin. The drug enhances the glucose level for secretion of insulin mediates the binding of exenatide with glucagon with pancreatic cells. The glucagon peptide improves the cell function by using the drug in exenatide by increasing the gene expression involved in secretion of insulin and the augment the beta cell mass. This peptide controls the intake of food and helps in weight loss increases insulin effect in body.

**Conclusion**

These therapeutic drugs are available in recent years considering uncontrollable diabetic cases in India and all over the world. The developed countries life style and lethargic manner in junk food intake are also the reasons for developing diabetic mellitus metabolic disorder. The therapeutic drugs mainly helps to reduce the weight and improves the metabolic rate in diabetic patients. This should be taken into consideration by people to change their idea of having irresponsible changes in life style. The use of combinational therapeutic drugs will eventually help people with type 1 and type 2 diabetic patients for the well being of highest population.

**Ethical Clearance:** Nil

**Source of Funding:** Meenakshi Academy of Higher Education and Research, Chennai, India

**Conflict of Interest:** Nil

**References**


Epithelioid Hemangioendothelioma–Two Rare Case Reports with Review of Literature

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Abstract

Epithelioid hemangioendotheliomas (EHE) are decidedly are form of hemangioendotheliomas with biphasic histopathological components. It is known to occur rarely in head and neck region. They are known to have aggressive behaviour with depictable recurrence rate and metastasis. Here we present two cases of epithelioidhemangioendothelioma with review of literature.

Keywords: Hemangioendothelioma, Epithelioid, Vascular Neoplasms, Metastasis, immunoreactivity.

Introduction

Hemangioendotheliomas (HE) are rare proliferative vascular neoplasms, known for its intermediate biological behavior that ranges between benign hemangiomas to malignant angiosarcomas.[1-6] Its clinical behavior and disease course remains unpredictable even amongst its histological types namely epithelioid, kaposi’s and hobnail form (Dabska-retiform). Epithelioidhemangioendotheliomas (EHE) are decidedly are form of hemangioendotheliomas with biphasic histopathological components composed of characteristic short cords and nests of proliferating round to epithelioid endothelial cells as well as spindle shaped endothelial cells. It is known to occur in any soft tissues but primarily in abdomen, liver, lung, extremities and also rarely in head and neck region.[2-6] Epithelioidhemangioendotheliomas are known to have aggressive behavior with exemplified recurrence rate and metastasis, than any other types.[7-9]

The exact nature of intra oral EHE is not clearly established because of its rarity. Till now only thirty four cases of intra oral EHE cases have been reported in English literature, including current two cases.

Case 1: A 35 year old female patient reported to the dental clinic with a chief complaint of red to pink, painless swelling in right lateral border of the anterior tongue (Fig. 1). The swelling was present for past three months which increased gradually to the present size of 3x1 cm². It is a lobulated, ovoid mass with a sessile base. The clinical differential diagnosis of hemangioma, fibroma, and pyogenic granuloma, was considered based on the clinical appearance and incision was performed after routine investigations.

The microscopic examination revealed plenty of tiny blood vessels lined by round to oval and spindled epithelioid cells, exhibiting eosinophilic cytoplasm with vacuolization arranged in short cords and nest (Fig. 2). Mitotic figures were minimal in number. The overlying epithelium was stretched and hyperplastic with surface ulcerations. Based on this diagnosis of EHE was considered. The tumour cells also exhibited immunoreactivity for CD31 confirming the endothelial nature of epithelioid cells and negative expression for cytokeratin and thus EHE was confirmed.
Chest radiograph was taken to rule out metastasis. Complete excision of the lesion was done. Patient reported after three months with no recurrence and complications and failed to report back further.

**Case 2:** A 22 year old male patient reported to a dental office with a complaint of solitary painful, mass in the buccal mucosa for past six months. The swelling was red to grey in colour with surface ulceration in the center of the mass. The swelling developed gradually to the present size of 3x2 cm$^2$. Patient gives frequent history of trauma on mastication otherwise no other symptoms were elucidated in relation to the growth. Family and personal history was unremarkable.

Provisional diagnosis of traumatic fibroma was given. Incision biopsy was performed and tumour mass was submitted for histopathological analysis. Tumour was yellow to grey solid mass with soft to firm consistency. The microscopic examination revealed cords and nests of proliferating spindle cells along with round to oval epithelioid cells with eosinophilic cytoplasm and intracellular vacuolization indispersed within a loose fibrovascular connective tissue stroma with plenty of tiny blood vessels. Few mitotic figures were evident. Overlying peripheral epithelial lining was also evident. Positive immunoreactivity of tumour cells for CD31 confirming the endothelial nature of epithelioid cells and negative expression of cytokeratin was elucidated. Considering the histopathological and immunohistochemical features, diagnosis of EHE was made.

Surgical excision of the tumour was performed and the patient was disease free till follow up examination of 16 months.

**Discussion**

Hemangioendothelioma is rare proliferative vascular neoplasm with intermediate malignant potential$^{[3,9]}$. The variable behavior of the neoplasm, led to its compounded terminologies such as histiocytoidhemiangioma, intravascular bronchioalveolar,malignant hemangioendothelioma, cellular angiomma of infancy, angioendothelioma, angioblastoma and led to the categorization of HE as an intermediate tumors or borderline tumor.$^{[1,2,6,10-12]}$ Though the concept of intermediate or borderline tumours remains complex and ill defined, it was designated to tumours with uncertain behavior. It was described as early as 1899 by Boremann,$^{[4,5,8]}$ and was introduced particularly in vascular tumours by Enzinger and Weiss and latter added to WHO classification in 2002$^{[3,4,6,9]}$. These HE lack consistent clinical and histological behavior with limited number of reported cases, fails to elucidate the exact biological nature of this tumour.

The first case of oral HE occurring at gingival was reported at 1975 by Wisely et al, as “primary malignant hemangioendothelioma”. Later in 1986 Ellis and Kratochvil reported twelve cases. The three histological variables listed under HE are epithelioid, kapossis and hobnail (dabska-retiform). Amongst is histological type, EHE are relatively rare, aggressive member of this group with unpredictable behavior with increased tendency for recurrence and metastases.

A wide range of age group is being affected ranging from first to seventh decade of life with mean age of 34.7 years. Men and women are equally affected except few authors believe slight female predilection in those occurring in extremities.No predisposing factors have been claimed for its occurrence except contraceptives usage in females as mentioned by few authors$^{[10,11,16]}$.

Clinically, lesion appears as a solitary, painful to painless red to grey soft tissue mass with size not greater than 2 cm hinting for benign nature and confuses with more common lesions such as pyogenic granuloma, fibroma, fibroepithelial polyp, peripheral giant cell granuloma and hemangiomas$^{[1,11]}$. Radiographic details are usually non contributory, showing a mild bone resorption. Normally excision is performed considering other common benign lesions as provisional diagnosis.
Histologically, these lesions are characterized by proliferating sheets, cords and islands of eosinophilic round to oval shaped epithelioid cells intermixed with strands of spindle shaped cells around proliferating tiny blood capillaries (Figure 3&4). The morphology of cells is epithelioid in shape, with round to oval nucleus with occasional intracytoplasmic-lumina. The classic intracytoplasmic-lumina (vacuolization) with round to oval vesicular nucleus are the distinct feature of EHE (Figure 5). The lumen is frequently filled with RBCs may account for a primitive vessel formation and also suggests the endothelial origin. Frequently collagenous and myxohyaline areas are reported in tumor stroma[4-6], which was evident in the second case. Few authors attest it could possibly be a sulfated acid mucin from vessel wall [2] and also specifies the endothelial nature of the lesion. Infrequently few areas of calcifications, multinucleated giant cells and mitotic figures are also reported [3,4,6,9]. Angiocentricity is not very well appreciated in oral lesions in contrast to cutaneous lesions, where only less than 9% of oral lesions showed history of pain, ischemia could be the probable reason for pain[1,6]. Advent of cytology in diagnosis of EHE occurring in other extra oral sites were found useful, and showed 85% positivity in reported cases. However its usage in oral lesions as an adjuvant, not yet described.

Immunohistochemistry plays a confirmatory role in rendering diagnosis as well as differentiating it from other histologically similar lesions [4,6,7,9,13]. Look alike lesions includes epithelioid sarcomas, other metastatic carcinomas and vascular lesions like epithelioidhemangiomas, epithelioidangiosarcoma and epithelioid spindle cell hemangioma. Endothelial markers such as CD 31, CD 34, CD 68, Factor VIII were used in previously reported cases to aid in diagnosis of the vascular nature of lesion. While the epithelial markers like cytokeratin, epithelial membrane antigen are frequently found negative and excludes the epithelial origin[1,5,10,17]. It permits us to presume that, these epithelioid cells are altered endothelial cells rather true epithelioid cells. Few case reports with focal cytokeratin positive immunoreactivity[1,10,14] also complicates the diagnosis, however the knowledge of the pathologist along with the adjuvants contributes in differentiating further. The positive immunostaining for CD 31 cytokeratin and negative staining (Figure 6&7) confirmed the diagnosis assisted in removing other differential diagnosis including epithelioid sarcomas and other metastatic carcinomas which are frequent and indigenous to the tissue of origin.

Local recurrence is not uncommon in EHE but intra oral cases accounts relatively lesser frequency, compared to those occurring in other anatomical site. Out of 34 cases, collective sum of earlier reviews and the current review, affirms the raise in propensity of recurrence at the rate of 22.5% in intra oral cases, specially with gingival cases [7,19]. It is not unknown for EHE to metastasis, especially to the regional lymph nodes, at the however distant metastasis is seldom noticed. Despite features like cellular pleomorphism, altered nuclear cytoplasmic ratio, increased number of mitotic figures (more than 3mitosis/50HPF) [6,7,18,19], metaplastic bone formation, areas of necrosis and few authors prefer including the tumour size greater than 3cm diameter, can be considered for predicting the recurrence and metastasis. It requires more clarity, to claim it as a criterion, since much times, lesion also develop metastasis and recurrences from an indolent lesion with bland histopathology. Multicentiricity of EHE is a well appreciated, frequent event in extremities and found have better prognosis than the unifocal ones, whereas, it is exceptionally rare in oral cavity.

Wide excision is a preferred treatment of choice, reflecting the intermediate malignant potential of the tumour but recurrence is commonly associated with inadequate excision. On other hand adjuvant therapies such as radiotherapy and chemotherapy are frequently suggested, for recurrent cases, merely found effective. Mortality rate in relation to oral EHE is not recorded till date that assents us to consider oral lesions are relatively less aggressive compared to those occurring in other areas of body.

Thus oral EHEs are rare intermediate vascular neoplasms, with increased tendency for recurrence and metastasis appears frequently as a sessile benign lesion. Considering the raise in recurrence rate especially with those occurring in gingiva, all lesion with high vascularity should be considered as a common differential diagnosis. Those diagnosed with EHE, should be evaluated for, recurrence and metastasis with long term follow up. In both the cases did not present any atypical features microscopically, chest radiograph were also evaluated, in order to exclude the possibility of metastasis and also insisted on frequent follow up to rule out recurrence.
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A Rare Presentation of an Oro-Antral Communication after Trimble’s Modification of Lefort I Osteotomy

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Abstract

Lefort I osteotomies are one of the most commonly performed surgeries in the maxillofacial spectrum. There had been reports of umpteen number of complications after Lefort I osteotomy. The authors present a case of an oro-antral communication after Trimble’s modification of Lefort I osteotomy, which has not been published before in the English literature.

Keywords: “Oro-antral communication, Trimble’s technique, Lefort I osteotomy, Buccal advancement flap, Buccal pad of fat.”

Introduction

Le Fort I osteotomies are routinely employed in the correction of various dentofacial deformities. They are associated with a wide number of complications ranging from an abscess to total unilateral blindness [1]. Occurrence of oro-antral fistulas are a rare complication after Lefort I osteotomies and there has been no report in the English literature documenting the occurrence of an oro-antral fistula after Trimble’s modification of Lefort I osteotomy.

The authors present a case of oro-antral fistula after Trimble’s procedure, with explanation of the probable etiologic factor and its management.

Case Report: A 24-year-old male patient who reported to Meenakshi Ammal Dental College and Hospital was examined and diagnosed with midface hypoplasia, vertical maxillary excess and mandibular prognathism. After pre-surgical orthodontics and cephalometric analysis, it was planned to advance the maxilla by 7mm and impact it by 6mm. Intraoperatively, Trimble’s modification of Lefort I osteotomy was performed to mobilize the maxilla and the necessary movements were accomplished. Adequate closure of the extracted third molar socket was achieved. The patient had an uneventful immediate postoperative recovery.

At the end of the first post-operative week, the patient presented with a complaint of watery leakage from the right nostril, on intake of fluids. Clinical examination revealed a wound dehiscence on the maxillary right third molar region. The authors confirmed the presence of an oro-antral communication of about 5mm on the region adjacent to maxillary tuberosity, where the right third molar was removed (Fig. 1). On the following day, the communication was closed in layers with buccal fat pad and buccal advancement flap (Fig. 2). The patient was followed up for three months and he had a satisfactory healing (Fig. 3).
Discussion

Since the first descriptions of Lefort I osteotomy by Wassmund\cite{2} and Schuchardt\cite{3}, there had been suggestions of several modifications by various authors\cite{4,5}. Trimble et al proposed a modification by advocating the placement of vertical posterior osteotomy cuts through the tuberosity. This technique has considerable advantages over the conventional technique as it is anatomically less hazardous, allows greater segmental mobility and also permits maintenance of a larger vascular pedicle\cite{6}.

Lefort I osteotomies are associated with a varied number of complications. Occurrence of oro-nasal/oro-antral fistulas are rare complications after Lefort I osteotomies. Steel et al reported that oro-nasal fistulas are more common than oro-antral fistulas\cite{7}, specifically in anterior segmental osteotomies and Ho et al recorded an incidence rate of 5% for oro-nasal fistulas\cite{8}. Midline osteotomies are more commonly associated with palatal tears due to the thin palatal mucosa and these are less likely to heal.

Khandelwal et al defines oro-antral fistula as an epithelialized pathological unnatural communication between the oral cavity and maxillary sinus \cite{9}. Initial treatment of oro-antral fistula includes routine sinus management with decongestants, nasal spray, antibiotics and obturation of open fistulas by using a soft “suck down” material for shrinkage or elimination of fistula\cite{10}.

Numerous surgical procedures have been recommended by various authors for the closure of oro-antral fistula. These procedures maybe categorised into local flaps, distant flaps and tissue grafting.

The Rehrman buccal advancement flap is the most common method implemented in the closure of oroantral fistula. After debriding the epithelium, the defect is covered with a buccal mucoperiosteal advancement flap. The shape of the flap is trapezoid, with its base at the buccal sulcus to ensure maintenance of adequate blood supply. The major disadvantage of this technique is that it leads to reduction in the vestibular depth\cite{11}.

The buccal pad of fat (Boule de Bichat) is a simple lobulated mass which is covered by a thin capsule and located inside the masticator spaces. Since Egyedi reported the use of buccal pad of fat in the closure of oro-antral fistula\cite{12}, several authors have utilized them to a good effect\cite{13,14,15}. The advantages of this technique
include ease of harvesting, good epithelialization and a high success rate\cite{9}.

Batra et al have demonstrated a double layer flap closure method wherein, a buccal fat pad flap was advanced to cover the oro-antral fistula, followed by a layer of buccal mucosal advancement flap over it\cite{11}.

To the authors’ knowledge, there is no published evidence of an oro-antral fistula in relation to maxillary third molar socket after Trimble’s technique. The authors feel that despite adequate closure of the extraction site, the advancement at the site of third molar socket might have created more gap between the bone segments, predisposing to a larger communication. The authors performed a two-layer closure with buccal pad of fat and buccal advancement flap, which ensured excellent healing within a span of 2 weeks. The authors advocate that extreme care is necessary while suturing the third molar socket after osteotomies to negate the occurrence of such complications.

**Ethical Clearance:** Nil

**Source of Funding:** Meenakshi Academy of Higher Education and Research, Chennai, India

**Conflict of Interest:** Nil

**References**

Role of HRCT Temporal Bone in Diagnosis of Chronic Suppurative Otitis Media in Correlation with Intraoperative Findings

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Abstract

This study aims to evaluate the role of preoperative HRCT temporal bone in the diagnosis of the disease, its extension and complications and plan for surgery. The involved structures and also in knowing prognosis is compared with Intraoperative findings made by the surgeon to know its precision in diagnosis. It also helps in diagnosing intracranial complications of CSOM at an early stage and help to plan surgery. Patients presenting/Suspected to have CSOM who were planned for mastoid exploration surgery in Department of ENT, within a period of 2 years–from February 2019 to September 2020, were taken up for study. The patient will undergo HRCT temporal bone with Aquilon 160 slice CT scanner producing sub millimetric thin axial scans Following areas of interest were looked up in preoperative scans:

- Pneumatization of mastoid
- Tegmen tympani erosion
- Facial canal dehiscence
- Ossicular status
- Extent of disease
- Sinus plate erosion
- Lateral semicircular canal dehiscence
- Disease outside middle ear cleft

Out of total 30 patients of CSOM, 26 (52%) were males. Majority of the patients (70%) were in the age group of 11 to 30 years. Left ear was involved in 40% of the patients. Majority of the patients (80%) presented with chief complaints of otorrhoea. In the present study, External Auditory Canal (EAC) was seen normal in majority of patients (82%) both radio logically and per operatively. HRCT scan was found to be highly sensitive (100%) in diagnosing cholesteatoma. CT scans diagnosed erosion of malleus with 100% sensitivity and specificity and erosion of incus with 91% sensitivity and 100% specificity. HRCT has a very high reliability for diagnosis of erosion of scutum, erosion of ossicles and its disruption, Pneumatization of mastoid, anterior lying sigmoid, extent of cholesteatoma in the middle ear and MAC. The study concludes that HRCT can be recommended not just for symptomatic cases but in all suspected cases in knowing the extent of the disease thereby reducing the morbidity.

Keywords: Cholesteatoma, Chronic suppurative otitis media, HRCT temporal bone, Middle ear, Otitis media, Otorrhoea investigation, HRCT unsafe ear.

Introduction

Chronic otitis media (COM) is the chronic inflammation of the lining formed by mucoperiosteum of the middle ear cleft. Overcrowding, poor socioeconomic status, illiteracy and poor hygiene are all factors, which play an essential role in this disease. The prevalence of COM is around 65 to 330 million people. Over 90% of
the burden is borne by lower socio-economic countries, India was found to have the highest prevalence (around 7.8%).

Chronic otitis media causes persistent foul-smelling ear discharge and leads to conductive hearing loss. The patient can develop intracranial and extracranial complications. Myringoplasty can be performed if there is a dry and inactive perforation for 3 to 6 months.[1]

HRCT Temporal bone is a common modality available in diagnosing and knowing the extent of the disease, and can inform the surgeon of its extent, severity, and associated pathologies. It’s fairly cheap and easily available. HRCT has proved to be better than plain CT and can visualize areas that cannot be visualized by the endoscope.

The purpose of the study is to compare the diagnostic accuracy of HRCT temporal bone in diagnosing CSOM with its severity, extent and associated pathologies in correlation with the intraoperative findings to know the diagnostic efficacy of HRCT. The study is conducted in the department of Radio-diagnosis for over a period of 2 years.[2]

Materials and Method

This present study entitled “Role of HRCT Temporal bone in diagnosis of CSOM in correlation with intraoperative findings” is a prospective study done in Meenakshi Medical College & Research Institute from February 2019 to September 2020. After obtaining approval from the ethical committee this study was done on 30 patients with CSOM. Written informed consent was obtained from patients.

Patients with complaints of pain, foul-smelling ear discharge referred from departments of Otorhinolaryngology to the Department of Radio diagnosis at Meenakshi Medical College Hospital & Research Institute and are scanned by TOSHIBA PRIME Aquilion 160 Slice Computed Tomography machine by the technique described below[3]

Technique:

- Slice thickness: 0.8 mm
- Reconstruction algorithm: high spatial frequency or “sharp” algorithm
- kV(p) 120
- mA less than 80; mAs
- Scan (rotation) time: as short as possible (e.g., 0.8 s)
- Scan mode: Spiral mode
- Contrast – None
- Inspiratory level: Not needed
- Position: Supine
- Acquisition: spaced axial imaging
- Reconstruction: Coronal and sagittal
- Window: Window Width 2000 H and Level at -700 H

The parameters compared with intra operative findings are Pneumatisation of mastoid, extent of disease, tegmen tympani erosion, sinus plate erosion, facial canal dehiscence, lateral semicircular canal dehiscence, Ossicular status, disease outside middle ear cleft.

Result

Table 1: Age distribution

<table>
<thead>
<tr>
<th>Age in years</th>
<th>Number of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>11-20</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>21-30</td>
<td>8</td>
<td>26</td>
</tr>
<tr>
<td>31-40</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>41-50</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>51-60</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>61-70</td>
<td>4</td>
<td>13</td>
</tr>
</tbody>
</table>

In this study, it was found that the majority (26%) of patients were aged between 21-30 years. 16% aged less than 10 years, 13% were aged 11-20 years. 13% between 31-40 years. 3% between 41-50 years. 16% between 0-10 years. 13% between 51-60 years. In this study, the mean age was 26.9 years; the youngest patient was 6 years of age and the oldest was 73 years old.

Table 2: Distribution by gender

<table>
<thead>
<tr>
<th>Sex</th>
<th>Number of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>18</td>
<td>60</td>
</tr>
<tr>
<td>Female</td>
<td>12</td>
<td>40</td>
</tr>
</tbody>
</table>

In the current study the male to female ratio is 1: 0.6
Table 3: Side of the ear affected

<table>
<thead>
<tr>
<th>Side of the ear</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right</td>
<td>14</td>
</tr>
<tr>
<td>Left</td>
<td>16</td>
</tr>
</tbody>
</table>

In this study left side (54%) is affected more than the right side (46%).

Table 4: SCUTUM AND EAC involvement in correlation with intraoperative findings

<table>
<thead>
<tr>
<th>Status</th>
<th>EAC Involvement</th>
<th>SCUTUM Erosion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HRCT Findings</td>
<td>INTRA OP Findings</td>
</tr>
<tr>
<td>Involved</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Normal</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

In the current study, it is found that external auditory canal involvement is detected by HRCT in 26 cases; the intraoperative findings show EAC involvement in 26 cases. The sensitivity and positive predictive value of HRCT in diagnosing EAC involvement is 100%. Specificity – 90% and negative predictive value is also 100% (For prevalence of 33%)

In the current study, it is found that Scutum erosion is detected by HRCT in 12 cases and 18 cases are found to have normal Scutum. The intraoperative findings show Scutum involvement is seen in 10 cases and 20 cases are found to have normal Scutum. The sensitivity of HRCT in diagnosing Scutum involvement is 96%, specificity is 80% with a positive predictive value of 96% (For prevalence of 83%). However, 2 cases (6%) show the false-positive result in HRCT.

Table 5: Ossicles erosion in correlation with intraoperative findings

<table>
<thead>
<tr>
<th>Ossicles erosion</th>
<th>HRCT findings</th>
<th>Intraoperative findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Mildly eroded</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Severely eroded</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

In the current study, Ossicular involvement is detected by CT and are categorized into mild and severe erosions based on number and parts of ossicles involved

In current HRCT study, 11 cases have normal ossicles, 10 cases have mild Ossicular erosions (with the sensitivity of 100% and positive predictive value of 100%) and 9 cases have severe Ossicular erosions. Intraoperatively it is found 12 cases have normal ossicles, 10 cases have mild erosion and 8 cases have severe erosions (with the sensitivity of 100% and positive predictive value of 100%), however, there is one false positive in detecting severe erosion.

Table 6: Dural plate erosion in correlation with intraoperative finding

<table>
<thead>
<tr>
<th>Dural Plate</th>
<th>HRCT Findings</th>
<th>INTRA OP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>27</td>
<td>26</td>
</tr>
<tr>
<td>Eroded</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

In the current study, it is found that for 30% prevalence, sensitivity is 99.4% and specificity is 100% with PPV of 100% and NPV of 99.9% HRCT detected dural plate involvement in 3 cases and 27 cases were found to be normal. Intraoperatively 4 cases had dural plate involvement and 26 cases were found to be normal.

Table 7: Tegmen tympani erosion in correlation with Intra op findings

<table>
<thead>
<tr>
<th>Tegmen Status</th>
<th>HRCT Findings</th>
<th>INTRA OP Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>24</td>
<td>25</td>
</tr>
<tr>
<td>Mildly eroded</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Completely eroded</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

In current study it is found that for prevalence of 17%, sensitivity is 100%, specificity is 96%, PPV is 83% and negative predictive value is 100%. HRCT detected tegmen involvement in six cases and 24 cases were found to be normal. Intraoperatively five cases had tegmen involvement and 25 cases were found to be normal. HRCT detects mild tegmen tympani involvement with 75% sensitivity. There is a 100% sensitivity of HRCT in detecting complete tegmen erosion.
Table 8: Facial nerve canal erosion and Lateral semi circular Canal status in correlation with intraoperative finding

<table>
<thead>
<tr>
<th>Facial canal</th>
<th>HRCT findings</th>
<th>Intraoperative findings</th>
<th>Lateral semicircular canal</th>
<th>HRCT finding</th>
<th>Intraoperative findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>25</td>
<td>25</td>
<td>Normal</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>Eroded</td>
<td>5</td>
<td>5</td>
<td>Eroded</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>30</td>
<td>Total</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

In current study it is found that for prevalence of 17%, the sensitivity is 100%, specificity is 100%, PPV is 100% and negative predictive value is 100%. HRCT detected facial canal involvement in 5 cases and 25 cases were found to be normal. Intraoperatively 5 cases had facial canal involvement and 25 cases were found to be normal. HRCT detects facial canal involvement with 100% sensitivity and with 100% positive predictive value.

In current study it is found that for prevalence of 6.7%, the sensitivity is 100%, specificity is 100%, PPV is 100% and negative predictive value is 100%. HRCT detected lateral semicircular canal involvement in 2 cases and 28 cases were found to be normal. Intraoperatively 2 cases had facial canal involvement and 28 cases were found to be normal. HRCT detects lateral semicircular canal involvement with 100% sensitivity and 100% positive predictive value.

Table 9: Mastoid status in correlation with intraoperative findings

<table>
<thead>
<tr>
<th>Mastoid Status</th>
<th>HRCT Finding</th>
<th>INTRA OP Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Soft tissue density lesion</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Sclerosed</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

In current study it is found that for prevalence of 90%, the sensitivity is 100%, specificity is 66.7%, PPV is 96% and negative predictive value is 100%.

HRCT detected 2 cases with normal mastoid air cells, 12 cases with soft tissue density lesion and 16 cases had sclerosed partially pneumatized mastoid air cells. Intraoperatively 3 cases were found to have normal mastoid, 13 cases with exudate infiltration in the mastoid and 14 cases were found to have partially pneumatized sclerosed mastoid.

Fig 1: a) Axial section showing soft tissue granulation tissue in epitympanum, mesotympanum and hypotympanum. b) Same findings seen in coronal section
Fig 2: Heterodense soft tissue lesion with in the tympanic cavity (mesotympanum, epitympanum) and mastoid antrum causing erosion of walls tympanic cavity, scutum, tegmen tympani, ossicles & mastoid antrum on right side

Discussion

In this study, a total number of 30 patients were selected randomly. The maximum number of patients were in the 21-30 age group (3rd decade of life) this is in consistence with Gerami et al (2009) [3] claims that average age of CSOM is 35.1 years. There is more variation in children. The gender radio was which is 1:0.6. More than 90 % patients belonged to low socioeconomic status. Lack of hygiene is one of the causes for CSOM. Left side (54 %) is affected more than the right side (46%). From the clinical data obtained from the Department of Otorhinolaryngology, 64 % of patients had AAD and the remaining 36 % had TTD. Mastoid was found to be well pneumatized (normal) in 9% cases, 43% cases had soft tissue density lesion in CT (suggestive active infection) and 48 % patients had sclerosed mastoid with improper pneumatization. In the case of Mastoid air cells, HRCT has 100% sensitivity and specificity was 66.7% which is similar to Gerami H et al (2009) [3]. HRCT is 100% sensitive and 66.7% specific in detecting soft tissue density lesions. However, HRCT is less sensitive in differentiating cholesteatoma from a granulation tissue for which MRI has a better diagnostic role. There is 100 % sensitivity in detecting cholesteatoma in Prussacs space, this is in consistence with Ranga Reddy Siliguri et al (2011) [4] but there is 90% specificity which is slightly higher than the study conducted by Ranga Reddy Siliguri et al (2011) [4]. Bony erosion is diagnosed by HRCT in the presence of cholesteatoma in 100% cases this is in consistence with Jacker et al (1984) [5] who found 98 % in their cases. HRCT detected ossicle erosion in all cases, there is usually some degree of subjective variation when reporting the grade of ossicular erosion, however, irrespectively of grading, cases reported to have any degree ossicular erosion had erosions intraoperatively. This is in consistence with Zhang X et al (2004) [6] and Chee NW et al (2001) [7]. In this study, there was facial canal involvement in 5 cases, with a sensitivity of intraoperatively of 100 % which is similar to the result obtained by Firas Q Alzoubi et al (2008) [8] and Chee NW et al (2001) [7]. RCT for Lateral semicircular canal involvement in 2 cases and 28 were found to have normal lateral semicircular canal with 100% sensitive and 100% specificity. Similar results were found by Firas Q Alzoubi et al. (2008) [8] and Gyanu et al [9]. HRCT was found to be fairly sensitive in detecting Tegmen erosion which agrees with results by Jackler RK (1984) [3] and Gerami H et al. (2009) [3]

Conclusion

HRCT has a very high reliability for diagnosis of erosion of scutum, erosion of ossicles and its disruption, Pneumatization of mastoid, anterior lying sigmoid, extent of cholesteatoma in the middle ear and MAC, It also helps in detecting presence of complications like mastoiditis, abscess, dehiscence of mastoid cortex, erosion of sigmoid plate, facial canal dehiscence, labyrinthine fistula and intracranial complications. COM can at times be life-threatening when it’s associated with intracranial complications that warrant the ENT surgeons to be familiar with standard approaches in surgeries. The use of HRCT and advances in radiological imaging had improved the study of the temporal bone in cases of CSOM in diagnosing the disease, knowing its extent and associations, anatomical and neurological structure involved. Therefore the study
concludes that HRCT can be recommended not just for symptomatic cases but in all suspected cases in knowing the extent of the disease thereby reducing the morbidity.

**Ethical Clearance:** Nil

**Source of Funding:** Meenakshi Academy of Higher Education and Research, Chennai, India

**Conflict of Interest:** Nil

**References**


Diffuse Neurofibroma of Face: A Rare Case Report

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Abstract

A case of a 17-year old male who presented with a chief complaint of unesthetic facial appearance due to malformed nose from the time of birth with a history of surgical correction for nasal deformity at the age of 11 years. Microscopy revealed a diagnosis of diffuse neurofibroma with areas showing nerve fibers with wavy nuclei.

Keywords: Unaesthetic face, diffuse neurofibroma, case report.

Introduction

Neurofibromas generally assume three growth patterns: localized, diffuse, or plexiform. Diffuse neurofibroma is not a common variant of neurofibroma, children and young adults being most commonly affected, head and neck being the common sites of involvement. Upon histological examination it appears similar to conventional neurofibromas except for a few unique features. We report a case of a 17-year old male who presented with a chief complaint of unesthetic facial appearance due to malformed nose from the time of birth this case is reported here because of its unique and rare nature.

Case Report: A 17-year-old boy presented with a chief complaint of unesthetic facial appearance with malformed nose from birth along with swelling of right cheek region. The malformation and swelling was initially small and has attained the current size in a gradual manner. Patient has congenital loss of eye which was treated when the patient was 10 years old. From birth the nose had three nostrils. History of surgical correction for nasal deformity at the age of 11 years but no record of previous surgery was available with patient. Post auricular cartilage was taken for nasal reconstruction.

On clinical examination bifid right nostril and presence of left eye prosthesis was seen. Diffuse swelling of right infraorbital region measuring upto 7 × 3 × 5 cm. Swelling was soft in consistency. Scar on right cheek and scar on the midline of nose was noticed (figure 1). The swelling involved only the skin and underlying bone appeared normal upon palpation. No café-au-lait macules, lisch nodules or freckles were seen anywhere in the body.

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Fig. 1: Diffuse swelling of right infra-orbital region, bifid right nostril and scar on right cheek and scar on the midline of nose.
No abnormalities were detected in OPG and CT except for nasal polyp. An incisional biopsy was planned and during surgery some cystic fluid or pus discharge from perialar region was observed. Provisional diagnosis of neurofibroma was given by the surgeon. The tissue submitted for biopsy was greyish yellow soft tissue specimen measuring about approximately (15x32x35) mm3 (figure 2). The tissue was grossed into three bits, each of the cut surface exhibited solid gray white areas intermixed with gelatinous areas (figure 3).

The microscopic examination revealed a soft tissue section showing loosely arranged fibrocollagenous tissue with areas showing nerve fibers with wavy nuclei and arranged in fasicles in varying sizes and shapes. These nerve fibers were also seen spread in between the muscle fibers in many areas(figure 4). Less cellular hyalized regions made up of thin, wispy and loosely arranged cells separated from each other with few microcystic spaces resembling areas known as Antoni B regions were seen (Figure5). Chronic inflammatory cell infiltrate consisting of lymphocytes, plasma cells and predominantly mast cells were seen with adipocytes and ecstatic vessels. A cystic space lined by epidermis made up of keratinized stratified squamous epithelium in varying thickness with numerous sebaceous glands and other skin adnexal structures like hair follicles and sweat glands were noticed (Figure 6).
Fig. 6H&E section under 4x view showing cystic space lined by epidermis made up of keratinized stratified squamous epithelium in varying thickness with numerous sebaceous glands and other skin adnexal structures

Discussion

A benign peripheral nerve sheath tumor arising from a mixture of Schwann cells and perineural fibroblasts is called neurofibroma. It can be present either as a solitary lesion or can be associated with neurofibromatosis. According to their growth pattern they can be classified into localized, diffuse, or plexiform.

Diffuse neurofibromas are not common but distinctive type of neurofibroma that is recognized as a separate entity from 1997. It mostly involves the skin and the subcutaneous tissues occurring primarily in 10th and 30th decade of life in either sex. They have a slight predilection for trunk, head and neck and the limbs and may become very large as seen in our case. More than 90% of diffuse neurofibromas are isolated lesions and about 10% are associated with neurofibromatosis type 1. Diffuse neurofibromas are poorly circumscribed non-encapsulated tumors and typically involve the subcutaneous tissue down to the level of the fascia. As seen in our case the diffuse variant is usually ill-defined and infiltrate the dermis and connective tissue sparing the skin appendages.

Except for nasal polyp there were no abnormalities seen in our case but generally diffuse neurofibromas erode through the skeletal structures and shows an intracranial extension. These bone deformities can be seen on OPG or computed tomography scans. The characteristic MR pattern of a diffuse neurofibroma is linear or reticular strands of intermediate signal intensity in the subcutaneous fat, which indicates infiltration of the tumor components of neurofibromatous tissue, interposed collagen, and ectatic vessels.

Although benign, these tumors are prone to significant neovascularisation. Troublesome hemorrhage often occurs during the excision of the neurofibromatous tissue which did not happen in the present case. Hypotensive anesthesia has proven to be effective in decreasing intraoperative bleeding. Because the vessels in tumor or skin lesions are abnormal, incisions must be made on normal skin if possible, which provides better bleeding control.

Histologically, it is characterized by a diffuse replacement of the dermis and subcutis by interlacing bundles of spindle-shaped cells with round or fusiform buckled nuclei and eosinophilic cytoplasm within a loose matrix of fine fibrillary collagen, such wavy nuclei of nerve fibers were seen in this case. Though it is infiltrative there is no destruction that will be evident in this histological type instead it envelopes the structures like skin adnexal structures, adipose tissue and muscle fibers. Meissner’s bodies are characteristic feature of diffuse neurofibroma but rarely they can be absent as reported in this case.

Surgical excision of the tumor is planned only when the functional need is compromised but complete removal is rarely achieved because of the extensive nature and multi centricity of the tumor. Radical surgery is reserved for instances of malignant transformations. However, malignant transformation rarely occurs in the diffuse neurofibroma.

Conclusion

Care must be given during examination and diagnosis of solitary diffuse neurofibroma. Depending on the site of involvement preoperative angiogram is preferred to avoid troublesome hemorrhage during excision. A yearly follow-up of the case is recommended as there is possibility of the potential development of neurofibromatosis and recurrence of the lesion though the malignant transformation is rare.

Ethical Clearance: NA

Source of Funding: Meenakshi Academy of Higher Education and Research, Chennai, India

Conflict of Interest: NA
References


Augmentation of Interdental Papilla with Advanced Platelet Rich Fibrin: A Case Report

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Abstract

Esthetics in dentistry is of great concern for dental professionals as well as patients for the maintenance of oral health. The key esthetic component is the black triangle which is the presence of lost interdental papilla between the maxillary anterior teeth. The most common problems associated with black’s triangle are phonetics, impaction of food and esthetic problems. Because of patient concern on esthetics, papilla reconstruction techniques is employed to regenerate the lost papillary tissues. Advanced platelet rich fibrin which are rich in platelets and growth factors allows predictable regeneration due to its advanced properties. This case report aims at evaluating the augmentation of interdental papilla along with A-Platelet rich fibrin.

Keywords: Esthetics, black’s triangle, interdental papilla, A-platelet rich fibrin.

Introduction

Dental Esthetics is a great concern for dental professionals and for the patients as well. The presence of interproximal papillae between the maxillary anterior teeth is the key component for an esthetic smile. Hence the loss of interdental papillae or tissues is known as the black triangle. Unaesthetic smile, phonetic problems and impaction of food are the most common difficulties associated with black’s triangle¹¹.

There are various treatment modalities for the reconstruction of the lost interdental papilla. Non-surgical treatment options comprise of repeated curettage, orthodontic treatment and restorative techniques for reconstructing the interdental papilla²³. Surgical techniques aim in the correction the lost interdental papilla which are the repeated interproximal curettage, free epithelialized gingival grafts, developmental of interproximal tissue in the buccal direction, and connective tissue graft⁴.

The various surgical procedures for papilla reconstruction techniques are technique sensitive because of the compromised vascular supply in the interdental space. The periodontal surgical procedures included Beagle’s pedicle graft procedure (Beagle, 1992), Han and Takei’s semilunar technique in 1996, Cortellini et al’s simplified papilla preservation flap (Cortellini, Prato, & Tonetti, 1995). The surgical procedures are successful when it is combined with or without regenerative materials. One among the most popular regenerative material used these days is the platelet concentrates. Advanced platelet rich fibrin when used as the regenerative material with its superior mechanical properties enhances periodontal regeneration in interdental papilla⁵. This shows the case report where A-Platelet rich fibrin was used to augment the interdental papilla inbetween 11 and 12 region.

Clinical Presentation: A systemically healthy 33 year old female patient reported to the Department of Periodontology with a chief complaint of unaesthetic smile in relation to the right upper front tooth region for the past two months. On intra-oral examination, an
isolated Norland’s class 2 interdental papilla loss was present in between 11 and 12 other clinical findings showed the healthy gingiva. The treatment was planned and a written informed consent was obtained from the patient.

Case Management: In the phase 1 therapy the scaling and root planning was done. Patient was reviewed after two weeks prior to the surgical procedure. [Fig 1].

A-PRF was prepared using the following protocol. 5ml of whole venous blood was collected in two sterile vacutainer tubes each and these tubes were centrifuged at 3000 revolutions per minute(rpm) for 10 minutes. Following this, the blood in the tubes settled into the three different layers: the lower-most fraction containing the red blood cells, the middle portion containing the fibrin clot and upper-most layer comprising of the acellular plasma fraction. Hence the platelet rich fibrin was procured by separating the middle layer from the centrifuged blood which was 2mm below the lower dividing line in the sterile tube and the A-PRF was ready to be placed on the surgical site. [Fig 2].

The defect sites was anesthetized using 2% lidocaine along with 1:100,000 epinephrine in relation to 11,12. A semilunar incision of 3-4mm was given with tunnel blade (0.2mm), 2mm coronal to the mucogingival junction and just above the papillary region and a crevicular incision was given over the teeth neighboring the defect and extending from the buccal aspect to the palatal aspect keeping the existing papilla intact and preserved. [Fig 3,4].

A Pouch was created at the apical aspect to the base of interdental papilla of 11 and 12. The preparation of A-PRF was done in accordance to the choukron’s protocol. A-PRF was trimmed to get the desired size and then tucked and placed beneath the recipient site with the help of 5-0 vicryl sutures. [Fig 5]
Periodontal dressing was placed over the surgical area. Patient was advised analgesics and antibiotics for 5 days along with 0.12% chlorhexidine digluconate two times a day for 2 weeks along with other post operation instructions.

The patient was asked to report after 24hrs and assessed for any post operative complications or discomfort. After 2 weeks the patient was recalled, the periodontal dressing was removed and healing was assessed at 3 and 6 months period post-operatively. After 6 months, post-operative photograph has been taken where the patient was satisfied for that esthetic outcome. [Fig 6].

Discussion

Loss of Interdental papilla is one of the troubling dilemmas in dentistry, posing the patients to functional, phonetic and esthetic problems. Various surgical and non-surgical techniques are proposed for the augmentation of the lost interdental papilla. But most of the surgical procedures fail to achieve long term stability because of the minor blood supply to the interdental papilla[6].

Both surgical and non-surgical treatment modalities are used to reconstruct the lost interdental papilla. Surgical techniques aim in the correction the lost interdental papilla which are the repeated interproximal curettage, free epithelialized gingival grafts, developmental of interproximal tissue in the buccal direction, and connective tissue graft[7].

In this study, A-PRF was used for the augmentation of the lost interdental papilla. A-PRF contains growth factors intracellularly which comprises of platelet-derived growth factors, transforming growth factor beta and insulin like growth factor-1[5]. All these factors release slowly from the fibrin matrix and aid in the healing of the surgical site. A-PRF along with other alloplastic materials like putty alloplastic material are used as new innovative minimally invasive method for management of intrabony defects with no post-operative complications that arises with conventional flap surgery. A-PRF has an advantage over connective tissue graft which is easy to procure, better healing of surgical site, no second surgical site required and is less expensive[8].

Thus stable results are achieved with this technique along with A-PRF in our study. There was a complete reconstruction of papilla at 3 months and 6 months and the results were achieved.

The interdental papilla is scalloped and delicate. There is limited access to the interdental papilla, microsurgical instruments and surgical magnification benefits the surgeon by increasing visibility, facilitating access to the interdental papilla and eliminating unnecessary releasing incisions. Use of microsurgical instrumentation allowed the surgeon to elevate the flap atraumatically and avoiding vertical incisions, thus maintaining the blood supply to the surgical area[9,10].

Conclusion

Loss of interdental papilla its augmentation using A-PRF was completely achieved when reviewed at 3 and 6 months postoperatively. Thus the use of A-PRF gives a predictable and successful result in the reconstruction of the lost interdental papilla. The A-PRF membrane placement in the present case report seems to be effective, innovative, and more predictable method in treating isolated lost interdental papilla.
References


Dengue Fever among Rural Population

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Abstract

Background: Dengue fever is a viral illness commonly caused by Flavivirus. Dengue becomes the most common public health issue in India because the incidence of dengue fever is high all over the world. In Tamil Nadu, the existence of all the four serotypes of the dengue virus was proved during the several outbreaks of dengue fever earlier and the reported seasonal changes especially Rainfall influencing the several crucial issues of people.

Objectives: Assess the knowledge regarding dengue fever, and associate the level of knowledge with selected demographic variables.

Method: A quantitative approach and a descriptive research design for 100 samples by non-probability convenient sampling technique were used. Results: The results revealed that 10.0% of people were with inadequate knowledge of dengue fever, 58.0% of people have moderately adequate knowledge, and 32.0% of people had adequate knowledge.

Conclusion: Only a moderate level of people has adequate knowledge about dengue fever and seeks prevention.

Keywords: Assess, Knowledge, Dengue Fever, Rural Population.

Introduction

Dengue is caused by a flavivirus, It can be affected by the infected mosquito bites of anyone. Dengue is spread by a female mosquito is called Aedes aegypti which bites during the early morning and evening before dusk. It is more common in wet and warm areas.

Dengue cases increase during the beginning of the rainy season, the common symptoms of dengue is high fever, headache, joint pain, muscle pain, vomiting, and rash, most people with dengue recover within two weeks or sometimes progresses into dengue hemorrhagic fever. Dengue is the most life-threatening condition in the pediatric population and is highly susceptible to complications and deterioration. The fever can occur rapidly and the ability to recognize early warning signs is crucial. Approximately, 50-100 million people are affected by dengue worldwide annually, 1000-20000 people died annually because of dengue.[6,7]

Dengue hemorrhagic fever it’s a serious condition that will cause severe bleeding and a person will be going into the stage of Hypovolemic shock. Commonly infants, pregnant women, and older adults are at risk of developing Dengue hemorrhagic fever[1].

Nevertheless, health is a fundamental human right of all mankind. All over the world, health care settings are striving to expand their health care service to overcome the continuous threat from the emergence and resurgence of vector burn disease[2].

In America, 1, 346,991 dengue cases have been reported between the year January 2019 to March
2020 and 1,530 peoples died in the same year. In India, 69,393 cases were reported in the year 2019 — 2020, and 124 deaths. Finally, in Tamil Nadu, 2,951 patients who had dengue fever have been treated. From this year beginning the number of dengue cases was reported in the highest numbers in Chennai, 3,034 people in Tamil Nadu has been tested positive for dengue of which the highest incidence of 543 cases was reported by Chennai till October 8th, 2019. [3,4]

Among the vector-borne disease, dengue is the major public issue in Tamil Nadu because nowadays cases are slightly increasing. Health care workers are also feeling difficulty in finding the cases during this COVID 19 crisis with symptoms as the cases are overlapping and there is a high risk of the wrong diagnosis. The main aim of the study is to assess the knowledge regarding dengue fever among rural people and their ability in recognizing life-threatening signs and symptoms of dengue [5].

**Methodology**

The quantitative approach was adopted for the study. A descriptive research design was adopted for the study; The study was conducted at Villapakkam among the rural population with 100 samples who fulfilled the inclusion criteria. The study adopted a convenient sampling technique. The demographic variable and modified self-structured tool were used to collect the data for the study. Getting permission and informed consent was obtained. Data were collected, organized, analyzed, and tabulated by descriptive and inferential statistics.

**Results**

The study findings show that the percentage of the knowledge level of dengue fever among 10% of people was inadequate knowledge, 58.0% were the moderately adequate level of knowledge and 32% of them were having an adequate level of knowledge about dengue fever.

<table>
<thead>
<tr>
<th>Level of knowledge</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate knowledge</td>
<td>10</td>
<td>10.0%</td>
</tr>
<tr>
<td>Moderately Adequate knowledge</td>
<td>58</td>
<td>58.0%</td>
</tr>
<tr>
<td>Adequate knowledge</td>
<td>32</td>
<td>32.0%</td>
</tr>
</tbody>
</table>

The analysis depicted that rural people are having more knowledge scores regarding dengue fever (95.0%) and a minimum score of 11.0% regarding the drugs used to avoid dengue fever. In the association between the level of knowledge score and people with demographic variables, younger males are more knowledgeable scores than the other groups which were statistically significant calculated using the chi-square test. (P=41.0f).
Further, in the association between the level of knowledge score and educational status, it is found that 26.5% of the rural people with high school education have good knowledge, and 64.4% of the rural people hailing from nuclear family has average knowledge regarding dengue fever which was statistically significant. (P=0.05).

**Discussion**

Based on the objectives of the research, the dengue fever knowledge among the rural populations in the community is discussed objective wise. The first objective was to assess the knowledge regarding dengue fever, the result revealed that their knowledge score about dengue fever is good (95.5%) and the minimum
score regarding avoidance of drugs during dengue fever (11.0%). The second objective was to associate the level of knowledge with selected demographic variables, reveals the association between the level of knowledge score and the demographic variables. The younger age groups are having more knowledge (45.9%) and joint family people are having more knowledge scores (41.1%) than others, whereas, 64.4% of the rural people hailing from nuclear families have average knowledge regarding dengue fever which was statistically significant. Age group more than 60 are having poor knowledge. Dengue is a major health burden in India. Annually the number of dengue cases is increasing.

The Government has taken some steps to overcome the COVID 19 crisis. The seasonal epidemic of dengue is started now in Chennai and in some of the areas, there are complaints of the mosquito menace escalating. Therefore, the city corporation has transferred all domestic breeding checkers from COVID 19 duty to vector control work and conducting the fever camps. The government also is creating awareness and taking steps to control breeding. The health care professionals also playing a vital role in taking some precautionary measures to control the spread of dengue making sure that water stagnation is not allowed anywhere.

Emmanuelle Kumaran (2018) conducted a study to assess the knowledge, attitude, and behavior of dengue fever among the rural people in the selected community area the study revealed that the knowledge on dengue fever symptoms, transmission, and prevention method was high. (96.7%) of people were able to identify mosquitoes as being the dengue vector. Most of the people were able to identify the biting time of dengue mosquito’s, although, 17.8% of participants were having knowledge on dengue causing mosquitoes to bite the person at night time. (95.5%) of peoples were have adequate knowledge about least breeding sites of dengue mosquito.

**Conclusion**

Dengue fever is a disease that can take a toll on people if they are not educated. This study has proved that rural people need to be educated to prevent dengue. Serious steps have to be taken by the Government on taking preventive measures programs in the rural areas as the major it y of the population of India is in the rural areas.

**Acknowledgments:** I would like to express my sincere thanks to Panchayat Officer, Villapakkam Village for Granting permission and arranging the facilities to carry out this research. I would also like to extend my heartfelt thanks to our samples for their active participation and cooperation in data collection.

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**Conflict of Interest:** Nil

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Conjoined Twin: Review with a Case Report

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Abstract

Conjoined twins are suggested to result from aberrant embryogenesis. The two main theories proposed to explain the phenomena are fission and fusion. The incidence rate is 1 in 50,000 births; however, since about 60% of the cases are stillborn, the true incidence is approximated at 1 in 200,000. There is a higher predisposition towards female than male gender with a ratio of 3:1. Conjoined twins are classified based upon the site of attachment. The extent of organ sharing, especially the heart, determines the possibility and prognosis of a separation procedure. Meticulous preoperative evaluation, planning, and preparedness of the team are crucial for a successful separation. Separation of conjoined twins poses several technical, legal, and ethical issues. With the aid of diagnostic imaging techniques, such as ultrasonography (US) and three-dimensional magnetic resonance imaging (3D-MRI), physicians are able to make prenatal diagnoses.

Keywords: Conjoined twins, cephalopagus, Monozygotic, Prenatal diagnosis, Surgical separation

Introduction

This is a 22 years PRIMIGRAVIDA with four months of amenorrhea attended Gynaecology OPD of city hospital, Cuttack for her routine pregnancy check up. She was married for last 6 months and was only taking folic acid after her urine examination revealed beta grav index positive. No history of taking any other medicines. Family history was not suggestive of any multiple pregnancy. On General examination all parameters were normal. All systemic examination was also normal. Obstetric examination revealed 16 weeks size Uterus with external ballotment positive. She was advised to do all blood investigations and USG to confirm the period of gestation as well as to rule out any congenital anomaly1,2.

USG Report Revealed: Conjoined twin with one head (cephalopagus), two bodies joined anteriorly with two pairs of upper limbs and two pairs of lower limbs and single placenta.

Patient was explained fully about the prognosis. She wanted termination of pregnancy. She was admitted to the City Hospital O&G ward and termination was done with Misoprostol (200mg), 2 tabs 6 hourly3.

Discussion

Conjoined twins are identical twins joined in utero. An extremely rare phenomenon, the occurrence is estimated to range from 1 in 49,000 births to 1 in 189,000 births, with a somewhat higher incidence in Southeast Asia, Africa and Brazil. Approximately half are stillborn, and an additional one-third die within 24 hours. Most live births are female, with a ratio of 3:1. Most stillborns are male4,5.

Two contradicting theories exist to explain the origins of conjoined twins. The more generally accepted theory is FISSION, in which the fertilized egg splits partially. The other theory, no longer believed to be the basis of conjoined twinning, is FUSION, in which a fertilized egg completely separates, but stem cells (which search for similar cells) find like-stem cells on the other twin and fuse the twins together. Conjoined twins share a single common chorion, placenta, and amniotic sac, although these characteristics are not exclusive to conjoined twins as there are some monozygotic but non-conjoined twins that also share these structures in utero6,7.

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Types of conjoined twins: Conjoined twins are typically classified by the point at which their bodies are joined. The most common types of conjoined twins are:

- **Thoraco-omphalopagus** (28% of cases): Two bodies fused from the upper chest to the lower chest. These twins usually share a heart, and may also share the liver or part of the digestive system.

- **Thoracopagus** (18.5%): Two bodies fused from the upper thorax to lower belly. The heart is always involved in these cases. As of 2015, separation of a genuinely shared heart has not offered survival to two twins; a designated twin may survive if allotted the heart, sacrificing the other twin.

- **Omphalopagus** (10%): Two bodies fused at the lower abdomen. Unlike thoracopagus, the heart is never involved in these cases; however, the twins often share a liver, digestive system, diaphragm and other organs.

- **Parasitic twins** (10%): Twins that are asymmetrically conjoined, resulting in one twin that is small, less formed, and dependent on the larger twin for survival.

- **Craniopagus** (6%): Fused skulls, but separate bodies. These twins can be conjoined at the back of the head, the front of the head, or the side of the head, but not on the face or the base of the skull.

Other less-common types of conjoined twins include:

**Picture 1: Foetus and the placenta.**
• **Cephalopagus**: Two faces on opposite sides of a single, conjoined head; the upper portion of the body is fused while the bottom portions are separate. These twins generally cannot survive due to severe malformations of the brain. Also known as janiceps (after the two-faced god Janus) or syncephalus.

• **Syncephalus**: One head with a single face but four ears, and two bodies.

• **Cephalothoracopagus**: Bodies fused in the head and thorax. In this type of twins, there are two faces facing in opposite directions, or sometimes a single face and an enlarged skull.

• **Xiphopagus**: Two bodies fused in the xiphoid cartilage, which is approximately from the navel to the lower breastbone. These twins almost never share any vital organs, with the exception of the liver. A famous example is Chang and Eng Bunker.

• **Ischiopagus**: Fused lower half of the two bodies, with spines conjoined end-to-end at a 180° angle. These twins have four arms; two, three or four legs; and typically one external set of genitalia and anus.

![Picture 2: Types of Conjunctions](image)
**Picture 3: Siamese Twins**

- **Omphalo-Ischiopagus**: Fused in a similar fashion as ischiopagus twins, but facing each other with a joined abdomen akin to omphalopagus. These twins have four arms, and two, three, or four legs.

- **Parapagus**: Fused side-by-side with a shared pelvis. Twins that are **dithoracic parapagus** are fused at the abdomen and pelvis, but not the thorax. Twins that are **diprosopic parapagus** have one trunk and two faces. Twins that are **diecephalic parapagus** have one trunk and two heads, and have two (dibrachius), three (tribrachius), or four (tetrabrachius) arms.

- **Craniopagus parasiticus**: Like craniopagus, but with a second bodiless head attached to the dominant head.

- **Pygopagus (Iliopagus)**: Two bodies joined at the pelvis.

- **Rachipagus**: Twins joined along the dorsal aspect (back) of their bodies, with fusion of the vertebral arches and the soft tissue from the head to the buttocks.

The most famous pair of conjoined twins was Chang and Eng Bunker (1811–1874), Thai brothers born in Siam, now Thailand. They travelled with P.T. Barnum’s circus for many years and were labeled as the **Siamese Twins**. Chang and Eng were joined by a band of flesh, cartilage, and their fused livers at the torso. In modern times, they could have been easily separated. Due to the brothers’ fame and the rarity of the condition, the term “Siamese twins” came to be used as a synonym for conjoined twins.

### Conclusion

Conjoined twins arise from abnormal embryogenesis. There have been many well-observed cases of conjoined twins throughout history, as well as attempts of separation. While separation is normally opted for, there have also been many examples of unseparated conjoined twins leading fulfilling lives. Conjoined twins are classified based on the attachment site. This, as well as the extent of attachment, determines their prognosis. Due to the near infinite variations in conjoined twins, the outcome is highly case-specific. Prenatal diagnosis is possible using ultrasound, MRI, and CT, and can be performed as early as 12 weeks of gestation. Due to the presence of several congenital anomalies associated with conjoined twins, preoperative, intraoperative, and postoperative management is essential to improve prognosis. Cardiovascular and respiratory failures are the two major risk factors for death of the twins postseparation. There are many ethical challenges associated with treating conjoined twins, such as difficult decisions regarding early termination and determining the individuality of each twin.

**Ethical Permission:** Obtained

**Conflict of Interests:** None

**Funding:** None

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Cesarean Section in Low Birth Weight Babies: An Original Research

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Abstract
The high prevalence of high-risk pregnancies, which can lead to premature delivery, contributes to an increase in the rates of preterm and low-birth weight (LBW) infants, with an increase in the number of cesarean deliveries. This study was done to access maternal variables and their associations with cesarean deliveries of LBW newborns. A retrospective study was conducted by reviewing the medical records of pregnant women who underwent cesarean sections for the delivery of LBW infants (weight, ≥1500 and 35 weeks at delivery, and 50.8% attended less than eight prenatal consultations. Hypertensive syndrome (23.8%) was the main indication for cesarean delivery. Among the newborns, 58.3% had an Apgar score of 7 in the first minute of life, 79.3% had a score of 9 in the fifth minute of life, and 54.3% were females. Conclusions: Several maternal variables such as primiparity, education level, number of prenatal consultations, and presence of maternal hypertensive syndrome had a statistically significant association with the occurrence of cesarean sections for the delivery of LBW infants.

Keywords: High-Risk Pregnancy; Cesarean Section; Low-Birth Weight Newborns; Prenatal Care; Gestational Age; Hypertensive Syndrome.

Introduction
In a developing country like ours the increased incidence of low birth weight babies either due to preterm delivery or IUGR is a major problem so far as perinatal outcome is concerned. The proven contention over the last few years that rise in the rate of caesarean section has dramatically reduced the perinatal mortality and morbidity to a significant extent. Though it is difficult to prove the causal relationship between these two events, the consensus of opinion about recognition of the foetus in utero as a second patient and its right for survival beginning from the time of fertilisation has revolutionized the approach for the appropriate mode of termination when one considers quality maternity and child health services in the present day obstetric practice. Though birth weight is one of the most important considerations regarding the mode of delivery, in broader perspective, the Obstetrician encounters two main Intricate aspects while encountering cases of low birth weight; preterm and growth retarded. Apart from the fact that Improved neonatal care in the present era has revolutionized the management of these groups. Regarding birth weight, the World Health Organization (WHO) defines NBs with low birth weight (LBW) as those with birth weight of <2500g and ≥1500g, regardless of gestational age (GA). Birth weight is the factor that most influences infant survival, and because it represents only one final measurement, anticipating its diagnosis can contribute to decreased morbidity and mortality.

In these High risk pregnancies, still the decision of the gynecologist in regards to the mode of delivery is of vital concern which affects the perinatal outcome to a great extent. Epidemiological studies revealed that LBW is a risk factor for increased neonatal morbidity and mortality and for the later development of obesity, diabetes mellitus, and particularly cardiovascular illnesses.
On the other hand, the management of growth retarded babies in utero is also very delicate as the correct formulation of the route of delivery is an essential prerequisite for subsequent intensive care reflecting in increase in both short term and long term survival. Viewed in these controversial contexts in mind this piece of work has been undertaken in the department of Obstetrics and Gynaecology where various perinatal factors in the low birth weight babies delivered by caesarean section are correlated with a control group of low birth weight babies born via natural is in order to find out the positive value of mode of delivery to an optimum perinatal outcome.

The present study was carried out in the Department of Obstetrics and Gynaecology of S.C.,B. Medical College, Cuttack in Pregnant mothers having low birth weight babies (weighing less than 2500g) were scrutinized from amongst antenatal diagnosis. A sum total of two hundred cases of pregnancies having low birth weight babies undergoing caesarean section served as study series where as hundred cases, having low birth weight babies delivering vaginally which were selected at random, taken as control group. Exclusion criteria in our study include Multifoetal pregnancy and Intra uterine deaths. A detailed history of the patients with special reference to age, parity, socio-economic status, present obstetric and medical complications were taken. An effort was made to ascertain the gestational age with accuracy as far as possible. Thorough intrapartum events were looked into and a meticulous search was made as regards the neonatal outcome with reference to details of morbidity as well as mortality pattern; so as to have a positive correlation with the study as well as control group in order to find out the role of caesarean section in low birth weight babies.

This study was made on the role of caesarean section in 200 cases of low birth weight babies and were compared to 100 vaginal deliveries as control in closely matched birth aspects.

**Results**

The following Observations were made on various weights of cases and controls.

Highest number of low birth weight caesarean sections has occurred in 21-25 years age group. In vaginal delivery cases it was also highest (51%). Highest number of low birth weight deliveries is in low socio-economic status (68% in both). We have taken monthly income of less than Rs.1000.00 as low, Rs.1000-3000/- as middle and more than Rs. 3000.00 per month as upper socio-economic group. 61% of low birth weight caesarean cases were unbooked compared to 47% of low birth weight vaginal deliveries. Conversely only 39% of study were booked compared to 53% of controls.

Both in study and control series highest number of low birth weight deliveries took place in primi (49.5% and 50% respectively). Highest number of deliveries took place in the gestational age group of 37-38 weeks both in study and control series (33% and 28% respectively) followed closely by the gestational age of 35-36 weeks. In the gestational age of 29-34 weeks 19% and 21% deliveries took places in each group respectively (14 in 29-30 weeks 3.5% in 31-32 weeks and 14.5% in 33-34 weeks gestational in study group and 3%, 4% and 14% in control group respectively).

This study shows relevant maternal complications during Pregnancy in both groups. Maternal complications were not detected in 77.5% case in caesarean group and 71% in vaginal delivery group. Pregnancy induced hypertension contributed to 10.5% and 12% respectively in study and control group and antepartum haemorrhage was found in 7% and 8% respectively. Among the maternal indications placenta praevia topped the list (16.5%) with premature rupture of membrane (14.5%), PET/Eclampsia (10.5%) following it. Among foetal indications foetal distress (27%) was the commonest followed by IUGR (3.5%) and breech’ presentation (13%) of cases.

In many cases operation has been done for more than one indication. 79% had spountaneous onset of labour where as 21% cases were induced. 29 cases had normal deliveries, 41 cases had episiotomy. Forceps was applied in 22 cases and 8 cases had Assisted breech delivery. This study shows distribution of cases in different birth weight group of newborn infants. In study group highest number of infants (48.5%) were delivered with birth-weight of 2000-2249 grams. Similarly in vaginal delivery group 37(37%) infants were in same birth weight group. In the study group 50% of infants had no morbidity. In the rest Asphyxia was found in 43% and hypothermia in 31.5% of infants. In the vaginal delivery group 35.3% of babies had no morbidity while 43.7% suffered from asphyxia and 31.7% from hypothermia.
Discussion

The present study comprised of two hundred cases of low birth weight babies delivered by caesarean section while one hundred cases of low birth weight babies born via naturalis served as control.

The cases were selected from amongst the emergency and booked admissions to the department. We excluded the cases having multifetal pregnancy and intrauterine foetal death. Relevant history noted and thorough examination done. Nature of deliveries were studied in these low birth weight cases. On delivery the babies were resuscitated and Apgar score at birth & after 5 minutes were noted. The neonatal mortality and morbidity pattern compared.

Out of a sum total of 918 caesarean sections during the study period there were 200 cases of low birth weight babies, the incidence being 21.8% (Hospital data), the figure close to that reported by Rege et al (1987) (27%).

Analysis of age distribution of cases both in the study as well as control series (Table-I) closely demonstrates an almost similar percentage of cases in each age group, where maximum number of cases are observed between the age range 21-25 years (50% and 51% in study and control respectively). This is a justifiable fact because second and third decade of life is the period of maximum reproductive potential and hence present to the institution more commonly for their confinements. The frequency of occurrence of low birth weight babies is commonly encountered amongst patients belonging to low socio-economic status3-5.

Distribution of cases according to gestational age as reported by Jayant et al (1987) however revealed 31.8% in 37-38 weeks, 26.4% in 39-40 weeks and 19.7% in 35-36 weeks. The association of relevant maternal complication in our series in the form of pregnancy induced hypertension, Antepartum haemorrhage, Diabetes mellitus, cardiac disease and anemia. Our observation closely tallies with esslein et al (1979) who reported a wide ranging associated with Preterm labour (19.1%), PROM (38.1%) mia (19.1%), Abruptio placentae (7.1%) and placental gestation (7.1%)6.7.

The nature of caesarean section in study group reveals relatively small percent of cases where elective caesarean section has been contemplated (8%) in contrast to emergency caesarean. Our finding did not corroborate with those of Pinion in 92% of cases. The different indications for caesarean section in which majority of cases required intervention because of foetal distress (28%). However section was performed in 16.5% for placenta praevia, 10.5% for preeclampsia/eclampsia, 14.5% for PROM 12.5% for breech and 13.5% for IUGR.

Pinion et al in contrast recorded that caesarean section done in 6.5% of cases for foetal distress which shows a significantly reduced figure in comparision to our series. The other indications of their series in nearly similar to that of ours. This could be because of the fact that more number of cases of our series probably had intrauterine growth retardation in contrast to a preponderance of preterm caesarean section in Pinion’s series8.9.

In a study of 91 cases by Jayant et al (1987) the common maternal indication for low birth weight caesarean section were feto-pelvic disproportion 11(12%) cases, previous caesarean section 11 (12%) cases, pre-eclampsia/eclampsia 10 (10.9%) cases, mechanical dystocia 7 (7.6%) cases. Amongst foetal indications, foetal distress accounted for 20.8% of cases, other malpresentations 7.6%, and breech 5.4% of cases. Indications of above series correlates to our study.

Haesslein et al (1979) in a study of 30 cases found that the indication of low birth weight caesarean section was mostly due to breech presentation (36.3%) and pregnancy induced hypertension(33.3%).

In the study by Barret et al (1983) breech (45.6%) severe PET (21.7%), foetal distress (10.8%) and IUGR (8.6%) were the common indications for low birth weight caesarean section. Indications of operations in our study do not correlate to that of Haesslein et al and Barret et al as their studies are mainly on lower birth weight groups than those of ours. In study group, 48.5% had a birth weight of 2000-2249g where as in the same range 37% were found in the control series. In birth weight below 1500g, 3.5% of cases were observed in study in contrast to 74 in control group. The distribution pattern in relation to birth weight follows an almost similar pattern in both the study and control series, the findings being compatible to those of Jayant et al (1987) and Pinion et al (1988).

Correlation of birth weight with gestational age reveals that in birth weight group more than 2000g majority of cases are encountered at a gestational age beyond 35 weeks both the study as well as control group.
Below the gestational age of 30 weeks, 2 cases are seen in the weight range of 1000-1499g while not a single case was recorded in the study group in the same weight group. Out of the cases delivered by caesarean section on babies weighing between 1000-1499g majority (42.8%) are encountered in 31-32 weeks range.

Rege et al (1987) observed in their series that the highest section rate in 1000-2000g weight group was at 37-38 weeks of gestation indicating the preponderance of growth retardation. Overall section rate before 37 weeks were 12% in Pinion et al (1988) and 21.7% in Kafka et al (1969) series.

From our study it could be inferred that the low birth weight babies are in a compromised state at birth and hence an optimum level of neonatal resuscitative measure is mandatory both in the study and control series10.

Our study shows the neonatal morbidity pattern in both study and control group, which reveals that the overall neonatal morbidity is significantly more (64.7%) amongst babies born vaginally in comparison to a morbidity figure of 50% in study series. This shows a probable relationship between morbidity and route of delivery. Asphyxia by far accounted for maximum number of cases both in study and control series (434 and 43.7%).

Analysing The morbidities in different weight groups, it is evident that in 1000-1499g birth weight group all the babies (both groups) had neonatal complications. But the caesarean babies had fared better than the control group percentage wise. 71.4% and 87.5% in study and control series respectively11.

Asphyxia remained as the dominant factor i.e. In 1500-1999gm weight group the caesarean babies had less perinatal sufferings than the control group (percentagewise), majority being attributed to asphyxia (70%, vs 93.7%). In higher birth weight groups of 2000-2249g and 2250-2499g the neonatal morbidities were found in similar proportions in both series. Asphyxia remained as the main complication but the percentage dropped down as birth weight improved (42.2% and 21.2% in study and 48.6% and 21.8% in control groups). Our observation closely corroborates to those of Pinion et al (1988), Rege et al (1987), Haesslein et al (1979) and Shennan et al (1980)12.

**Conclusion**

As regards perinatal mortality in our series it is evident that the overall perinatal mortality is significantly higher in cases born by vaginal route in contrast to those where section has been contemplated (19% and 14.5%). Another important point of concern is that about 36.8% of cases had fresh still birth in comparision to 63.2% of cases having neonatal deaths amongst vaginally delivered babies.

**Ethical Permission:** Obtained

**Conflict of Interests:** None

**Funding:** None

**References**


Why Mothers Die: An Original Research in Odisha

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Abstract

Maternal mortality is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. Each year in India, roughly 28 million women experience pregnancy and 26 million have a live birth. Of these, an estimated 67,000 maternal deaths and one million newborn deaths occur each year. In addition, millions more women and newborns suffer pregnancy and birth related ill-health. Thus, pregnancy-related mortality and morbidity continues to have a huge impact on the lives of Indian women and their newborns.

Keywords: Maternal mortality ratio, epidemiology, maternal complications.

Introduction

High maternal mortality is a major concern in India, especially in the northern Indian states. The maternal mortality ratio (MMR) is as high as 400 per 100,000 live births in India. The state of Uttar Pradesh, which has the largest population in the country, has the highest MMR at 599 per 100,000 and Rajasthan has the second highest maternal mortality rate at 670 per 100,000 live births. The main medical causes of maternal deaths are hemorrhage, severe anemia, obstructed labor, puerperal sepsis, and others. These preventable causes of mortality are well known and manageable through simple interventions with appropriate clinical and obstetric care. Notwithstanding the knowledge of causes and availability of technology needed to avert maternal deaths, the maternal mortality rate has remained unacceptably high. There has been a secular decline in IMR and CMR until 1996 and thereafter stagnation in IMR. The decline in IMR was on account of the decline in post neo-natal mortality. The future decline is anticipated due to decline in neonatal mortality. The neonatal mortality is primarily consequences of endogenous factors, which are largely governed by the maternal causes and thereby call for the monitoring of maternal mortality ratio in the population. The results of large-scale survey have however shown that there was no decline in MMR over time indicating an urgent public health concern¹,².

In the Third World, every time a woman becomes pregnant, her risk of dying is 200 times greater than the risk run by a woman in the developed world. About 15% of all pregnant women experience complications that can be detected and appropriately managed given proper clinical care. Various reports and surveys have shown that MMR has not declined in India (ICMR, 2003). However, estimates of MMR are not reliable owing to methodologic complexities involved in the community based surveys. The complications of pregnancies and the births are found to be the leading causes of deaths and disability among women of reproductive age. The health problems of mothers and newborns arise as a result of synergistic effects of malnutrition, poverty, illiteracy, unhygienic living conditions, infections and unregulated fertility. Maternal mortality is called direct when it is a complication of the pregnancy, delivery or their management. It is called Indirect when there is a Pregnancy related death in a patient with a pre-existing or newly developed health problem. Maternal Mortality Rate is used as the measure of the quality of a health care system in a community. It is no. of maternal deaths per 100,000 live birth. In India Maternal Mortality Rate was 174 (2011-15) whereas in Odisha it is 222 (2011-2015)³,⁴.

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Causes of Death as Per WHO:

Maternal mortality can be attributed to various factors such as: Haemorrhage (26%), Infection(13%), Unsafe abortion (13%), Eclampsia(12%), Obstructed labour (8%), Other direct causes (8%), Indirect causes like Malaria, Anaemia, HIV/AIDS, cardiovascular disease (20%). More than 90% of maternal death occurs in developing countries whereas 45% of post partum death occurs within 24 hours.

Methodology

It is a retrospective study of maternal death from year 2011 to 2016 from the available data in the Cuttack district. Cuttack district -14 block level hospitals. Two Sub-divisional hospital (Banki & Athagarh). 5 FRUs. One Secondary level hospital(DHH). One Tertiary care hospital ( SCB MCH). Total no of Deliveries in five years were 277051 out of which 276106 were live birth. Total Delivery includes deliveries from different districts of the state those who have delivered in cuttack district. It also includes deliveries in Private Institutions and nurshing homes (Table 1).

Table 1: Total no of Deliveries in five years

<table>
<thead>
<tr>
<th>Year</th>
<th>Delivery</th>
<th>Live birth</th>
<th>Deaths in Cuttack</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-12</td>
<td>50540</td>
<td>50142</td>
<td>30</td>
</tr>
<tr>
<td>2012-13</td>
<td>54230</td>
<td>54181</td>
<td>24</td>
</tr>
<tr>
<td>2013-14</td>
<td>54230</td>
<td>54181</td>
<td>21</td>
</tr>
<tr>
<td>2014-15</td>
<td>58027</td>
<td>57848</td>
<td>32</td>
</tr>
<tr>
<td>2015-16</td>
<td>55422</td>
<td>55417</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>277051</td>
<td>276106</td>
<td>133</td>
</tr>
</tbody>
</table>

Maximum no of death occurred in the age group of 20-29 yrs. The analysis of the medical causes of deaths revealed that hemorrhage was responsible for the highest toll. Hemorrhage maximum maternal mortality followed by eclampsia, pregnancy induced hyper tension and other factors. postpartum hemorrhage alone accounted for one fourth of the total maternal deaths. Out of total death Haemorrage accounts for 30%, Sepsis 8%, Eclampsia 11.2%, PIH 9.7%, Pulmonary Embolism 5.2%, Ruptured Uterus 2.2%, Sepsis 0.75%, HELPP Syndrome 2.2%, Ut.Inversion 0.75%, Ectopic pregnancy 0.75% (Table 2).

Table 2: Primary cause of Maternal death

<table>
<thead>
<tr>
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<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Haemorrhage (APH &amp; PPH)</td>
<td>7</td>
<td>4</td>
<td>8</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Eclampsia</td>
<td>4</td>
<td>7</td>
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<td>3</td>
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<tr>
<td>Heart Disease &amp; CCF</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>5</td>
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<tr>
<td>Amniotic fluid embolism</td>
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<td>3</td>
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<tr>
<td>Chronic Renal Problem (Helpp Syndrome)</td>
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<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Ruptured Uterus</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Anesthetic complications</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Hepatobiliary disease</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>TB/Diabetes/Others</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

Discussion

Maternal deaths are a significant cause of death in women in the 15–49 years age group, and they make up a larger proportion of all-cause deaths in the rural areas of poorer states, compared to other regions of India. We found that the distribution of cause specific mortality was the same across poorer and richer states, suggesting that the high burden of maternal death in poorer states
is not due to an excess of one or more causes of direct obstetric deaths.

Lack of quality care in the health facilities was perceived as the factor most contributing to the maternal deaths by family members of deceased women. Proximal factors, which encompassed any pregnancy complication or medical comorbidity, were the strongest predictors of women dying in pregnancy followed by lack of access to the health facility. More importantly, the study showed that the effects of living rurally and being poor could be mitigated by improving access to the health facility. Other risk factors identified were younger or older maternal age, belonging to a scheduled tribe or caste social group, and not being enrolled in a health scheme.

The WHO reported MMR for India in 2010 was 208/100,000 live births compared with 383/100,000 live births calculated in our study population for a similar period (2007–2009). This discrepancy reflects the high burden of maternal mortality in India’s nine socioeconomically disadvantaged states. Moreover, in our study, more than half of the maternal deaths had not been previously recorded. Efforts to create a national electronic database for maternal death surveillance in India began in 2013 but the progress is still limited, mainly due to lack of resources.

The association between proximal factors and maternal death was strengthened after accounting for other factors showing that these complications remain the most important risk factors for maternal death, thus reinforcing the importance of high-quality antenatal care, availability of basic emergency obstetrical care and postnatal care. Nonetheless, in our study population, poor quality of care was reported as the factor most contributing to the maternal death in 55% of the deaths.

In 2005, the Indian government implemented the NRHM to address gaps in maternal healthcare. Improving the access to and quality of care, particularly for rural areas in high focus states, were the main objective of this initiative. Since 2005, India has seen some improvements. Institutional deliveries increased from 39% in 2005 to 79% in 2013. Complete antenatal care coverage increased from 37% to 51% and postnatal care increased from 27% to 36%. However, studies show that the programme has had little or no effect on clinical outcomes. For example, despite the increase in health facility deliveries, there has been no demonstrated decline in maternal mortality.

Studies have repeatedly shown that quality of care is lacking in public health facilities, including non-availability of essential medicines such as uterotonics and antibiotics, and lack of facilities for caesarean section and blood transfusion. Further, government reports on the state of public facilities in these nine states have reported lack of toilet facilities, unreliable electricity and unsatisfactory cleanliness, and lack of basic measures of obstetrical care such as adequate hand hygiene. Moreover, there have been reports of verbal and physical abuse of staff towards patients.

Conforming with the findings of other studies, age and maternal death exhibited a strong U-shaped association in which the youngest (women aged 13–19 years) and the oldest age group (women aged 40–49 years) had the highest risk of dying. India’s National Family Health Survey showed that of women aged 20–49 years, 27% had been married before the age of 15 years and 58% were married before the legal age of marriage of 18 years. In addition, 30% of Indian women had given birth by age 19 years. While age itself is not a modifiable risk factor, childbearing age should be regarded as one. Women should be able to exert control over when they choose to become pregnant. Policies supporting universal access to contraception, family planning counselling, safe abortion and promoting women’s empowerment need continued attention in India.

**Conclusion**

According to this study it is observed that the high level of maternal mortality in India is a critical policy concern. A huge inter-state and intrastate disparities in MMR remain a major concern. It is important to mention that economic performance alone would be insufficient to achieve faster reductions in MMR. In India, these groups largely include women and tribal sub-groups living in unfavourable geographic locations demotivating (inaccessible rural areas and hilly regions). Moreover, states with high MMR also tend to have an unfavourable geography; therefore, economic growth would largely be confined to advantaged locations, and the remotest and tribal areas will remain underserved and have high levels of MMR. Economic growth may help initiate improvements in MMR but, to reduce MMR faster, simultaneous investment is important in strengthening the health system; education and empowering women; and making available qualified human resources in health, good governance, and transportation facilities.
Also, improvement in recording and sharing vital health (and health-related) information is critical to facilitate policymaking and enhance effectiveness of various interventions. India’s developmental narrative should display increased socio-political commitment towards health, one that could place India ahead of other countries.

**Ethical Permission:** Obtained

**Conflict of Interests:** None

**Funding:** None

**References**

A Rare Complication of the Non-Union of Maxilla After Lefort I Osteotomy

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Abstract

Lefort I osteotomies are routinely performed for correction of dentofacial deformities. There are reports of a wide number of complications after Lefort I osteotomies. Due to the rich vascular supply of maxilla, non-union is a very rare complication. The authors present two cases of non-union of maxilla after Lefort I osteotomy, with a brief discussion on the probable etiologies and their management.

Keywords: Lefort I osteotomy, Non-union of maxilla, Iliac bone graft, Maxillary mobility, Floating Maxilla.

Introduction

Lefort I osteotomy is one of the most widely performed surgeries across the maxillofacial spectrum. In the United States of America, there were about fifteen thousand Le fort I osteotomies performed over the course of 9 years[¹]. Lefort I osteotomies are associated with various intra-operative and post-operative complications[²] which can be further divided into anatomic, septic, neurologic, otologic and vascular categories[³]. Non-union at the osteotomy site is a serious complication, which invariably demands surgical intervention.

In this article, the authors report two cases of this complication after Lefort I osteotomy and review the literature.

Case Reports:

Case 1: A 29-year-old patient reported to Meenakshi Ammal Dental College and Hospital with a complaint of pain and mobility in the maxilla for a time period of about 5 years. She gave a history of being operated thrice in a different hospital within a time span of 2 years. She underwent the first surgery for bimaxillary protrusion in 2011. She had an uneventful immediate post-operative recovery but had reported back to them with a complaint of mobility of the maxilla and underwent two surgeries for the same in 2012. In both the instances, the pre-existing implants were removed, followed by freshening the edges of the non-united bone segments and resecuring them with a newer set of implants.

Clinical examination revealed the presence of mobility of maxilla and tenderness on the maxillary vestibule. Radiographic examination showed that the edge of the osteotomized segment was in close proximity to the infraorbital foramen (Fig. 1). The authors diagnosed her with maxillary non-union and planned for a surgical intervention. Pre-surgical orthodontics was carried out and bite planes were cemented to the mandibular posterior teeth bilaterally (Figs. 2, 3).

Intra-operatively, the authors observed the

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eburnation of bone edges at the osteotomy site and they completely mobilized the maxillary segment. Autogenous cortico-cancellous iliac bone graft was harvested and sandwiched in between the osteotomized segments. Mandibular subapical osteotomy was also performed and the osteotomized segment was moved downwards. A stable internal fixation was performed in both the jaws (Figs. 4,5).

The patient had a post-operative follow-up of 2 years and the authors observed a satisfactory healing with a stable maxilla and recorded a significant improvement in the vertical dimension.

**Case 2:** A 23-year-old patient who reported to Meenakshi Ammal Dental College and Hospital with malocclusion and facial deformity was examined and diagnosed with vertical maxillary excess. After presurgical orthodontics and cephalometric analysis, it was planned to impact the maxilla. Intra-operatively, the patient underwent Lefort I impaction, after complete mobilization of the maxilla. Internal fixation was performed in the maxilla using indigenous titanium implants.

The patient had an uneventful immediate postoperative recovery. In the third post-operative month, the patient presented with a complaint of pain and discomfort in the maxilla at the Lefort I level with no signs of inflammation or oro-antral communication. On radiographic evaluation, the internal fixation was right in place, and there was no evident maxillary sinus pathology. He was treated with analgesics and anti-inflammatory drugs. In the sixth post-operative month, the patient reported of recurrent pain and mild mobility of the maxillary segment with clicking noise on mastication.

Clinical examination confirmed the mobility of maxilla and an orthopantomogram revealed broken titanium plates at the osteotomy site. He was diagnosed with maxillary non-union and was planned for surgical intervention. Intra-operatively, the authors observed fracture of two plates, loosening of screws and eburnation of the bone edges at the osteotomy site (Fig. 6). The rounded bone margins were freshened, and the vascularity was ensured with adequate bleeding points. Onlay bone grafting was performed with autogenous cortico-cancellous iliac bone graft, which was secured through titanium anchor screws (Fig. 7). The patient had an uneventful post-operative recovery phase with no discomfort. Post-operative radiographs showed good uptake of the bone graft with intact titanium plates and screws.
Fig. 4 Post-operative orthopantomogram

Fig. 5 Post-operative lateral cephalogram
Fig. 6 Eburnated bone edges at the osteotomy site

Fig. 7 Autologous cortico-cancellous iliac bone was sandwiched between the bone edges and fixed
Discussion

Lefort I osteotomies have been the mainstay for the correction of severaldentofacial deformities like maxillary excess, deficiency, malposition or asymmetry. The first description of a maxillary osteotomy was published by von Langenbeck in 1859. After Rene Lefort’s landmark article in 1901, Wassmund was the first to describe the classic Lefort I osteotomy in 1921. Through the contributions of eminent surgeons like Axhausen, Schuchardt and Obwegeser\[4,5\], the technique of Lefort I osteotomy has evolved with better adaptation between the bone surfaces, improved stability, and lesser rate of complications.

Non-union of maxilla is a serious but a very rare complication after Lefort I osteotomy. The authors retrospectively reviewed the patient data and found that there were about 150 Lefort I osteotomies performed in their unit for the last 10 years. They identified 2 cases of non-union and report an incidence rate of about 3%. Kramer et al\[2\] reported an incidence rate of about 1% while Imholz et al\[6\] reported an incidence rate of about 2.6% in patients who underwent Lefort I osteotomies. Postoperative unstable dental occlusion, infection, osteosynthesis failures, insufficient bone contact are some of the probable etiological factors for non-union\[7\]. Maxillary mobility is the single most important diagnostic feature of non-union. Otterloo et al\[8\] had described this condition as a ‘floating maxilla’. Radiographic investigations are mandatory to confirm the presence of fractured plates, if any. Advancements in imaging techniques like 3D reconstruction of the computed tomography sections aid in formulating a proper treatment plan. Imholz et al reported that the mean delay between osteotomy and the non-union was 15.5 months. The time elapsed from the time of surgery to the occurrence of symptoms varied from 6 to 56 months\[6\].

Maxilla is a membranous bone with a thin cortical structure, variable bone density and with excellent inherent vascularity. It houses the maxillary antrum with thin external walls. Any major movement involving the maxilla might not produce edge to edge bone contact unlike the mandibular movements, thereby increasing the prospect of secondary healing after maxillary osteotomies. In cases of superior repositioning of the maxilla, there is a resulting ‘telescoping effect’, which prevents end to end approximation of the maxillary segments\[9\]. This lack of approximation would create a space that might lead to pseudoarthrosis\[10\] and impair normal bone healing.

In the first case, the patient was treated in a different centre and was operated the first time for vertical maxillary excess and bimaxillary protrusion. Later, she underwent a couple of surgeries for non-union of maxilla, which arose as sequelae to Lefort I impaction. The authors attribute the reasons for non-union to be trauma from occlusion, deep bite, antero-posterior movements of more than 6mm without bone grafting, improper plate fixation, infection and sinus pathologies.

The impetus for the edge of the osteotomized segment to be in close proximity to the infraorbital foramen, could be due to the repetitive freshening of the bony edges and lack of bone grafting.

Bite planes were fabricated and cemented to the mandibular posterior teeth bilaterally to relieve the anterior teeth from occlusal loading. Intraoperatively, in addition to mobilizing the maxilla, an anterior subapical osteotomy was performed in the mandible and the osteotomized segment was moved downwards to alleviate trauma from occlusion. The trauma from occlusion might have produced incessant minor movements that would have been a predisposing factor of non-union.

In the second case, the patient had no remarkable medical history. The radiologic and intraoperative findings indicated that the quality and morphology of the maxilla were normal and the patient reported with maxillary mobility at six months post-operatively.

The authors believe that in this case, the non-union might have been due to the ‘telescoping effect’, as the maxilla was superiorly repositioned. This might have resulted in the bending of titanium plates at acute angles and probably caused stress fractures of the plate. The patient initially experienced dull ache, followed by clicking, as the fractured plate became completely mobile with loosening of the screws.

Non-union in maxilla can be initially managed by restricting the patient to a soft diet, discontinuing or decreasing the strength of elastic traction, fabricating a modified splint to balance occlusion and eliminating para functional habits. Local and systemic measures are being used to treat post-operative infection. Robl et al recommends recreation of the osteotomy with aggressive mobilization, removal of surrounding fibrous tissues and
passive repositioning of the osteotomized segments. They recommend bone grafting and stabilization with rigid fixation to resist segmental displacement\textsuperscript{[11,12]}. Imholz et al stresses on the necessity of a revision surgery with a bone graft and a stronger osteosynthesis\textsuperscript{6}. The authors also recommend strict adherence to these protocols. They suggest the use of good quality titanium plates of 1.5mm size and advocate the clearance of sinus pathologies prior to performing a Lefort I osteotomy. They emphasize the necessity of using a block cortico-cancellous graft for movements of more than 6mm and in cases of cleft maxillary hypoplasia.

**Ethical Clearance:** Nil

**Source of Funding:** Meenakshi Academy of Higher Education and Research, Chennai, India

**Conflict of Interest:** Nil

**References**


Role of Plants in Biomonitoring Vehicular Emissions

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Abstract

Introduction: Air pollution caused by the pollutants present in the atmosphere which is harmful to the environment and the living population. The plants showed stunted growth, animal’s causes various form of diseases and the pollutants harmfully affect the human beings by causing respiratory problems and the whole environment is totally affected causing depletion of ozone layer and that directly or indirectly affects the living system present in the environment.

Materials and Method: The leaf samples were collected from the Sholinganallur area and authenticated. Later the samples were characterized for morphological characters, pigment analysis, Biochemical parameters and the score of tolerance index of Air pollution was calculated were tabled and graphed as per the standard protocol.

Results: The samples were collected from sholinganallur traffic zonal area and totally 14 leaf samples were gathered from the experimental site and was authenticated. The morphological characters of length and width of leaf samples were calculated and in Biochemical parameters, pH of leaf, Relative water content and ascorbic acid content showed good activity in evergreen shrub. In pigment analysis of chlorophyll, the maximum and minimum amount was found in evergreen shrub Bougainvillea glabra with 68.72mg/g and Tecoma capensis in 14.72mg/g. The APTI value was maximum and minimum in evergreen shrub Tabernaemontana divaricata with 114.66 and Nerium oleander with 48.05.

Conclusion: The plants found in and around the experimental area possess good activity against the air pollution and these plants can be kept at the roadside to prevent and withstand the air pollution in the environment.

Keywords: Evergreen tree/shrub, air pollution, APTI, vehicular emission

Introduction

The global impact in change of atmosphere [1] especially in metropolitan cities are due to rapid industrialization and urbanization process causes serious effects of air pollution on both human and plant communities [2]. Due to industrialization, urbanization and raising human population [3] vehicles play a predominant role in the transport sector. Approximately 60–70% of air pollution is produced from cities across the globe by vehicular emissions which are randomly increasing day by day as means of transportations [4].

There are enormous number of pollutants are released from the vehicles are carbon monoxide, particulates, hydrocarbons, heavy metals, nitric oxide, sulphur dioxide and so on [5,6]. The emission of oxidized carbon monoxide and hydrocarbons from the fuel is a product of incomplete combustion (i.e) lacks the combustion of air leading to insufficient oxygen and will not form an end product of carbon dioxide (CO₂). Ground level Ozone (i.e) smog is formed when hydrocarbons combine with nitrogen oxides and sunlight. The smogs are widely spread and major interactable air pollution. Nitric oxide (NO) like hydrocarbons is predominant source in the formation of ozone and produce acid rain [7]. This harmful chemical has an adverse effect on soil and plants grown in that area [8]. This serious impact on plant health changes the biochemical parameters such as the action
of enzymes, proteins, pigments, ascorbic acid and sugar contents \[9\] rate of photosynthesis, seed germination \[10\].

Leaves are the most receptive part exposed widely to the polluted air causing a change based on its sensitivity \[11\]. On the surface of leaf or on the stomatal pores dust and other particulate matter get adsorbed \[12\] and such exposed plant shows changes internally and then the plant after severe effect shows external changes like chlorosis, necrosis and epinasty \[13\] when exposed to air pollution \[14\]. Thus Air pollution tolerance indices were examined for the selected area and these plants are very much useful in afforestation, reforestation and development of green belt.

**Materials and Method**

**Leaf sample collection:** The samples were collected from the experimental sites from the road sides of Mohamed Sathak College of Arts and Science, Sholinganallur, Chennai, Tamil Nadu, India. The study was carried out and samples were collected before the onset of summer season and the plants were selected based on the change in morphology of leaves due to vehicular pollution.

**Identification of collected samples:** The collected leaf samples were identified based on its morphological characters from the book, Flora of the Presidency of Madras by Gamble, 1847-1925 and the samples were authenticated \[15\].

**Morphological characters of identified plants:** The collected leaf samples were identified for its family, common name through previous literatures and morphological characters like leaf length (cm), leaf width (cm), weight of leaf with dust (mg) and without dust (mg) were estimated.

**Biochemical parameters:** The pH of the leaf was determined by\[16\] Krishna Veni, 2014; \[17\] Prasad and Rao, 1982. Relative water content was determined by Liu and Ding 2008 \[14\] and Sen., 1978 \[18\]. Ascorbic acid content was determined by metaphosphoric acid (5%)-acetic acid (10%) solution. Total chlorophyll content was performed by the method of Arnon (1949) \[8\].

**Air Pollution Tolerance Indices (APTI):** The Air Pollution Tolerance Indices (APTI) were calculated based on Singh and Rao (1983) \[19\].

**Results and Discussion**

**Collection of samples:** The leaves were collected from traffic zones of Sholinganallur around the campus of Mohamed Sathak College of Arts and Science, Chennai where vehicular emission was high during the peak hours where most vehicles travel towards the IT parks. The collected mature leaves were stored in a polythene bag for morphological and biochemical analysis.

**Identification of collected samples:** The collected leaf samples were photographed from the collected sites and authenticated. The list of 14 plants were collected from the experimental site and tabulated (Table 1; Fig 1).

**Table 1: List of leaves collected from the experimental site, Sholinganallur, Chennai**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Scientific name</th>
<th>Family</th>
<th>Common name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tabernaemontana divaricata</td>
<td>Rosaceae</td>
<td>Cherry laurel</td>
</tr>
<tr>
<td>2</td>
<td>Plumeria rubra</td>
<td>Apocynaceae</td>
<td>Red frangipani</td>
</tr>
<tr>
<td>3</td>
<td>Plumeria obtusa</td>
<td>Apocynaceae</td>
<td>Singapore graveyard</td>
</tr>
<tr>
<td>4</td>
<td>Bougainvillea glabra</td>
<td>Nyctaginaceae</td>
<td>Paper flower</td>
</tr>
<tr>
<td>5</td>
<td>Caryota mitis</td>
<td>Arecaceae</td>
<td>Burmese fishtail palm</td>
</tr>
<tr>
<td>6</td>
<td>Caryota urens L.</td>
<td>Arecaceae</td>
<td>Fishtail wine palm</td>
</tr>
<tr>
<td>7</td>
<td>Pongamia pinnata</td>
<td>Fabaceae</td>
<td>Indian beech</td>
</tr>
<tr>
<td>8</td>
<td>Sterculia foetida</td>
<td>Malvaceae</td>
<td>Guiana chestnut</td>
</tr>
<tr>
<td>9</td>
<td>Nerium oleander</td>
<td>Apocynaceae</td>
<td>Oleander</td>
</tr>
<tr>
<td>10</td>
<td>Ficus benghalensis</td>
<td>Moraceae</td>
<td>Banyan</td>
</tr>
<tr>
<td>11</td>
<td>Tecoma capensis</td>
<td>Bignoniaceae</td>
<td>Cape honeysuckle</td>
</tr>
<tr>
<td>12</td>
<td>Spathodea campanulata</td>
<td>Bignoniaceae</td>
<td>African tulip tree</td>
</tr>
<tr>
<td>13</td>
<td>Muntingia calabura</td>
<td>Muntingiaceae</td>
<td>Calabur tree</td>
</tr>
<tr>
<td>14</td>
<td>Tecoma stans</td>
<td>Bignoniaceae</td>
<td>Yellow trumpetbush</td>
</tr>
</tbody>
</table>
Categorization of collected leaf samples: The leaf samples from experimental site were collected, identified and authenticated. Based on the literature survey the plants are categorized or grouped into three distinct phase’s namely deciduous tree, Evergreen shrub and Evergreen tree. The entire study was distinguished or compared based on these three categories (Table 2).

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Category of leaf samples from the experimental site</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Deciduous tree</td>
</tr>
<tr>
<td>2</td>
<td>Evergreen shrub</td>
</tr>
<tr>
<td>3</td>
<td>Evergreen tree</td>
</tr>
</tbody>
</table>

Morphological measurements of collected leaf samples: The length of the leaf was high in Plumeria obtusa and leaf width was found to be lower when compared to Caryota urens. Similarly, the weight of the leaf was found to have significant changes when weighed with dust and after cleaning the dust (Table 3). According to the results obtained, the accumulation of dust was more on leaf surface which indicates the polluted environment in the selected site.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the Plants</th>
<th>Leaf Length (cm)</th>
<th>Leaf Breadth (cm)</th>
<th>Initial Leaf weight (mg)</th>
<th>Final Leaf weight (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tabernaemontana divaricata</td>
<td>9.3</td>
<td>2.7</td>
<td>0.3263</td>
<td>0.1373</td>
</tr>
<tr>
<td>2</td>
<td>Plumeria rubra</td>
<td>23.3</td>
<td>10.2</td>
<td>11.6983</td>
<td>10.5823</td>
</tr>
<tr>
<td>3</td>
<td>Plumeria obtusa</td>
<td>28.2</td>
<td>7.4</td>
<td>8.2523</td>
<td>6.3545</td>
</tr>
<tr>
<td>4</td>
<td>Bougainvillea glabra</td>
<td>7.2</td>
<td>5.2</td>
<td>0.5346</td>
<td>0.4986</td>
</tr>
<tr>
<td>5</td>
<td>Caryota mitis</td>
<td>9.6</td>
<td>4.8</td>
<td>0.5359</td>
<td>0.5021</td>
</tr>
<tr>
<td>6</td>
<td>Caryota urens L.</td>
<td>23.1</td>
<td>10.4</td>
<td>3.9275</td>
<td>3.7621</td>
</tr>
<tr>
<td>7</td>
<td>Pongamia pinnata</td>
<td>9.9</td>
<td>4.2</td>
<td>0.2986</td>
<td>0.2972</td>
</tr>
<tr>
<td>8</td>
<td>Sterculia foetida</td>
<td>13.6</td>
<td>6.7</td>
<td>0.8601</td>
<td>0.7984</td>
</tr>
<tr>
<td>9</td>
<td>Nerium oleander</td>
<td>3.9</td>
<td>2.6</td>
<td>0.0970</td>
<td>0.0901</td>
</tr>
<tr>
<td>10</td>
<td>Ficus benghalensis</td>
<td>13.9</td>
<td>8.9</td>
<td>2.3733</td>
<td>2.3198</td>
</tr>
<tr>
<td>11</td>
<td>Tecoma capensis</td>
<td>20.2</td>
<td>7.4</td>
<td>2.3738</td>
<td>2.3245</td>
</tr>
<tr>
<td>12</td>
<td>Spathodea campanulata</td>
<td>21.1</td>
<td>4.3</td>
<td>0.8845</td>
<td>0.7124</td>
</tr>
<tr>
<td>13</td>
<td>Muntingia calabura</td>
<td>13.5</td>
<td>4.9</td>
<td>0.6947</td>
<td>0.5939</td>
</tr>
<tr>
<td>14</td>
<td>Tecoma stans</td>
<td>18.8</td>
<td>2.9</td>
<td>1.7749</td>
<td>1.7110</td>
</tr>
</tbody>
</table>

Biochemical parameters of the samples:

pH: The leaf extract pH was ranged from acidic condition of 1.19 to slight alkaline condition of 7.82. From the experimental site only one deciduous tree was found with a pH of 6.21 from Plumeria rubra (L.). Evergreen shrubs totally 7 are present in experimental site of which maximum acidic condition was present in Bougainvillea glabra of pH 1.19 and minimum acidic condition was found in Tecoma capensis with a pH of 6.50. Evergreen trees totally 8 are present in experimental site of which maximum acidic condition was present in Muntingia calabura with a pH of 5.30 and slightly alkaline condition was found in Ficus benghalensis with a pH of 7.82 (Table 4; Graph 1). In a study conducted by Bharti et al., 2017, Ficus benghalensis showed pH of 8.2 where the pollutant converts the hexose present in the plant to ascorbic acid.
Table 4: pH of the collected leaf samples from the experimental site

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the Plants</th>
<th>pH value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tabernaemontana divaricata</td>
<td>6.05</td>
</tr>
<tr>
<td>2</td>
<td>Plumeria rubra</td>
<td>6.21</td>
</tr>
<tr>
<td>3</td>
<td>Plumeria obtusa</td>
<td>6.10</td>
</tr>
<tr>
<td>4</td>
<td>Bougainvillea glabra</td>
<td>1.19</td>
</tr>
<tr>
<td>5</td>
<td>Caryota mitis</td>
<td>6.48</td>
</tr>
<tr>
<td>6</td>
<td>Caryota urens L.</td>
<td>5.74</td>
</tr>
<tr>
<td>7</td>
<td>Pongamia pinnata</td>
<td>5.65</td>
</tr>
<tr>
<td>8</td>
<td>Sterculia foetida</td>
<td>5.76</td>
</tr>
<tr>
<td>9</td>
<td>Nerium oleander</td>
<td>5.50</td>
</tr>
<tr>
<td>10</td>
<td>Ficus benghalensis</td>
<td>7.82</td>
</tr>
<tr>
<td>11</td>
<td>Tecoma capensis</td>
<td>6.50</td>
</tr>
<tr>
<td>12</td>
<td>Spathodea campanulata</td>
<td>6.33</td>
</tr>
<tr>
<td>13</td>
<td>Muntingia calabura</td>
<td>5.30</td>
</tr>
<tr>
<td>14</td>
<td>Tecoma stans</td>
<td>5.78</td>
</tr>
</tbody>
</table>

Graph 1. pH level of the collected leaf samples

**Relative water content:** RWC varied greatly from 13.39% to 80.78%. RWC in deciduous tree was found to have high content of 72.38%. The RWC in evergreen shrub was found to be minimum in *Bougainvillea glabra* with 13.39% and maximum in *Tecoma capensis* with 59.61%. The RWC in evergreen tree was found to be minimum in *Spathodea campanulata* with 16.94% and maximum was found in *Caryota urens* with 80.78% (Table 5; graph 2). Air pollutant increases the RWC in plants under stress which undergoes the changes in physiological functions during Transpiration and facilitates drought conditions leads to early senescence[20].
Table 5: RWC of the collected leaf samples from the experimental site.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the Plants</th>
<th>RWC %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tabernaemontana divaricata</td>
<td>33.33</td>
</tr>
<tr>
<td>2.</td>
<td>Plumeria rubra</td>
<td>72.38</td>
</tr>
<tr>
<td>3.</td>
<td>Plumeria obtusa</td>
<td>57.10</td>
</tr>
<tr>
<td>4.</td>
<td>Bougainvillaea glabra</td>
<td>13.39</td>
</tr>
<tr>
<td>5.</td>
<td>Caryota mitis</td>
<td>17.93</td>
</tr>
<tr>
<td>6.</td>
<td>Caryota urens L.</td>
<td>80.78</td>
</tr>
<tr>
<td>7.</td>
<td>Pongamia pinnata</td>
<td>21.42</td>
</tr>
<tr>
<td>8.</td>
<td>Sterculia foetida</td>
<td>30.63</td>
</tr>
<tr>
<td>9.</td>
<td>Nerium oleander</td>
<td>41.66</td>
</tr>
<tr>
<td>10.</td>
<td>Ficus benghalensis</td>
<td>45.00</td>
</tr>
<tr>
<td>11.</td>
<td>Tecoma capensis</td>
<td>59.61</td>
</tr>
<tr>
<td>12.</td>
<td>Spathodea campanulata</td>
<td>16.94</td>
</tr>
<tr>
<td>13.</td>
<td>Muntingia calabura</td>
<td>20.96</td>
</tr>
<tr>
<td>14.</td>
<td>Tecoma stans</td>
<td>45.08</td>
</tr>
</tbody>
</table>

Estimation of Ascorbic Acid: The Ascorbic acid present was ranged from 12.50mg/g to 27.78mg/g. In deciduous tree *Plumeria rubra* was found to be 16.59 mg/g. In evergreen shrub, the ascorbic acid content was minimum in *Pongamia pinnata* with 12.50mg/g and maximum in *Tecoma capensis* with 27.78mg/g. In evergreen tree, the presence of Ascorbic acid content was minimum in *Sterculia foetida* with 14.80mg/g and maximum in *Spathodea campanulata* with 26.67mg/g (Table 6; Graph 3).
Table 6: Ascorbic acid content of the leaf samples from the experimental site.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the Plants</th>
<th>Ascorbic acid mg/g</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tabernaemontana divaricata</td>
<td>21.89</td>
</tr>
<tr>
<td>2.</td>
<td>Plumeria rubra</td>
<td>16.59</td>
</tr>
<tr>
<td>3.</td>
<td>Plumeria obtusa</td>
<td>16.88</td>
</tr>
<tr>
<td>4.</td>
<td>Bougainvillea glabra</td>
<td>14.45</td>
</tr>
<tr>
<td>5.</td>
<td>Caryota mitis</td>
<td>17.39</td>
</tr>
<tr>
<td>6.</td>
<td>Caryota urens L.</td>
<td>20.60</td>
</tr>
<tr>
<td>7.</td>
<td>Pongamia pinnata</td>
<td>21.50</td>
</tr>
<tr>
<td>8.</td>
<td>Sterculia foetida</td>
<td>14.80</td>
</tr>
<tr>
<td>10.</td>
<td>Ficus benghalensis</td>
<td>22.48</td>
</tr>
<tr>
<td>11.</td>
<td>Tecoma capensis</td>
<td>27.78</td>
</tr>
<tr>
<td>12.</td>
<td>Spathodea campanulata</td>
<td>26.67</td>
</tr>
<tr>
<td>13.</td>
<td>Muntingia calabura</td>
<td>16.63</td>
</tr>
<tr>
<td>14.</td>
<td>Tecoma stans</td>
<td>15.80</td>
</tr>
</tbody>
</table>

Graph 3. Ascorbic acid of the plant sample

**Estimation of chlorophyll content:** The total chlorophyll content was found to be in range of 14.72mg/g to 68.72mg/g. In deciduous tree *Plumeria rubra* was found to be 27.03mg/g. In evergreen shrub the minimum chlorophyll content was found to be in *Tecoma capensis* in 14.72mg/g where maximum chlorophyll content was found to be in *Bougainvillea glabra* in 68.72mg/g. In evergreen tree the minimum chlorophyll content was found to be in *Spathodea campanulata* in 17.35mg/g and maximum chlorophyll content was found to be in *Sterculia foetida* 63.12mg/g (Table 7; graph 4).
Table 7: Total chlorophyll content of the leaf samples from the experimental site.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the plant</th>
<th>Total chlorophyll mg/g</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tabernaemontana divaricata</td>
<td>44.81</td>
</tr>
<tr>
<td>2.</td>
<td>Plumeria rubra</td>
<td>27.03</td>
</tr>
<tr>
<td>3.</td>
<td>Plumeria obtusa</td>
<td>28.05</td>
</tr>
<tr>
<td>4.</td>
<td>Bougainvillea glabra</td>
<td>68.72</td>
</tr>
<tr>
<td>5.</td>
<td>Caryota mitis</td>
<td>50.13</td>
</tr>
<tr>
<td>6.</td>
<td>Caryota urens L.</td>
<td>43.24</td>
</tr>
<tr>
<td>7.</td>
<td>Pongamia pinnata</td>
<td>36.71</td>
</tr>
<tr>
<td>8.</td>
<td>Sterculia foetida</td>
<td>63.12</td>
</tr>
<tr>
<td>10.</td>
<td>Ficus benghalensis</td>
<td>23.54</td>
</tr>
<tr>
<td>11.</td>
<td>Tecoma capensis</td>
<td>14.72</td>
</tr>
<tr>
<td>12.</td>
<td>Spathodea campanulata</td>
<td>17.35</td>
</tr>
<tr>
<td>13.</td>
<td>Muntingia calabura</td>
<td>22.59</td>
</tr>
</tbody>
</table>

Air Pollution Tolerance Indices (APTI): The value ranged from 48.05 to 114.66 which reveals that the plant present in the experimental sites were all tolerant towards the vehicular emissions but the most tolerant plant was evergreen shrub compared to deciduous an evergreen tree. The deciduous tree showed the value of 62.38 and in evergreen shrub the APTI value was tolerable in all collected leaf samples but minimum in Nerium oleander with 48.05 and maximum in Tabernaemontana divaricata with 114.66. In evergreen tree the APTI value was minimum in Muntingia calabura with 48.47 and maximum value in Caryota urens with 108.97 (Table 8; Graph 5).
Table 8: Air Pollution Tolerance Indices of the leaf samples from the experimental site.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the Plants</th>
<th>APTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tabernaemonta divaricata</td>
<td>114.66</td>
</tr>
<tr>
<td>2.</td>
<td>Plumeria rubra</td>
<td>62.38</td>
</tr>
<tr>
<td>3.</td>
<td>Plumeria obtusa</td>
<td>63.35</td>
</tr>
<tr>
<td>4.</td>
<td>Bougainvillea glabra</td>
<td>102.35</td>
</tr>
<tr>
<td>5.</td>
<td>Caryota mitis</td>
<td>100.23</td>
</tr>
<tr>
<td>6.</td>
<td>Caryota urens L.</td>
<td>108.97</td>
</tr>
<tr>
<td>7.</td>
<td>Pongamia pinnata</td>
<td>55.09</td>
</tr>
<tr>
<td>8.</td>
<td>Sterculia foetida</td>
<td>105.00</td>
</tr>
<tr>
<td>9.</td>
<td>Nerium oleander</td>
<td>48.05</td>
</tr>
<tr>
<td>10.</td>
<td>Ficus benghalensis</td>
<td>74.99</td>
</tr>
<tr>
<td>11.</td>
<td>Tecoma capensis</td>
<td>64.91</td>
</tr>
<tr>
<td>12.</td>
<td>Spathodea campanulata</td>
<td>64.84</td>
</tr>
<tr>
<td>13.</td>
<td>Muntingia calabura</td>
<td>48.47</td>
</tr>
<tr>
<td>14.</td>
<td>Tecoma stans</td>
<td>61.23</td>
</tr>
</tbody>
</table>

Graph 5. APTI of the leaf samples

Conclusion

The results of the present study revealed that vehicular emission in sholinganallur area are prevented by the plants present on the road side with good tolerance rate and among that evergreen shrub and evergreen tree can be planted more to prevent air pollution from these vehicular emission sites. Various biochemical parameters behaved differently in the studied plant species, however, ascorbic acid content was found to be the most crucial factor providing tolerance to the plants against air pollution. So, Tecoma capensis were found to be tolerant, and can be incorporated into a greenbelt design to assist the air pollution management practices.

Ethical Clearance: Nil

Source of Funding: Meenakshi Academy of Higher Education and Research, Chennai, India
Conflict of Interest: Nil

References


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- Findings
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