pISSN: 2220-7562
eISSN: 2617-9482
Recognized by PMDC

JBUMDC

Journal of Bahria University Medical & Dental College

Volume 9 Issue 1, January - March 2019

Bahria University Medical & Dental College Adjacent PNS SHIFA, DHA Phase II, Karachi

JBUMDC
Journal of Bahria University Medical & Dental College
Peer Reviewed Multidisciplinary Quarterly Published Journal
ISSN (print): 2220-7562, ISSN (online): 2617-9482
Recognized by PM&DC (IP/0072)
Online edition is available at URL: https://jbumdc.bahria.edu.pk,
Indexed with Index Medicus for the Eastern Mediterranean Region (IMEMR),
ROAD Directory of Open Access Scholarly Resources at https://portal.issn.org/
Pakmedinet at www.pakmedinet.com/jbumdc,
Google Scholar at https://scholar.google.com.pk/,
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Published by: Bahria University Medical & Dental College

JBUMDC

Journal of Bahria University Medical & Dental College

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Impact Of Dietary Measures In Autoimmune Diseases

Nasim Karim

The immune system of an individual upon activation by antigens produces response to pathogenic microorganisms their products and to body self-antigens. The latter being known as "Autoimmune Response." Lymphocytes as T cells and B cells as well as macrophages take part in this response. The T- cells are responsible for releasing lymphokines, B - cells for producing antibodies or immunoglobulins while macrophages bring about the processing of antigens to immunogenic units of the body. Thus autoimmune diseases are characterized by response of immune system to one`s own tissues and organs and is hence abnormal. At present about eighty different types of autoimmune diseases are described[1]. They include rheumatoid arthritis, systemic lupus erythematosus, type-1 diabetes, celiac disease, Graves' disease, Sjogren syndrome, inflammatory bowel disease, multiple sclerosis, psoriasis etc[2].

Globally the incidence and prevalence of autoimmune diseases have enormously increased in the last thirty years[3]. Exact etiology of these diseases is yet not clear. Some diseases run in families like systemic lupus erythematosus while others may be triggered by infections, environmental and nutritional factors. Environmental factors are said to have more influence than genetic ones on the development of these diseases. Somehow it is documented that women are more commonly affected in comparison to men. In early part of 1900 first description of autoimmune diseases was put forward. The pathological characteristic features of these diseases are damage to tissues and their destruction, alteration in organ growth and function secondary to production of autoantibodies, which are capable of maintaining their production once the process is initiated. Blood vessels, RBCs, joints, connective and muscles tissues, thyroid, pancreas and skin are the common culprits. Tiredness and low-grade fever are among common features observed in patients suffering from such diseases[4].

Although non-steroidal anti-inflammatory drugs (NSAIDs) and immuno-suppressant drugs are the main stay of treatment with use of intravenous immunoglobulin also but treatment is tailored depending upon the type of disease and severity at the time of presentation. These agents tend to improve the features of patients with no cure till date. For this reason researchers and scientists have been working on the insights of ecological and nutritional solutions along with life style changes as a paradigm shift, to control and or reduce the morbidity and mortality associated with such diseases. Provision of healthy diet, BMI within the specified range, proper sleep and exercise and stress reduction are very beneficial in such patients[5].

In diet some foods needs to be avoided completely like sugar including the artificial sweeteners, fats (trans or hydrogenated), alcohol, food additives and preservatives, caffeine, corn syrup with high fructose content, junk, fast and processed food. Gluten, dairy, legumes, corn, soy, eggs, nightshades (tomatoes, peppers, potatoes, and eggplant), citrus, yeast etc. should also be avoided as they contribute to inflammatory process[6]. Gluten causes release of zonulin in small intestine leading to opening up of tight junctures in gut and creates leaky gut which is precursor of autoimmunity. Besides gluten is structurally similar to many tissues in our body like thyroid gland and promotes molecular mimicry phenomenon. In dairy and its products, casein, hormones and antibiotics are present which exacerbates autoimmune diseases. Lectins and agglutinins found in grains and legumes are similar to gluten in behavior. Genetically modified form of corn and soy is mainly available now-a-days and is linked to exacerbation of at least 22 autoimmune diseases. Isoflavones present in soy are responsible for producing estrogen dominance[7,8]. Egg white contains lysozyme that promotes leaky gut. Alkaloids are present in potatoes, eggplant, tomatoes etc. These vegetables are called Nightshades and contribute to inflammatory process in autoimmune diseases. Citrus fruits are packed with histamine which stimulates our immune system to produce response where as yeast promotes candida overgrowth in gut therefore both of these should be avoided[9].

It is recommended that whenever possible organic products should be preferred for use as they are rich source of nutrients as well as antioxidants and at the same time they have low content of pesticides[10].

Five components must be made essential part and parcel of meals and food intake.

(1) Meat must be included in diet but of high quality for provision of plenty of amino acids. Organic, grass-fed, animal`s meat should be preferred for use as genetically engineered organisms - feed and spray of pesticides on animal feed does not provide us with quality proteins which the body requires to combat diseases specifically the autoimmune diseases.

(2) Half of any meal must be composed of green leafy vegetables including kale, spinach, broccoli, cauliflower, zucchini, asparagus, beets, sweet potatoes and squash etc. They contain rich amount of fiber, calcium and micronutrients and have natural detoxifying properties.

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Received: 23-11-18
Accepted: 12-12-18

(3) Fruits are rich source of vitamins, potassium, and folate. They contain fiber, help good bacteria in the gut and control constipation. Some fruits such as berries (raspberries, blackberries, blueberries, and strawberries) have low sugar content with excellent antioxidant ability.

(4) Healthy fats are essential component of balanced and healthy diet. They repair the cells lining the GIT, promote absorption of fat-soluble vitamins (A, D, K, and E) and provide satiety feeling. Trans fats and seed oils produced by industries like canola, soy and corn oil must be avoided while avocado, coconut and olive oils and animal fats that make the good fats should be made essential component of diet[11].

(5) Spices such as turmeric, ginger, cinnamon, cayenne pepper, cloves, garlic etc. are also helpful in controlling the inflammatory component tagged with autoimmune diseases. Leaky gut characterized by loss of epithelial lining integrity in intestinal tract as mentioned above triggers the initiation and development of autoimmune diseases. Fermented foods, unsweetened yogurts, coconut kefir and pro-biotic supplements are greatly beneficial in leaky gut condition that can also be controlled by whole foods and plant based dietary recipies[12].

Among non-pharmacological approaches dietary measures act as strong armor and exert profound impact on the quality of life of patients having autoimmune diseases. Thus body can be empowered by foods to fight and control autoimmune diseases. Dietary measures can be a powerful tool for fighting excessive inflammation associated with autoimmune diseases and can make these patients feel better and heal their bodies.

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Original Article

Evaluation Of Weight Changes On Wistar Rats Induced By Erythromycin And Aqueous Neem Leaves Extract

Nausheen Adnan, Uzma Bukhari, Iffat Raza

ABSTRACT:

Objective: To evaluate weight changes on the liver of male (albino wistar) rats induced by erythromycin. To assess the outcome of aqueous Neem leaf extract on erythromycin induced hepatic injuries.

Methodology: Eighty male albino wistar rats were taken randomly and were divided into 4 groups of 20 animals each. Group A as a control group. Group B rats were treated with erythromycin drug. Group C rats were treated with erythromycin along with Aqueous Neem leaves extract. Group D were given only Aqueous Neem leaves extract. Body weight of animals was recorded initially and also after experimentation. After 14 days animals were sacrificed, liver weight was also recorded.

Results: The liver of erythromycin treated animals group B were little bigger in size and more reddish. However erythromycin plus Neem treated animals of group C livers were almost like liver of control group A and only Neem given group D animals, liver were exactly same appearance like control group A.Rise in absolute and relative weight of liver was because of drug toxicity.

Conclusion: Its established from this recent study that Aqueous Neem leaves extract being a powerful antioxidant, decreased oxidative stress and hepatic injury caused by erythromycin.

Key Words: Erythromycin, Hepatotoxicity, Azadirachta indica (Neem).

INTRODUCTION:

Liver is an organ with soft parenchyma[1]. It is extremely vascular, pinkish brown in colour, friable easily with fine and smooth surface. Liver lies in abdomen below diaphragm secured by ribs[2]. The chief role of the liver is detoxification of exogenous and endogenous compounds and therefore its constant exposure to many xenobiotic, pollution, excessive consumption of alcohol, viral infections therapeutic agent's that leads toward compromised condition of liver[3].

Microscopically each lobe of liver constitute of hepatic lobule. Around the central vein hepatocytic plates are placed in radiating manner within these unevenly hexagonal hepatic lobule[4]. Hepatocytes are organized normally in the form of cords which are one or two cells separated by sinusoids[5]. Sinusoids are the channels that are composed of the hepatocytes plates[6].

Erythromycin is a commonly used antibiotic belonging to macrolide group of medicinal practice[7]. Erythromycin (EM) is now getting attention because of its unique anti-inflammatory properties. Erythromycin is valuable for the treatment of numerous infections, including tonsillitis, urinary tract infection, bronchopneumonia, mastitis, arthritis[8]. Hepatotoxic osage of Erythromycin stearate (100 mg/kg body weight) given orally for 14 days, daily to the rats that initiate liver damage as well as intense hepatotoxicity[9].

Azadirachta indica (Neem) is considered as a king of therapeutical plant kingdom. Broadly it has been utilized as numerous years prior and still been using for therapeutic and healing purposes. The plant of Neem related to the coastline forests of the tropical region of Sri Lanka, east India and Burma. It is generally predominant in Malaysia, Thailand, Pakistan, Indonesia and Myanmar[10], it is almost found in nearly about 72 countries[11]. Pharmacological investigations have recognized the estimation of restorative plants as conceivable reason for bioactive compounds[12].

The best dynamic component is azdirachtin and many other includes nimbin, sodium nimbinate, gedunin, nimbiol, salanin, nimbolinin, nimbidin, and queracetin Neem extract is rich of astringent and salts like fluoride, chloride calcium and sulphur[13]. It contains oils, resin, sterols, flavonoids, silica, gum and alkaloids[14]. It has been established that Neem extract has shown hepatoprotective properties in cases of paracetamol intoxication owing to its antioxidative activity[15].

This study aims to estimate the body weight & liver weight changes induced through erythromycin on the liver of male (albino wistar rats) and also to assess the outcome of aqueous Neem leaf extract on erythromycin induced hepatic injuries.

METHODOLOGY:

The research was carried out at the of animal house and the Department of Anatomy, Baqai Medical University Karachi

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Received: 17-09-18
Accepted: 07-12-18

.Eighty (80) grown up Albino Wistar male rats of 13-14 weeks of age, weighted between 180 to 200gms were procured from animal house of BMU. The animals were placed in plastic cages (5 animals in each cage) at 30 ^{0}C, controlled surroundings with around 14 day and 10 night hours cycle. The rats were given standard feed and water. Acclimatization of animals for about 10 days was assured, prior the start of study. Erythromycin tablets (erythrocin R) 500mg manufactued by Indus Pharma was purchased from medical store Malir Cantt, Karachi. Aqueous Neem leave Extract was made under supervision of Dr.Sadia senior Scientific Officer at Pakistan Council Scientific & Industiral Research(PCSIR) Karachi.

The Healthy animals having age of 13-14 week and weighing 180-200 grams were included in the study Only young, active and healthy animals were used for the experiment. Aged, weak and female rats were excluded from the study. Rats died during the study were also excluded. The design of study was experimental study, carried out to observe the outcome of inference.Twenty (20) rats were positioned randomly into four groups; "A", "B", "C" and "D" making it total Eighty (80) male rats. A group was kept as control and received no intervention and was fed with normal diet. Group B Received erythromycin only. Orally 100mg/kg body weight as a single dose daily for 14 days through gastric gavage. Group C received erythromycin 100mg/kg body weight as a single dose and aqueous Neem Extract of 500mg/kg body weight simultaneously through gastric gavage for 14 day. Group D received only aqueous Neem Extract of 500mg/kg body weight as a single dose through gastric gavage for 14 days. Neem extract and Erythromycin were given with the help of gastric gavage about 1 hour distinctly.

Before beginning of the study all the animal were weighted on electronic weighing machine and repeated after every 3rd day. According to group labeled on the cages, rats were kept in separate cages. After final dose animals were weighed for the final weights and then were placed in a glass container where they were given ether anesthesia. The rats were put on dissection board, given midline longitudinal incision, extending from the manubrium sterni until the lower abdomen, in order to expose the organs. After dissecting them, weight of liver was done on electronic scale with the help of following formula, relative weight was calculated[16].

$$\text{The Relative weight of liver} = \frac{\text{Liver Weight (gm)} \times 100}{\text{Final weight of the body (gm)}}$$

Statistical analysis was measured by SPSS (statistical package for social sciences) version 23, complete data was analyzed.Measurable investigation were performed by applying one-way analysis of variance (ANOVA) with the post – hoc Tukeys test taken after by understudy t test. If P value is less than or equivalent to 0.05, is considered significant with 95% confidence interval is used for comparison of means among all diverse groups.

RESULTS:

1. Body Weight

Mean value of initial body weight in group "A" were recorded 175.5±8.78 gm and mean value of final body weight in group A were 185.0±8.78gm respectively. It was significantly increased at final stage with mean 185±8.78gm. Data shown noticeably significant p value <0.01

In group B erythromycin treated rats, the mean values of the final body weight of erythromycin treated animals were recorded as 173.3±13.38gm. Data represents noticeable decrease ($p<0.01$) in final weight of animal body while compared to initial weight of animals body in group B.

In group C erythromycin and Neem treated rats, mean values of the initial body weight were recorded, 169.4±11.78gm. Final body weights of erythromycin and Neem treated animals of group C, the mean values were recorded 164.1±11.52gm respectively. The data presents noteworthy decrease in final body weight ($p<0.01$) when related to initial body weights of group C animals.

In positive control group D, mean values of initial body weights were recorded, 176.4±8.06gm respectively. Final body weight in group D animals, mean value were recorded 186.2±8.12gm. The data indicates significant increase in final body weight ($p<0.01$) of group D in comparison with to initial body weight of same group.

2. Absolute Liver Weight

The absolute liver weight, mean values of control group A were recorded 3.42±0.25gm.For absolute liver weight mean values in group B (erythromycin treated animals) were 5.38±0.67gm. Data displays there is noticeable increase in absolute weight of liver ($p<0.01$) in group B in comparison with control group A. Mean value of absolute weight of liver in group C (erythromycin plus Neem treated animals) were 4.76±0.44gm. According to the data there were significant rise in absolute liver weight ($p<0.01$) of group C animals when compare with control A group animals. The mean value of absolute liver weight in Neem group D animals were 3.41±0.22gm. The data present no significant change ($p>0.01$) in absolute liver weight of group D animals as compare with control group A animals.

3. Relative Liver Weight

In control group A animals, mean value of relative weight of liver were 11.3±6.7g.In erythromycin treated group B animals, mean value of relative weight of liver were 38.3±8.6gm.There is a markedly increase ($p<0.05$) in the relative liver weight in given data when compared with control group A animals. Mean value of relative weight of liver in erythromycin and Neem treated group C animals were 33.8±6.3gm.When comparison with group C animals to control group A animals there was marked increased

($p<0.05$) in the relative weight of liver. Mean value of relative liver weight in Neem given group D animals were10.7±5.9gm. The data represents no significant change ($p>0.05$) of relative weight of group D animals in comparison to relative liver weight of control group A animals

DISCUSSION:

This study showed that on gross examination in all the four groups, animals liver did not show any noticeable change in size and colour. There were no hemorrhages on the outer surface of the liver.

In this study after 2 week (14 days) of erythromycin treatment, we observed that group B (erythromycin treated) animals were sick as compared to the group A (control animals).

Groups	Treatment	Initial Weight (gm) Mean ±SD	Final weight (gm) Mean ±SD
A (n=20)	Control	175.5±8.78	185.0±8.57
B (n=20)	Treated	184.3±13.52	173.7±13.38
C (n=20)	Protected	169.4±11.78	164.1±11.52
D(n=20)	Positive Control	176.4±8.06	186.2±8.12

Table 1. Mean Body Weight (Gm) Of Rats Of Different Groups At Initial And Final Stage

Groups	Treatment	Liver Weight (gm) Mean ±SD
A (n=20)	Control	3.42±0.25
B (n=20)	Treated	5.38±0.67
C (n=20)	Protected	4.76±0.44
D(n=20)	Positive Control	3.41±0.22

Table 2. Mean Comparison Of Absolute Liver Weights (Gm) Of Animals

Groups	Treatment	Relative Liver Weight(gm), Mean ±SD
A (n=20)	Control	11.3±6.7
B (n=20)	Treated	38.3±8.6
C (n=20)	Protected	33.8±6.3
D(n=20)	Positive Control	10.7±5.9

Table 3. Mean Comparison Of Relative Liver Weights (Gm) Of Animals. *$p<0.05$ was obtained using Kruskal wallis test

Statistical Comparison	Difference (gm)
Final weight and initial weight within group A	-9.5 ±2.39
Final weight and initial weight within group B	10.6±1.46
Final weight and initial weight within group C	5.2±0.96
Final weight and initial weight within group D	-9.8±2.0

Table 4. Statistical Comparison Of Difference In Body Weight Within Same Group *p value = <0.01

The animals of group C appeared to be in better condition as compared to animals of group B.

Group A, animals gained weight when compared with their initial body weight. Whereas , group B (erythromycin treated animals) lost their weight during the period of study. Weight reduction could be due to a disturbed cytochrome P-450 hepatic metabolism.

The same weight changes were observed by N sambo and Nassr-Allah H, in their work they observed decreased in body weights when erythromycin was given in dose of 100mg/kg because erythromycin produces enzyme leakage and other sign of cytotoxicity and disturb the functions of rats liver[17,18]. In opposition to these findings , reported weight gain when using 50mg/kg/day erythromycin orally in preterm infants to manage the feeding intolerance in mainly fed milk formula. According to the author erythromycin was successful in assisting enteral feeding in very low birth weight preterm infants with moderate to severe gastric dysmotility[19]. David Amacher observed no changes in body weight in erythromycin treated animals in his work[20]. The animals of group C (erythromycin and aqueous Neem extract treated) lost weight after 14 days but this reduction in weight was much lower than group B (erythromycin treated animals). This is in correspondence with the study concluded by Ajibade Adeshina John, who reported body weight increase in animals after giving aqueous Neem leave extract and paracetamol together in order to observe the hepatoprotective effect of aqueous Neem extract on paracetamol induced hepatic damage.

As Neem leaves contains immunomodulatory, anti-inflammatory and adaptogenic activities, it inhibited paracetamol induced lipid peroxidation and protect reduction of sulfhydryl groups in hepatocytes[21]. This is also in agreement to the study by Mohamed A Dhkil. He documented that Neem leaves extract could increase body weight and daily food intake, when given orally about 500mg/kg body weight on the rats treated with cisplastin induced hepatotoxicity and oxidative stress in the female rats because of hepatoprotective nature of the Neem leaves. It have noticeable antiperoxidative and antioxidant radical scavenging activities in response to oxidative stress and peroxidative damage[22].

The body weight of animals of only aqueous Neem leaves extract treated group D, gained weight same as weight gained in animal of group A. This study is simililar with the Oluwole B. Akinola when Azadirachta indica was given at 500 mg/kg body weight orally in diabetic rats for the treatment of intestinal lesions[23]. Chavan also observed weight gain when Neem leaves extract were used for hepatoprotective activity against Alcohol induced liver injury in rats[24].

In animals of erythromycin treated group B, the rise in absolute and relative weight of liver was because of drug toxicity. According to Robert R, Maronpot, administration

of phenobarbital in rats causes hepatotoxicity with raised liver weight due to hyperplasia, enlarged lysosomes, hepatocellular hypertrophy and widening of the hepatic blood space inducing P450 enzymes inducers leads to hepatocellular hypertrophy through smooth endoplasmic reticulum proliferation[25]. This is similar with the study of Xiaoyan Lu, who described the increased in relative weight and absolute liver in animal after administration of erythromycin. According to him, erythromycin induces liver toxicity in both human and experimental animals and it leads to disturbance in energy metabolism, lipid and nucleotide metabolism which may attribute to erythromycin toxicological effect on liver through oxidative stress[26]. In group C animals after the treatment of erythromycin and Neem extract, the absolute and relative liver weight reduced when compare with erythromycin treated group B animals. This is because of less inflammatory changes and less necrosis due to the antioxidant property of Neem leave extract which is accordance to observation of Nassr-Allah H, who observed decreased in animal liver weight with administration of erythromycin and Neem leave extract together[18,27].

In group D animals which was given only Neem leaves extract the absolute and relative liver weight was not increased when compared to group A rats. This is because of Neem leaves (Azadirachta indica) have antioxidant effect due to it component nimbidin. Similar effect was observed by Raizada who documented, orally administered Neem extract in dose of 500, 1000 and 1500mg/kg /day did not found any toxicity and changes in absolute and relative liver weights[28].

In present study, the animals treated only with Neem extract showed ameliorated effect on liver. This is a confirmation of SO innih who reported the activity of Neem extract on liver, the study established that crude extract of aqueous Neem (Azadirachta indica) in considerable amount does not prove any hepatotoxic effect neither any cholestotic effect at 250, 500 or 750mg/kg body weight doses administered for 28 days[29]. In contrast, Ashafa observed hepatotoxic effect of ethanolic extract of azadirachtica indica stem bark in male Wistar rats in dose dependent manner, however the aqueous Neem extract was not harmful to liver[30].

The present study evaluates the protective effect of Neem leaves extract on erythromycin induced hepatotoxic effect on rats.

Azadirachta indica have been showing important health-promoting results because of its immense antioxidant potential. Previous studies have documented that Neem leaves and its compounds has played an important role in the inhibition of disease pathogenesis[31].

CONCLUSION:

This recent study determined that erythromycin has hepatotoxic effects on rats. The animals weight changes produced by the erythromycin were finely improved by Azadirachtiac indica (Neem). Aqueous Neem leave extract is powerful antioxidant because of this it acts as a hepatoprotective agent.

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Original Article

Assessment Of Hearing Status In Rickshaw Drivers Of Karachi

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Objectives: To assess the hearing status of the rickshaw drivers of metropolitan city of Karachi.

Study Design: Cross sectional study.

Methodology: A total of 128 rickshaw drivers with minimum experience of two years were selected and pure tone audiometry was performed to assess hearing status. Data gathered through structured questionnaire after verbal and written consent. History was taken regarding ears and hearing followed by local examination of both ears in each subject to rule out the presence of wax or any otherabnormality.

Results: The average age of the participants was 46.25±15.20 years. The mean driving experience was 14.88 ± 6.27 years. Out of 128 rickshaw drivers, hearing impairment was observed in 112 (87.5%) cases while only 16 (12.5%) had normal hearing. Only 7 (5.47%) drivers were using any protective device due to excessive exposure to noise. Rickshaw drivers are exposed to excess noise on roads in Karachi and most of themare suffering from noise induced hearing loss. Secondly most of them are unaware and ignorant about this problem and do not use any protective measures.

Key Words: Occupational noise, Professional hazard, Hearing status, Pure tone audiometry.

INTRODUCTION:

Excessive exposure to occupational noise results in impaired hearing and is now recognized as a potential professional hazard which is an uprising problem on a global scale[1]. For improved social and economic development, a disease-free environmentand worker's health is essential. Noise has become a growing concern as a workplace hazard andit is one of the chronic health concern that not only causes gradual impairment but also disturbs the quality of life of the patient[2].Globally, occupational noise results in 16% of the disabling hearing loss in adults[3] and in USA more than 28 million persons are suffering from occupational hearing loss[4]. Sweden spend approximately 100 million dollars annually for hearing impairment compensations and to provide risk free environment for workers[5]. The average cost per hearing loss claim has been calculated by the Canadian compensation board to be 14000 Canadian dollars[6].

Unfortunately, there is no well-defined legislation and comprehensive regulations in Pakistan except Pakistan National Environmental Quality Standards (PEQS) which deal with motor vehicle noise and permit the maximum noise emission limit of 85 dB[7]. A study conducted in Pakistan shows that prolonged exposure to noise for upto 8-12 years results in noise induced sensory neural hearing loss in workers[8].Environmental noise is the major offender of hearing loss and also a very common environmental stress factor in the developed industrial cities[9]. To the best of our knowledge, no national survey has been conducted to date for the assessment of noise level in metropolitan cities of developing countries. Nevertheless, random studies in different cities have shown that the noise level is much greater than the acceptable limits in most of areas, approximately as high as 70 - 90dB[7]. There is very limited scientific data regarding prevalence, severity, level of noise exposure and degree of hearing loss due to occupational exposure to noise in Pakistan[10].

The aim of this study is to assess the hearing status in rickshaw drivers who belong to a metropolitan city of Karachi.

METHODOLOGY:

A cross-sectional survey was conducted on 128 rickshaw drivers from different areas of Karachi city. Study was conducted from July 2016-August 2016.After the approval of study protocol by research and ethical review board, written informed consent was taken from each participant.

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Received: 11-09-18
Accepted: 08-11-18

A detailed history was taken regarding ears and hearing problem followed by local examination of ears, which was carried out in each subject to rule out the presence of wax or any abnormality like perforation in tympanic membraneetc. Interview based on a structured questionnaire was conducted. All the questions were asked, and responses noted down in detail by senior RMOs. Afterwards, pure tone audiometry was performed on all the selected subjects.

The inclusion criterion for this study was drivers of rickshaw having minimum of two years of experience in Karachi city. The exclusion criteria were subjects with any middle ear disease like, chronic suppurative otitis media, otitismedia with effusion, ear wax, tympanic membrane perforation or otosclerosis, subjects having previous history of head or ear trauma and use of hearing aids because of any reason.

Collected data was entered and analyzed using SPSS software version 17. Frequencies and percentages were computed for categorical variables and analyzed using chi-square test while mean and standard deviation were computed for quantitative variables and analyzed by test and analysis of variance. P-value of <0.005 was considered as significant.

RESULTS:

A total of 128 rickshaw drivers were enlisted for this study and all were males (100%). The mean age of the participants was 46.25±15.20 years, the range being 16 to 70 years. Regarding duration of driving, 42 (32.81%) had 2 to 10 years of experience, 58(45.31%) had 11 to 20 years of experience and 28(21.88%) had more than 20 years of experience.The mean driving experience was 14.88±6.27 years with range of minimum 2 years and maximum 25 years. Most of the rickshaw drivers were driving for more than 8 hours a day and 6 and 7 days per week.

There were 83(64.8%) drivers suffering from different problems related with hearing while 45 (35.2%) had no complaint related with hearing (fig 1). Among these 83 drivers, 10(7.8%) were complaining of ringing in the ears, 16(12.5%) had difficulty in hearing during the mobile phone usage, 41(32%) had difficulty in communication in one to one conversation and 16(12.5%) had difficulty in understanding in the presence of background noise (fig. 1).There were 61(47.7%) drivers who responded that they were facing these problems since they have been employed but had not undergone any hearing tests. Ten (7.8%) drivers responded about being examined and hearing assessment done by the doctor in the past.

On pure tone audiogram, out of 128 rickshaw drivers, hearing impairment was detected in 112 (87.5%) cases while only 16 (12.5%)were not suffering fromany hearing impairment. 17 (13.3%)had mild impairment, 32(25%) had moderate, 19 (14.8%) had severe and 12 (9.6%)had profound impairment in both ears (Table 1). There were 3 (2.3%) cases, who had mild hearing impairment in left ear and severe hearing impairment in right ear and 7 (5.5%) had

Hearing loss	Duration of rickshaw driving in years								
	Right Ear				Left Ear				
	2-10	11-20	>20	Total	2-10	11-20	>20	Total	P-Value
No Impairment	16 (38.1%)	3 (5.2%)	3 (10.7%)	22	13 (31%)	3 (5.2%)	0 (0%)	16	
Mild	14 (33.3%)	7 (12.1%)	0 (0%)	21	17 (45.5%)	6 (10.3%)	0 (0%)	23	
Moderate	6 (14.3%)	29 (50%)	3 (10.7%)	38	6 (14.3%)	26 (44.8%)	7 (25%)	39	0.005
Severe	3 (7.1%)	19 (32.8%)	13 (46.4%)	35	3 (7.1%)	16 (27.6%)	3 (10.7%)	22	
Profound	3 (7.1%)	0 (0%)	9 (32.1%)	12	3 (7.1%)	7 (21.1%)	18 (64.3%)	28	
Total	42	58	28	128	42	58	28	128	

Table 1: Comparison of hearing impairment in each ear with duration of driving experience

Hearing loss	Awareness about the ill effects of noise				
	Right Ear		Left Ear		
	Yes	No	Yes	No	P-Value
No Impairment	10	12	7	9	
Mild	3	18	3	20	
Moderate	0	38	0	39	0.005
Severe	0	35	0	22	
Profound	3	9	6	22	
Total	16	112	16	112	

Table 2: Comparison of hearing impairments in each ear with or without awareness about the ill effects of noise health

Hearing loss	Use of protective devices				
	Right Ear		Left Ear		
	Yes	No	Yes	No	P-Value
No Impairment	4	18	4	12	
Mild	3	18	3	20	
Moderate	0	38	0	39	0.005
Severe	0	35	0	22	
Profound	0	12	0	28	
Total	7	121	7	121	

Table 3: Comparison of hearing impairments in each ear with or without use of protective devices

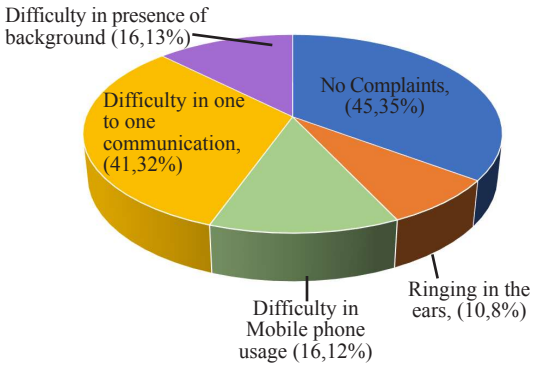

Fig. 1 Complaints regarding hearing in all participants (n = 128)

moderate hearing impairment in left ear and severe hearing impairment in right ear. There were 3 (2.3%)caseswho had moderate hearing impairment in right ear and severe hearing impairment in left ear. Profound hearing impairment was detected in the left side ear in 13 (10.2%) persons.Among these 13 cases 4 (3.1%) had slight, 3 (2.3%) had moderate and 6 (4.7%) had severe hearing impairment in right side. There were 6 (4.6%) cases who had only left ear hearing impairment in which 3 (2.3%) had slight and 3 (2.3%) had profound impairment while hearing impairment in only right ear of the rickshaw drivers was not observed in any case.

Table 1 compares the degree of hearing loss in each year with duration of experience as rickshaw driver. More driving experienced persons had more severe impairment which shows high association of experience and noise exposure (p=0.005).

There were only 16 drivers (12.5%) who were aware about ill effects of noise on health such as hearing loss, headache, depression etc. and only 7 (5.47%) out of 128 participants were using some protective device in the presence of excessive noise. Table 2 shows the degree of hearing loss in each ear in persons with or without this health awareness. It depicts that no impairment was significantly high in those cases who had awareness about ill effects of noise on health.

Use of protective devicesis associated with less hearing impairment. It was observed that, severity of hearing impairment of rickshaw drivers was significantly high in those drivers who did not use protective device as compare to those who used protective device (p=0.005) as show in table 3.

DISCUSSION:

Noise induced hearing impairment is the most dominant, leading and avoidable work-related disease in many developing countries[11]. Furthermore, occupational noise is the commonest cause of noise induced deafness in adults[12]. Exposure to high intensity sound may initially cause temporary hearing loss but later permanent hearing loss occurs. Severity of deafness depends upon on the exposure time, sound intensity and upto some extent frequency of the sound. Karachi is a enormous mega city with a total length of all the roads approximately 8,000 km with around 1.8 million vehicles which is growing with 9% increase per year[13].

Rickshaw is a very common cause of occupational hearing impairment specially in the metropolitan city of Karachi[14].A rickshaw is a three-wheeled taxi which has a pair of stroke engine for two passengers, which is used widely all over Asian countries due to its cheaper fare rates. In Karachi, rickshaw drivers remove rickshaw silencers to gain extra mileage. It has a noise level of 90dB inside the vehicle. Karachi being one of the largest city of Pakistan has a big population of rickshaws in it where 49% of whole country's rickshaws are present and approximately 70,000 rickshaws are registered in this city. Many a times rickshaw drivers use low grade fuels due to which much noise and harmful gases are emitted. These rickshaw drivers are exposed to heavy noise throughout the working hours along with heat, smoke, body vibration etc. It is generally accepted as a fact that excessive noise exposure and hearing loss are inter-related, and this fact is supported by various epidemiological studies which compared the prevalence of hearing impairment in different categories of occupations, particularly in noisy occupations[15,16]. The mean age of the participants in our study was 46.25±15.20 years while a similar study byAslam et al[9] in metropolitan city of Lahore, mean age was 41.35 years.

A similar study done on rickshaw drivers of Karachi found hearing impairment in 81.1% of the drivers included at higher frequencies[17]. In our study we also found hearing impairment in majority of the rickshaw driver. 87.5% of the drivers had hearing impairment in the left ear and 82.8% had impairment in the right ear in our study. The mean rickshaw driving experience in both these studies were also similar ie. 13 years in other study and 14.88 years in our study. Both these studies clearly show strong association of hearing impairment with rickshaw driving.

The effect of noise is not only limited to the drivers and passengers only, rather it also effects the residents and workers around the busy roads and streets. A study conducted recently in Karachi where 5 spots were selected, and sound levels were recorded between 100 to 110 dB throughout the day[18]. Hearing assessment was done among 125 cases who are residents and workers in these areas. It showed an alarming situation where only 17.6% had normal hearing and all others have hearing impairment from mild to moderately severe in nature. Another study from Karachi also showed similar resultswhere maximum peak noise level was found over 101 to 110 dB in different areas[19]. Many other studies had been done on noise induced hearing impairment in the metropolitan city of Karachi related with noise of traffic, industries, aviation, shipyard etc[20-25]. A very interesting study was conducted in Lahore where they

compared simple reaction time in response to some sound stimuli in rickshaw drivers and control group[26]. This study concluded that noise exposed rickshaw drivers take more time to respond to auditory stimuli than control group. A study in Iran on professional drivers showed 37.5% having hearing loss in the right ear and 41.8% of the drivers having hearing loss in the left ear in one or more frequencies of sound[26]. Noise induced hearing impairment has the highest incidence in different countries of the Asia where most of these countries are developing[28].

Another important aspect of this study was the awareness of rickshaw driver related with the ill effects of noise on health. There were only 16 drivers (12.5%) who were aware of these ill effects and majority are ignorant about this very important health related issue. Similarly, only 7(5.47%) participants out of 128 used protective devices in the presence of excessive noise. So, there is strong need to educate these drivers and general public about the hostile and unfriendly effects of noise on health. There is also difference in hearing loss in right and left ear because of different exposure to sound during driving depending upon the right or left hand driving rules of the country[29]. This is not applicable on rickshaw which is open from both sides and there is equal exposure to noise on both ears. But in contrast, in our study 22 drivers had normal hearing on right side while only 16 had normal hearing in left ear which means left side is more affected than right.

If noise exposure can be reduced, then it will also decrease the tendency of drivers to cause accident and injury.If the driver is unable to hear auditory warning signals, then appropriate action cannot be taken in time by themand may result in accident. The noise exposure torickshaw drivers is thus interfering with the safety of driver daily life, asin presence of excessive noise, warning signals or horns from other vehicles may not be heard. Periodic assessment of rickshaw drivers for detecting any hearing loss at initial level should be done. Use of protective devices should be encouraged through workshops etc. There should also be periodic assessment of rickshaws and other vehicles for noise and engine parameters.

CONCLUSIONS:

Rickshaw drivers are exposed to excess noise on roads in Karachi and most of them are suffering from noise induced hearing loss. Secondly most of them are unaware and ignorant about this problem and do not use any protective measures.

CONFLICT OF INTEREST:

None

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Original Article

Open Reduction And Internal Fixation Of Ankle Fractures - Is Timing Of Surgery Important?

Faaiz Ali Shah, Mian Amjad Ali, Sajid Akhtar, Abbas Ali

ABSTRACT:

Objective: To determine the frequency of surgical site infection in ankle fractures fixed earlier or delayed.

Methodology: This retrospective cohort study was conducted in the department of Orthopaedics and Traumatology Lady Reading Hospital Peshawar from March 2016 to August 2018. The medical records of all the patients with ankle fractures fulfilling the inclusion criteria were analyzed retrospectively. Demographic details of the included subjects, time of surgery and frequency of surgical site infection was noted.

Results: A total of 128 patients with mean age 38.8 years± SD 9.76(range 18-58 years) were included in our study. Male patients were 99 (77.3%) while female were 29 (22.6%). The number of patients who had open reduction and internal fixation (ORIF) within the initial 24 hours after sustaining the fractures were 12 (9.3%) in number,58(45.6%) patients had surgery in 24 to 48 hours, 40 (31.4%) in 3 to 7 days and 18 (14.1%) had surgery in 8 to 14 days after the injury.The frequency of surgical site infection(SSI) was 42.5% (17/40) in patients operated in 3 to 7 days, 44.4%(8/18) in patients operated in 8 to 14 days while no surgical site infection was reported in 54.6% (70/128) patients operated in 24 to 48 hours. (P value < 0.05).

Conclusion: The timing of ankle fracture surgery is very important. Open reduction and internal fixation of ankle fractures done earlier had no surgical site infection. Delayed fixation is associated with higher frequency of surgical site infection.

Key Words: Ankle fracture, open reduction and internal fixation(ORIF),surgical site infection(SSI)

INTRODUCTION:

Ankle fractures accounts for about 10% of all the fractures[1]. Open reduction and internal fixation(ORIF) of ankle fractures give better results than non operative treatment[2,3]. The most common complication of ankle fracture surgery is surgical site infection(SSI) which inhibits fracture union and adversely affect the functional outcome of the ankle joint[4,5]. Patients with surgical site infection have prolonged hospital stay and frequent re admission rates[6]. The reported frequency of surgical site infection after open reduction and internal fixation of ankle fracture in literature is 1.4% to 13.0% with superficial infection accounting for 3.0% to 10.0% and deep infection 1.0% to 6.8%[7-9]. Various risk factors like older age, obesity, smoking, diabetes and increase operating time have been identified to be associated with increase surgical site infection after ankle fracture surgery[7,10] but the effects of delay in surgical timing on the frequency of surgical site infection is not yet clear[11]. Some studies[12,13] reported no relationship between timing of surgery and surgical site infection while others[11,14] documented an increase frequency of surgical site infection in patients who were operated late. The surgical outcome of ankle fractures have been addressed by many studies in our set up but unfortunately their main focus was either on functional outcome, length of hospital stay or cost and no study could evaluate the effects of delayed surgery on the frequency of surgical site infection. The objective of this study was, therefore to retrospectively document the frequency of surgical site infection in ankle fractures fixed earlier or delayed. Our hypothesis was that the frequency of surgical site infection would be lower in fractures if fixed earlier than delayed. The results of our study will help us not only in preoperative counseling of the patient or his family but also help us in formulating standard guidelines for managing ankle fractures in our set up.

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Received: 27-08-18
Accepted: 07-12-18

METHODOLOGY:

Our study was a retrospective Cohort study conducted in the Department of Orthopaedics and Traumatology Lady Reading Hospital Peshawar. The research protocols were approved by the Ethical Review Board of the hospital before the commencement of our study. The medical records of all the patients who had ankle fracture surgery (open reduction and internal fixation) in our department from March 2016 to August 2018 was retrospectively analyzed. Adult patients (18 years and above) of closed ankle fractures with complete medical records and radiographs were included in the study.

Patients with calcaneus, talus or tarsal bone fractures, pathological ankle fractures, other associated fractures requiring surgical intervention and ankle fractures of more than two weeks old were excluded from the study. The demographic variables of the included subjects like age, gender, side of injury, mechanism of injury, fracture type, time duration between the injury and surgery were noted. Pre-operative x rays were examined and fractures were classified according to Weber classification for ankle fractures[15]. The record showd that a uniform standard surgical protocol of open reduction and internal fixation(ORIF) was adopted for all the patients. All the surgeries were performed by the same surgical team with an experience of more than five years in foot and ankle surgery. General or spinal anaesthesia was used for surgery. Pneumatic tourniquet was used in all cases. Preoperative antibiotis (Inj Ceforuxime 1.5 gm) was given to all the patients. The operation notes indicated that depending upon fracture type, an adequate skin incision was used to fix the fibula first with appropriate length of 1/3 tubular plate while malleolar screws and K-wires were used to fix medial malleolus. Syndosmotic screw was used in cases of syndosmotic disruption. Posterior malleolar fracture was fixed with cancellous screw when indicated. The wound was closed in two layers with vicryl and polypropylene suture material. Post-operative x-rays were seen to confirm types of implant and adequacy of fracture reduction. All the patients were discharge home on the second or third post-operative day with intravenous antibiotics (Ceforuxime 1.5 gm twice daily) for three days and backslab to the foot and leg. At two weeks follow up stitches were removed and back slab discontinued. From the follow up records details of onset of surgical site infection, antibiotic use and wound dressing, culture and sensitivity reports, readmission and resurgery rates were recorded. Surgical site infection(SSI) was classified according to the Center for Disease Control(CDC) guidelines[16]. The medical records of the infected patients were checked in detail and infection of the skin and subcutaneous tissues indicated by inflammation of the incision site was classified as superficial surgical site infection while infection of the muscles and fascia with discharge, abscess or dehiscence was classified deep surgical site infection[9]. The data collected was analyzed with computer software SPSS(version 21). Continuous variables like age and time of surgery was represented as mean ±Standard deviation. Categorical variables like gender, type of fracture and fracture side was represented as frequency and percentages. Frequency of surgical site infection in early and delayed groups were compared and *P* value was considered significant if < 0.05. Data presented in graph and table where necessary.

RESULTS:

The medical records of 128 patients were reviewed. The mean age of these patients were 38.8 years± SD 9.76(range 18-58 years).Majority(77.3%,n=99) of our patients were male while female were 29(22.6%).Right ankle was fractured in 74(57.8%) patients and left in 54(42.1%).The fracture demography of our patients are shown in table 1. Open reduction and internal fixation(ORIF) of 12(9.3%) patients were done within the initial 24 hours of sustaining the fracture while 58(45.6%) patients had surgery in 24 to 48 hours,40(31.4%)in 3 to 7 days and 18(14.1%) had surgery in 8 to 14 days after the injury. Surgery was done under spinal anaesthesia in majority(71%,n=91) of patients while general anaesthesia was given to 37(28.9%) patients. Overall surgical site infection was noted in 25(19.5%) patients. Patients operated in 24 to 48 hours(54.6%,n=70) had no surgical site infection while 17(42.5%) patients operated in 3 to 7 days and 8(44.4%) patients operated in 8 to 14 days developed surgical site infection(*P* value < 0.05)as shown in graph 1.Superficial surgical site infection was reported in 16(64%) patients and deep infection in 9(36%) patients. All patients with superficial surgical site infection were treated with local wound care and oral antibiotics. Culture and sensitivity reports documented Staphalocoocal aurus in 7(28%) patients and mixed micro organisms in 5(20%) patients. Re-admission and debridement under anaesthesia was noted in 7(28%) patients with deep infection. Implants were not removed in any patient. All patients eventually healed. No in- hospital mortality was recorded.

Aetiology	Number of patients	Percentages
Motor vehicle accidents	64	50%
Fall	46	35.9%
Sports injury	18	14%
Weber type I	22	17.1%
Weber type II	65	50.7%
Weber type III	41	32%

Table I: Fracture demography of our patients

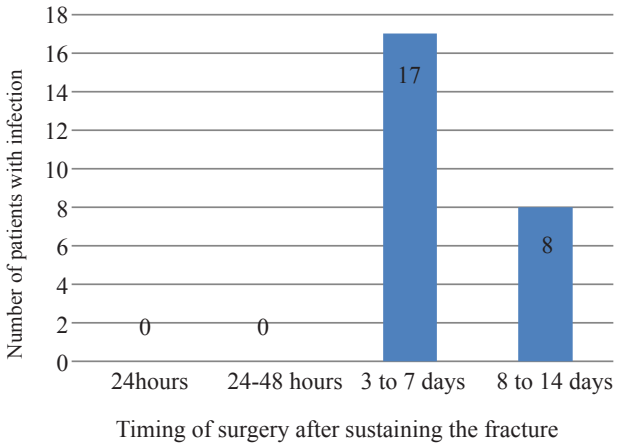

Figure 1. Timings of surgery and the frequency of surgical site infection in patients with open reduction and internal fixation of ankle fractures.

DISCUSSION:

The medical record of 128 patients of open reduction and internal fixation of ankle fractures indicated that no surgical site infection was noted in 54.6%(70/128) patients who were operated in 24 to 48 hours while 42.5%(17/40) patients who were operated in 3 to 7 days and 44.4% (8/18) patients operated in 8 to 14 days developed surgical site infection. Similar to our findings Schepers[11] reported no infection in 60(29.2%) out of 205 ankle fractures operated within 24 hours while 16(11%) out of 145 fractures developed surgical site infection.(p=0.004) who were operated after 24 hours of sustaining the fractures. Saithna and Moody[14] reviewed the records of 85 patients of ankle fracture surgery. They found that the frequency of wound infection in patients who had surgery after 6 days was significantly higher than those operated earlier(3.6% vs 20.7% , *P*=0.01) Another study reported no infection in 24(38.7%) out of 62 patients operated within 24 hours while 6(15.7%) out of 38 patients developed infection who were fixed after 24 hours.[17] Adamson 18 noted infection rate of 1.4%(1/67) in patients fixed within 24 hours and 9.5%(8/84) in patients operated after 24 hours(*P*=0.04) Contrary to our observations, some researches however, reported no relationship between the timing of surgery and infection rate in ankle fracture surgery. This might be due to the differences in study designs, included subjects and evaluation of risk factors. Pietzik and Qureshi [19] reported no surgical site infection in 62 patients who were operated within 48 hours while only one patient out of 21 developed infection who were operated after 48 hours. The difference however, was not statistically significant. Miller[12] reported an infection rate of 4.1% after 478 ankle fracture surgery but no relationship between the timing of surgery and complication rate was found. Thangarajah and Prasad [9] reported an infection rate of 24% in ankle fracture surgery, but no statistically significant association was found between timing of surgery and infection rate. (*P*= 0.51). Singh[20] treated 82 patients with ankle fracture in less than 24 hours after sustaining the fractures and 132 patients more than 24 hours and noted infection rates of 7% and 11%(*P* =0.589) respectively. One of the largest series of ankle fracture surgery of 1011 by Naumann and Sigurdsen[21]reported no statistically significant association between the wound complication rate and early or delayed surgery. They observed a safe pre-operative period of 6 days in which the patient can be optimized and surgery can be planned without an increase in frequency of surgical site infection. Sukeikh and Qaffaf [22] reported infection rate of 4.2% (5/117) in early surgery group (24 hours) while 14.2%(4/28) in delayed group (*P*=0.07) There are some limitations of our study. The design of our study was retrospective rather than randomized control trial which would have been statistically more powerful. The precise reasons for delay in surgery could not be evaluated but in our setup the usual causes for delay are late presentation of the patients to the hospital, patient initial refusal for surgery, soft tissue swelling, shortage of operation theatre and patient preparation for anaesthesia. The role of some important risk factors for surgical site infection like obesity, diabetes, operating time and smoking could not be assessed. Furthermore documentation of frequency of surgical site infection by different surgeons in the follow up period might resulted in underestimation or over estimation of surgical site infection.

CONCLUSION:

The timing of ankle fracture surgery is very important. Open reduction and internal fixation of ankle fractures done earlier had no surgical site infection. Delayed fixation is associated with higher frequency of surgical site infection. Time of surgery is a factor which can be control by the surgeon resulting in lower surgical site infection. We therefore recommend that ankle fractures should be fixed within 24 hours of sustaining the fractures.

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Original Article

Feasibility And Efficiency Of Ureterorenoscopy As A Day-care Procedure For Treatment Of Ureteric Calculi

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ABSTRACT

Objective: To assess the feasibility and efficiency of ureterorenoscopy as a day-care procedure for treatment of ureteric calculi in order to reduce their heavy workload and to spare resources for reducing long waiting list of elective advanced urological surgeries for patients admitted as an indoor category.

Study design: Prospective descriptive study.

Place and duration of study: The study was conducted in Urology department of PNS Shifa, Karachi from July 2017 to March 2018.

Methodology: All patients who presented to our institute for ureteric calculi with normal creatinine and no urosepsis were included in the study. The ureterorenoscopy procedure was carried out either in spinal anesthesia or general anesthesia using laryngeal mask. Post-operative outcomes criteria for feasibility were assessed as 'rate of complications that required admission in the hospital'.

Results: A total of 164 patients underwent ureterorenoscopy. Out of these 151 successful ureterorenoscopy procedures for urolithiasis were performed with 98% stone clearance. Majority of patients went home the same day with no sequel, only twelve patients were kept for a day or two for minor complications. Nine of these had severe pain postoperatively requiring parenteral analgesia and were discharged on first postop day. Three had developed fever and were discharged on second postop day. No confounding factors were found to predict the readmission event.

Conclusion: A day care ureterorenoscopy is a safe procedure in a full time day care setting, with a rapid turnover and clinically safe outcome with few and trivial complications requiring readmission.

Key Words: day-care, outcome, ureterorenoscopy, ureteric calculi.

INTRODUCTION:

Ureterorenoscopy was first introduced in 1980 for diagnostic and therapeutic purposes[1]. With advancements in optics and lithotripsy mechanics, the procedure was refined and a wide range of ureteric pathologies were targeted. Narrow caliber scopes and additional accessory mini instruments[2] led to improvement in postoperative outcomes including rapid recovery and minimal postoperative sequel[3-5].

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Received: 17-08-18
Accepted: 23-11-18

For treatment of ureteric calculi, Extracorporeal Shock Wave Lithotripsy (ESWL) and ureterorenoscopy have been compared for efficacy in terms of stone clearance and complication rates[6,7]. Ureterorenoscopy for upper and middle ureteric calculi has 90-96% and 92-97% stone clearance rate respectively[8-10] however, it is the treatment of choice for lower ureteric calculi with 100% stone clearance rate by 2nd postop day[11,12].

ESWL does not require anesthesia but the immediate stone clearance rates are not comparable to ureterorenoscopy because there is delayed or prolonged stone clearance time, sometimes up to 4 months and that too with multiple ESWL sessions[13,14]. These factors lead to poor patient satisfaction rates and a compromised life style and comfort during the whole experience of the treatment sessions with ESWL. On the other hand ureterorenoscopy for upper and mid ureteric calculi although requires anesthesia (spinal or general)[15-19], do take the lead over ESWL as immediate patient satisfaction is almost 95 to 100%[20-22] and that it saves multiple interventions, surgeons' time and effort as well as over utilization of facility.

Ureterorenoscopy had been generally performed in an indoor settings but discharging the patient on the same day as outcome measure, has led to the feasibility of converting it as a day care procedure in various settings where ever it has been objectively studied multiple times. In all these evaluations 68 to 100% patients were discharged the same

day leading to the possibility of converting the facility into a day care setting [3,4]. However, with regard to converting it into a complete outdoor procedure the outcome analysis must be documented in order to prevent unnecessary burden on the patient and the hospital indoor capability.

Our institute is among the heaviest workload laden urology center. There is very high turnover of patients with comparatively limited indoor space resulting in constrained admissions. In this study we assessed the possibility of performing the ureterorenoscopy as a day care procedure after analyzing the readmission rates and frequency of complications.

METHODOLOGY:

This prospective descriptive case series review included patients undergoing ureterorenoscopy in Urology department of PNS Shifa, Karachi from July 2017 to March 2018. All those patients who presented with ureteric calculi were evaluated for day care procedure. Those presenting with urosepsis, raised creatinine, solitary kidney and significant co-morbidity were excluded from the study. A complete preoperative work up included baseline blood tests and CT-KUB (plain) for stone evaluation. The surgery was performed in a dedicated day care unit from 0800 to 1500 hrs. Patients were discharged from the day care unit after 4 to 6 hours post-operatively. All procedures were carried out by experienced urologists who had performed more than 500 ureteroscopic procedures. An 8 Fr semi-rigid ureterorenoscope with 02 channels was used in all cases. A perioperative antibiotic and a ureteric safety guide-wire were considered mandatory. A stone cone was used to prevent the proximal migration of the stones. The stones were broken with lithoclast and retrieved with graspers or Dormia basket. DJ stents placement was left at the operator's discretion. Postoperatively the patients were monitored for pain, hematuria and fever. They were kept on oral antibiotics and analgesics for 3 days.

Patient demographics, stone size and location, DJ stent placement, stone clearance (estimated by postoperative X-ray KUB), completion of procedure and post-operative complications were recorded. Those who required prolonged hospital stay, the reason and duration of indoor stay were also recorded. The data was analyzed by SPSS version 22.0.

RESULTS:

A total of 164 day care ureterorenoscopic procedures were performed for ureteric stones (137 males and 27 females, mean age 34 years, range 14 to 70). In 13 procedures ureters were not negotiable and they were stented with DJ stent under fluoroscopic guidance. 151 successful ureteroscopic procedures were performed; the size, number and the location of the stones are shown in Table 1. Out of 151 patients 135 patients had stone clearance during the primary procedure accounting for immediate clearance rate of 90%. Difficult ureter was encountered in 13 patients for which placing a DJ stent and a successful ureterorenoscopy was possible after 3 weeks.

Twelve patients were kept for more than 24 hours and were shifted to the indoor facility from day care (Table 2). Nine of these had severe pain and vomiting postoperatively requiring parenteral fluids and analgesia. Six out of nine were those in whom DJ stent was not placed. They were discharged next day. Three had developed fever which required parenteral antibiotics for 3 days after which they were discharged on oral antibiotics. From among the total of 164 cases 16 cases having upper ureteric calculi the stone was pushed back into the kidney and a DJ stent was placed; these were dealt with ESWL later on. Record was evaluated to detect reasons predictive of delayed recovery (Table 3). Placement of DJ stent was found to be of value in preventive severe pain and vomiting requiring admission.

DISCUSSION:

Day care procedures or ambulatory surgery where patient does not stay in the hospital overnight due to rapid post-operative recovery has reduced the overall cost for the said surgeries. Ureterorenoscopy is one of very few urological procedures which have been considered for the day care setting due to its short operative time and quick post-operative recovery.

In our study the adequacy of URS for the ureteric stones in our day care setting was efficiently demonstrated. Out of 164 cases over all stone clearance was 90%. Ten percent were those with upper ureteric calculi in which partial stone breakage was achieved along with the stone being pushed back into the kidney. These required ESWL in later setting. In cases of middle and lower third ureteric calculi complete stone clearance was 100%. The findings concur with other studies where stone clearance rates for middle and lower third ureteric calculi were 91 to 96% [23-26].

Twelve patients were kept for more than 24 hours and were shifted to the indoor facility from day care. Nine of these had severe pain and vomiting postoperatively requiring

Stone size	***Number of stones***
Stone size (mm)	
< 5	16
6-10	92
>10	56
Radiolucent	30
Location	
Left / Right	81 / 83
Ureteric site	
Upper	29 (18%)
Middle	52 (32%)
Lower	83 (50%)
TOTAL	**164**

Table-1 Size Number and location of the stones.

Reason for admission	No of Patients	Procedure	Inpatient Treatment	Duration of admission (days)
Pain and Vomiting	9	No DJ stent was placed	IV fluids and opioid analgesics	2
Fever	3	Stones larger than 10mm	IV antibiotics for 3 days	3

Table-2. Cause of admission of Day care patients and their management.

Factor	*Not admitted*	*Admitted*
Number	152	12
Mean (range) age, years	34 (14-64)	39 (23-70)
Peri-operative antibiotics	All	All
No DJ placed	8	9
Large stones(>10mm)	53	3
Median(range) operative time, mins	28 (16-45)	31 (17-48)

Table-3. Predictive causes of delayed recovery.

parenteral fluids and analgesia. All of them were without DJ stent postoperatively. They were discharged next day on oral analgesia. Three had developed fever which required parenteral antibiotics for 3 days after which they were discharged on oral antibiotics.

In our study the rate of readmission as an indoor case has been seven percent (12 patients), five percent were due to severe pain and vomiting while remaining two percent were admitted due to fever. Those who presented with severe pain and vomiting were those in whom no DJ stent was placed. In 17 patients out of 164 no stent was placed post-operatively and out of them 9 had severe pain that required readmission. Cheung et al reported higher postoperative pain especially on the 3rd postoperative day in those who were stented with DJ. The pain was also found to be more in females especially on the first and second postoperative days. However, they could not identify any predictive factors for unplanned admission[24]. In our study the male to female ratio was 4:1. Moreover, absence of DJ stent was the cause of the severe pain, which might be due to missed residual fragments impacted temporarily in the ureter. Yip et al reported 2 out of 61 patients (3%) readmitted with severe postoperative pain[23]. Similarly Bromwich et al also reported a successful day care ureterorenoscopy on 64 patients with only 3 patients (4%) admitted postoperatively for pain only. There was also no predictive factors identified for the unexpected admissions[26]. Bloom et al reported readmission rate of 5.8%. These patients were admitted for pain control and all of these were those who were not stented after the ureterorenoscopy[27]. Tan et al also reported a safe and successful day care ureteroscopic procedure with reporting of readmission due to pain in 10% of those cases who had either bilateral procedure, middle and upper ureteric stone clearance or history of psychiatric ailment[28].

In our study, those presenting with fever (2%) were managed conservatively with parenteral antibiotics. All recovered in three days and were discharged on oral antibiotics without any sequel. There was no confounding factor observed for the occurrence of fever. Bloom et al documented 3% incidence of fever requiring readmission. They too could not identify any confounding factors leading to fever. However, antibiotic prophylaxis was mandatory in their set of patients. All the patients were discharged 3 days after with oral antibiotics[27]. Taylor et al found no significant predictors of immediate or delayed admission. They documented infection as the cause of delayed admissions. Those patients who developed complications of infection after ureterorenoscopy (one each with pyonephrosis, PUO and pyelonephritis) received perioperative antibiotics. In the absence of randomized controlled study it cannot be said with assertion that the use of prophylactic antibiotic reduced the complications to what extent precluding readmission although empirically it did prevent complications apparently. This finding agrees with previous randomized controlled trials, where the use of prophylactic antibiotics in endoscopic procedures significantly reduced the complication rates[29].

Technological improvement in ureteroscopes have resulted in negligible morbidity and stone clearance rates up to 100% for middle and lower ureteric calculi. In all patients who fulfill the criteria for local day-surgery, ureteroscopies can be performed as a safe day-care procedure, although less than 12% of these may subsequently require readmission. If social and anaesthetic criteria are fulfilled, there is no urological condition that prevents a day-care ureterorenoscopy. All patients should receive perioperative antibiotics for the procedure. We recommend routine stenting after ureterorenoscopy, as we found the placement of stent to be protective of pain that might avoid readmission. The extra cost and acceptable negligible morbidity resulting from stent placement is insignificant as compared to the added cost and burden of prolonged admission in the hospital.

CONCLUSION:

In spite of general anaesthetic requirement, ureterorenoscopy in expert hands is minimally invasive and offers early stone clearance, with good patient satisfaction and a swift postoperative recovery. Day-care ureterorenoscopy is feasible and cost effective preference in management of ureteric stones.

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Original Article

Hearing Loss Among Excessive Mobile Phone Users; A Cross Sectional Study At Bahawal Victoria And Civil Teaching Hospitals Bahawalpur

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ABSTRACT

Objective: To assess the hearing loss among the subjects using excessive mobile phone.

Methodology: 50 subjects were entered for this study with age ranging from 20 to 40 years using mobile phone for more than 5 years. 25 subjects who used mobile phone for less than (<) 60 min /day formed one group, while 25 subjects who used cell phone for more than (>) 60 min /day formed the second group. The hearing levels of all the subjects were tested using Pure Tone Audiometry (PTA). Duration of mobile phone usage was assessed by questionnaires.

Results: There was a significant increase (*p*-value .00006) in the hearing thresholds at all frequencies in air conduction and bone conduction in right ear in test group compared with the control group. Similar result was found in the left ear except for bone conduction at frequency 4 and 6 (kilo hertz) kHz. Excessive use of mobile phone caused Sensory neural hearing loss and the prevalence was 84% in group who used mobile phone for > 60 min / day and 20% in group who used for < 60 min / day.

Conclusion: Excessive use of mobile phone may cause increase in pure tone threshold associated with the duration of usage. The use for more than 5 years with more than 60 minutes daily can produce harmful effects on human hearing.

Key Words:: Mobile phone, Hearing loss, Hearing threshold, Pure tone Audiometry

INTRODUCTION:

Mobile phone as a communication tool has become an indispensable necessity of our life these days. At the end of 2011 there were 6 billion people using mobile phones calculated by the international telecommunication union which is equal to 87% of the world population and according to this survey Pakistan is 5th in the Asia and 8th in top ten countries worldwide in mobile phone subscribers. The figure of mobile phone users in Pakistan is as much as 131 million.

As compared to the ionizing radiations electromagnetic waves of mobile phones cannot break chemical bonds and damage DNA for being less powerful but these are capable of penetrating the skull and can deposit energy up to 4-6cm deep into the brain. This can result in the increase of tissue temperature up to 0.1°C[1].

Speech frequencies are usually located between 250-8000 Hz. Low frequencies (250-2000 Hz) are hearing noise whereas the high frequencies (2000-8000 Hz) are to understand this[2]. The damage in terms of hearing loss caused by prolonged and persistent noise exposure from chronic mobile use or by electromagnetic waves emitted by the mobile phone is still a matter of controversy[2].

There are various other medical hazards associated with chronic use of mobile phones like dizziness, lack of concentration, skin burns and hypertension[3,4]. Different type of cancers like leukemia, lymphoma acoustic neuroma and brain tumors have also been linked with excessive use of mobile phone[5,6,7]. Neurological diseases like sleep disturbances, epileptic seizures and Alzheimer's disease are also associated in the literature [8,9]. As ear is the closest organ amongst others to the electromagnetic radiations of mobile phone so it has been a source of deep concern and debate regarding the hazardous effects[10,11]. A cohort study on 200 subjects shows significant increase in pure tone thresholds among mobile phone users[12]. While another study states no significant difference in the thresholds of different audiometric tests between the mobile phone users and those who were not exposed to harmful electromagnetic waves of mobile phones. However increasing trends of abnormal thresholds were noted among those subjects who were exposed to the electromagnetic waves of mobile phone for longer duration and time (> 4 years and > 60 minutes / day)[13]. A study on students using mobile phones with 1 to 2 hours exposure per day reveals the development of headache and tinnitus in few ones while students from other group who used

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Received: 27-10-18
Accepted: 13-11-18

mobile phone with duration of 3 to 4 hours per day developed headache tinnitus otalgia and limited high degree of hearing loss[14]. Another study showed, no significant difference was noted in the hearing thresholds between dominant (user) and nondominant (non user) ear[15].

We considered it important to conduct a similar pilot study in our setting and the rationale was to establish a relationship between excessive mobile phone usage and hearing loss.

METHODOLOGY:

A total of 50 subjects from 20 to 40 years of age who did not give any subjective complaint of hearing difficulty or discomfort in the history were included in this study. The sampling technique was non-probability convenience type.

The inclusion criteria was all those subjects who were using mobile phones for more than 5 years after taking informed consent from them. Out of the 50 subjects taken, 25 were those who used mobile phones for more than 60 min / day, placed in one group and 25 subjects who used mobile phone for less than 60 min / day in the second group. All these patients were healthy attendants coming to the ENT Department.

Exclusion criteria were all those subjects who gave history of ?Hypertension, Diabetes Mellitis, use of ototoxic drugs, recent ear nose and throat infection, Noise-induced hearing loss (with history of occupational exposure), smoking, tobacco chewing and any known cardiovascular disease.

A questionnaire was designed and used for data collection. Questions were asked from the subjects according to the proforma after taking their written informed consent. Pure-tone audiometry (PTA) was performed on these subjects in a sound proof room to assess the hearing threshold of each ear. Air conduction thresholds were measured and plotted on a graph for tones of 250, 500, 1000, 1500, 2000, 4000, 6000, and 8000Hz and bone conduction thresholds for 250, 500, 1000, 1500, 2000, and 4000 Hz and an audiogram was achieved after plotting the graph. Bone conduction thresholds were the measure of cochlear function of that side. The difference in the thresholds of air and bone conduction (A-B gap) was a measure of degree of conductive deafness. All the collected data was analyzed by using SPSS version 10 software. Odds ratio was calculated and statistical test of significance (chi square) was applied.

RESULTS:

The mean age among the subjects of group using mobile phone for >60 min /day was 24.2 ± 1.5 years and among those in the group using mobile phone for <60 min /day was 29.2 ± 2.1years. In both the test and control groups male subjects were more than females with 80% in the test and 72% in control group. 83% of the subjects were having right ear dominance than left who were 17 % in both the groups. A significant increase (*p*-value .00006) was observed in the hearing thresholds at all frequencies in air and bone conduction in right ear in the first group subjects who used mobile phone for >60 min / day in comparison with the second group subjects with <60 min / day use (Table 1). Similar significant increase in the thresholds (in db) at all frequencies in air and bone conduction was noted in left ear except for bone conduction at frequency of 4 and 6 KHz

Threshold	**Subjects who use > 60 min/day**	**Subjects who use < 60 min/day**
Normal (<25dB hearing threshold)	4	20
Hearing loss (<25dB hearing threshold)	21	5
Total	25	25

Table 1: Relationship between hearing threshold increase and duration of daily mobile phone use

Frequency in Hz	**Mean Air Conduction** Threshold in db		**Mean Bone conduction** Threshold in db	
	>60 min/day	<60 min/day	>60 min/day	<60 min/day
Left Ear				
250	15.0 ± 3.81	26.4 ± 4.45	9.40 ± 4.44	22 ± 5.05
500	18.6 ± 4.3	28 ± 4.08	13.2 ± 4.17	26.5 ± 6.7
1000	19.8 ± 4.39	29.8 ± 2.69	14.8 ± 3.55	26.9 ± 4.30
2000	17 ± 4.39	26.2 ± 4.71	11.4 ± 4.2	24.4 ± 6.17
4000	17.4 ± 11.02	35.4 ± 4.45	14.60 ± 4.8	29.6 ± 2.3
6000	18.± 8.61	38.8 ± 6.17	15 ± 4.15	32.2 ± 2.53
8000	20.8 ± 4.62	39.8 ± 6.23	NA	NA
Right Ear				
250	14.4 ± 5.46	28.4 ± 4.31	10.0 ± 3.81	24.4 ± 3.33
500	16.4 ± 3.06	29.4 ± 2.62	13.0 ± 2.5	26 ± 3.53
1000	14.6 ± 4.81	31.8 ± 6.13	12.2 ± 2.53	27 ± 4.33
2000	17.2 ± 2.91	33 ± 3.53	13.4 ± 2.5	29 ± 3.81
4000	19 ± 7.2	29.8 ± 7.4	15.4 ± 3.06	24.6 ± 3.90
6000	19.4 ± 9.38	33.8 ± 4.05	16. 6 ± 3.62	28 ± 3.81
8000	24.8 ± 6.09	38.8 ± 7.25	NA	NA

Table 2: Comparison of Auditory thresholds (Air and Bone conduction) between the two groups

Complaints	**Frequency**	**Percentage**
Warm sensation	15	30%
Aural fullness	07	14%
Ringing in the ear	02	4%
No complaint	26	52%
Total	50	100%

Table 3: Associated complaints among the subjects under study

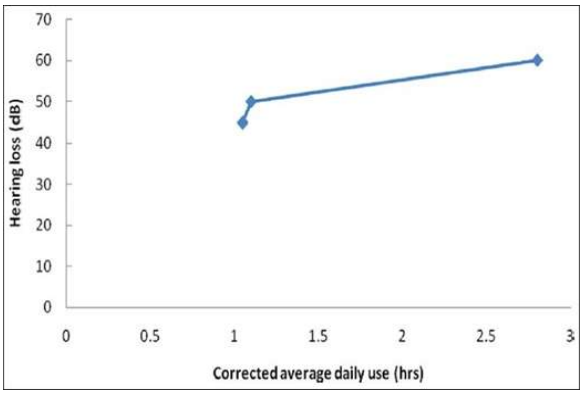

Figure 1. Severity (Degree) of Deafness with daily use of mobile

(Table 2). Three subjects in our study (6%) were found to have moderate to severe sensory neural deafness due to excessive use of mobile phone. First subject was having 45 db hearing loss at 2 KHz with the duration of seven years of mobile phone usage with average of 45 min per day use. Second subject was noted with hearing loss of 50 db at 2 KHz with of 1 hour per day daily use for the last 5.5 years. Third person gave the history of tinnitus and had hearing loss of 60 db at 4 KHz. The mobile phone was used for two hours per day for the period of seven years.

In addition other complaints like aural fullness, warm sensation and ringing sensation were also noted in the long duration mobile phone users (Table 3). The relationship between average use of mobile phone on daily basis and severity of hearing loss was also observed and established (Fig 1). Odds ratio was also calculated which was 21. In other words a person who used mobile phone for more than 60 minutes was 21 times more likely to have increase hearing thresholds than to a person who used mobile phone for less than 60 minutes per day. Chi square test was also applied and calculated value of 20.5 was greater than Critical region of 3.84 so the null hypothesis stating "Mobile phone use for >60 min /day has no effect on hearing threshold" was rejected so it became clear that there was a significant increase in hearing thresholds in the subjects who used mobile phone for >60 minute /day.

DISCUSSION:

Electromagnetic radiations of mobile phone and health issues have been increasingly considered, especially after the remarkable increase in the use of mobile phones throughout the world population. Because of the fact that mobile phones transmit and receive microwave radiations at frequencies of about 900 and 1800 MHz which can excite the rotations of water and organic molecules and eventually attribute to thermal and non-thermal effects[16]. The auditory system, especially the outer hair cells of cochlea, is considered highly sensitive against electric and magnetic fields which can generate some kind of hearing sensation[17].

Specific absorption rate (SAR) is the measure of radiation

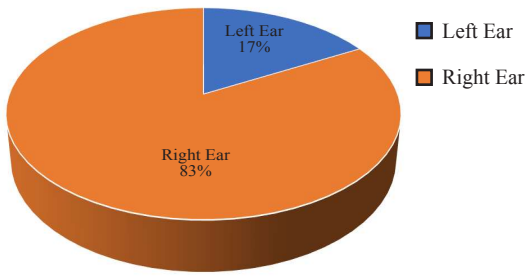

Figure 2. Dominate Ear in Mobile Phone users in Control & Test Group

coming from mobile phone and measured by cellular radiation detectors. By the help of this radiofrequency exposure of mobile phones can be assessed which helps in achieving the safety limits. Because of the closest proximity to the mobile phone, ear is the most susceptible body part for high SAR deposition [18].

The findings of this study are consistent with that of many others mentioned in the literature. Shayani and colleages have found significant increase in the hearing thresholds among mobile phone users comparing with non-users in a cohort study [12]. Another study conducted by Ramaya et al has also shown a significant rise in the hearing thresholds at all frequencies in air and bone conduction for both right and left ear between test and control group except for bone conduction at higher frequencies like 4 to 6 KHz [19]. In a research presented at the American academy of otolaryngology head and neck surgery foundation's annual meeting and OTO EXPO in Washington DC, 100 people who were using mobile phones for period of more than a year developed increasing degree of hearing loss mainly at higher frequencies over the period of twelve months. This study also found that people who had used mobile phones for a duration more than 60 minutes a day were having a worse hearing threshold than those who used less [2].

In one study conducted by Velayutham,Gopala and colleagues in India on 100 subjects assessing high frequency hearing loss among prolonged mobile phone users found significant hearing loss in the dominant ear as compared to the non-dominant ear[20].

In our study there is also significant increase in pure tone thresholds of hearing at nearly all frequencies except for bone conduction at high frequencies in left ear (non-dominant ear). Another study conducted on medical students by Youssef et al establishing the relationship between the excessive mobile phone usage and ear problems, has described statistically significant relationship causing gender specific ear problems like vertigo dizziness and tinnitus [21].

This study also describes some complaints like aural fullness, ringing and warm sensation present in the test group due to long term use of mobile phone along with significant increase in hearing thresholds showing a relationship between mobile

phone use and threshold increase among the subjects using mobile phone excessively. The negative and excessive use of mobile phone by young adults with problematic consequences has also been found by Amita and colleagues in their study at Haryana India[22]. Similar study is conducted in Dow Medical college, Civil hospital and Jinnah Medical hospital Karachi in which medical related issues including ear problems were inquired from medical practioners and paramedical staff via questionnaire disclosing different ideas on human health issues caused by excessive mobile phone use [23]. Another study conducted in Karachi on teenagers using excessive mobile phone with hand free has described hearing and musculoskeletal problems in them warning the fatal consequences in future [24].

The limitations of this study are small sample size and non-consideration of different brands of mobile phones as these differ in their specific absorption ratio (SAR). Further case control or cohort prospective studies should be conducted on larger sample size establishing a cause effect relationship between excessive mobile phone use and prevalence of hearing loss. Furthermore, population-based health education seminars should be arranged in order to aware the public regarding hazardous effects of excessive use of mobile phones.

CONCLUSION:

The incidence of hearing loss in studied population was found to be 84% in group who used mobile phone for >60 min /day and 20% in group using mobile phone for <60 min/day. The severity of the hearing loss looks directly proportional to the duration of the mobile phone use.

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Original Article

Perception And Barriers Of Research Conduction Among Faculty Members Of BUMDC

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ABSTRACT:

Objective: To identify the perception and barriers regarding research conduction among faculty members of BUMDC

Methodology: Descriptive cross sectional survey was conducted in Bahria University Medical and Dental College from June-September 2018. Participants both male and female with minimum one year of clinical/academic experience were included. Exclusion criteria were those faculty members not willing to participate and visiting faculty members.

Results: The response rate of this study was found to be 116/133 (87.21%). Faculty members of MBBS were 74(63.8%), BDS faculty 34(29.3%) and DPT faculty 8 (6.9%). Most difficult area of research was found to be statistical analysis 56 (48.3%). Research is a important component of medical education 83 (71.6%) respondents strongly agreed. I consider research as a part of long term career goals 55 (47.4%) strongly agreed. Barriers were Lack of funding was strongly agreed by 44 (37.9%). Lack of time was agreed by 49 (42.2%) respondents and strongly agrees.

Conclusion: Perception of faculty was found to be positive regarding conduction of research. Majority of faculty members reported that research is an important part of medical education to enhance knowledge. Lack of funding, time and access to journal were found to be barriers in conducting research. Interest in research will develop if these barriers are minimized.

Key Words: Research, barriers, evidence based practice, medical faculty

INTRODUCTION:

Research in health care profession has a vital role in improving academic, clinical care facilities and administration[1,2]. Developing countries are lacking in the field of research due to different barriers in conducting research studies which ultimately leads to the dependency and reliance upon western[3]. Research is the main universal tool for health care professionals to groom their academic and clinical performances. The prospective of evidence based clinical and academic practices can be supplemented productively by the combine efforts and support of faculty members for each other[4]. Research skills enhances the critical thinking process of individuals[5] previous studies have documented that due to lack of basic facilities, the interest level and practical applicability of research has declined[3,6]. There is prominent gap between research and actual practice and the reason for this gap is, the high pressure for more and more publications within a year and changes rigor-relevance framework criteria of journals which only favor rigor[7]. Knowledge of evidence based practice while using different research methodologies in medical schools is very concomitant with post graduate research work and carrier development in medical academics. For this purpose many institutes are making policies and taking strong initiatives like mandatory tasks for students[8].

Many health care seekers get unsuitable or even needless care for their major concerns without evidence based practice[9]. The idea of research based guidelines are positively reinforced by many health care professionals all over the world but practical implication is still far away in many setups[10]. Major issue faced by health care professionals while conducting a research is not enough time to produce quality research work in job timing[11]. Some barriers found for the conduction of research by the Promoting Action on Research Implementation in Health Services (PARIHS) model i.e. unable to statistically analyze the data, limited understanding of results from studies and their practical usability, unavailability of data sources to find evidence base[12]. While many other barriers are also present to be encounter by professionals for research[13]. These barriers can be categorized into personal barriers: which are related to individual's own knowledge, skills, and time management capabilities, inability to understand research methodology, results and its interpretation. Organizational barriers: which involve support, autonomy to implement change in health care on basis of evidence based practice. Cultural barriers: include un-acceptance of established health care model in practical[14].

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Received: 01-10-18
Accepted: 07-12-18

New innovations or further investigation about already existing knowledge through the process of intellectual critical thinking comes in the domain of research activities[15]. Implementation of evidence based practices in relevant field is not possible without the support of institutional head, colleagues and staff members[16]. By conducting the questionnaire based survey among faculty members in out setup can identify the problems and barriers being faced by participants in conducting research. This might be helpful for smooth conduction of research studies.

METHODOLOGY:

Ethical clearance was received from Faculty Research Committee (FRC) & Ethical Review Committee (ERC) for the study to be under taken in Bahria University Medical and Dental College (BUMDC) vide FRC letter # FRC-BUMDC 17/2018 & ERC letter # ERC 52/2018 respectively. The descriptive cross sectional survey was conducted from June-September 2018. 116 Participants both male and female with minimum one year of clinical/academic experience were included from medical (74), dental (34) and doctor of physical therapy section (8) (lecturer, Sr. Lecturer Assistant Professor, Associate Professor and Professor) with Non probability convenient sampling. Faculty members not willing to participate and Visiting faculty members were excluded from the study. The sample size was calculated through the prevalence of 50%, confidence interval 95%, 5% margin of error and expected population was 210 through the below mentioned formula.

$n=N*Z^2*P\ (1-P)/\ [d^2*(N-1)+Z^2*P(1-P)]$

$n=210*(1.96)^2*0.5(1-0.5)/[(0.05)^2*(1.96)^2*0.5(1-0.5)]$

n=136 (required sample)

A self-administered questionnaire with identity remained anonymous was distributed to faculty members of BUMDC from the post of lecturers up to professors. First part of the Questionnaire was based upon demographics and then thirteen questions were asked about perception of faculty members regarding research with likert scale responses of strongly agree to strongly disagree. These questions were taken after extensive literature search.

Second part of the questionnaire was based upon ten questions regarding barriers in conducting research and these questions were also taken from previous research work with same likert scale responses. some questions were added according to the local scenario of the institute. Questionnaires were collected back with response rate of 87.21% after a week of distribution. Those participants who did not respond within a week were given extra one week and then were reminded. As questionnaire was anonymous and full confidentiality was given to each participant without showing their name but the department has to be mentioned for comparison of results. Estimated time to complete the questionnaire was 10 -15 minutes.

Statistical analysis has been done on SPSS version 23.0. Frequency and percentages were calculated for all categorical variables. Bar/ Pie chart are made for different variables.

RESULTS:

The response rate of this study was found to be 116/136 (85.29%). Twenty questionnaires/ proforma were not filled and returned empty so these were excluded from data analysis. Faculty members of MBBS were 74(63.8%), BDS faculty 34(29.3%) and DPT faculty 8 (6.9%) respectively. Male to female ratio was 1:3 in which 29 (25.0%) male and 87 (75.0%) were female. senior lecturers participated were 45 (38.8%), professors were 20 (17.2%). Most of the faculty members 73 (62.9%) were doing academic job. There were 97 (83.6%) respondents who have conducted earlier researches. Most difficult area of research was found to be statistical analysis 56 (48.3%). Most of the faculty involved was MBBS with Senior lecturer 25 whereas Professor and Lecturers were same 19. BDS faculty contains 17 senior lecturers and 11 lecturers. DPT faculty includes 4 lecturers and 3 senior lecturers and 1 assistant Professor. (Figure 1). Mostly the difficult area in research was Statistical analysis. There were 17 lecturers, 21 senior lecturers, 2 assistant professors, 7 associate professors and 9 Professors who mentioned statistical analysis is the difficult portion in research. Only two respondents told nothing is difficult in research. (Figure 2). Perception of research was asked in 13 questions from respondents. When asking about I consider research as important component of medical education 83 (71.6%) respondents strongly agree followed by 23 (19.8%) agree with this opinion. The question I am involved in research because it is mandatory 32 (27.6%) strongly agreed followed by 37 (31.9%) agreed while only 7 (6.0%) strongly disagree. When asking about I have no interest in research 55 (47.4%) disagreed the statement, 30 (25.9%) strongly disagreed on it. The question I consider research as a part of long term career goals 55 (47.4%) strongly agreed followed by 45 (38.8%) agreed upon it. The question I think that BUMDC curriculum should have mandatory time for research 47 (40.5%) strongly agreed and 39 (39.6%) agreed upon it. When asking about I have adequate time in doing working hours to pursue research 41 (35.3%) disagree while 12 (10.3%) strongly disagree about time management. When asking about I receive adequate training in research methodology in medical college 31 (26.7%) agree and only 12 (10.3%) strongly agree on it. The question Research mentors are easily available to me was disagreed by 38 (32.8%) whereas 28 (24.1%) agreed upon it. When asking about Research supervisor's offer good training and guidance to me 34 (29.3%) agree while neutral response were given by 41 (35.3%) respondents. When asking about I have adequate opportunities to present research in medical college 43 (37.1%) agreed and 12 (10.3%) strongly agree on it. The question Appreciation and acknowledgment by higher authorities to do research is sufficient was agreed by 51

(44.0%) and strongly agree by 13 (11.2%) respondents. When asking about I am doing Research because my peers are doing it 41 (35.3%) disagree and 17 (14.7%) strongly disagree on it. (Table 1). Questions regarding barriers of research were responded by all. Lack of funding was strongly agreed by 44 (37.9%) and agreed by 41 (35.3%) respondents. When asking about Lack of knowledge it was disagree by 36 (31.0%) respondents whereas 31 (26.7%) agree that they have dearth of knowledge regarding research. Lack of supervision was agreed by 39 (33.6%) while disagreed by 23 (19.8%) respondents. Lack of time was agreed by 49 (42.2%) respondents and strongly agree by 25 (21.6%). Lack of promotion/incentives was agreed by 37 (31.9%) whereas disagree by 25 (21.6%). When asking about Lack of access to journal 34 (29.3%) agree with this opinion while 30 (25.9%) responded disagree. When asking about Lack of free access to literature 34 (29.3%) agreed and 32 (27.6%) disagreed upon it. Lack of supports from colleagues was found in 25 (21.6%) responded who agreed on it. Whereas 45 (38.8%) found to be neutral. Lack of cooperation from participants was agreed by 39 (33.6%) respondents and 27 (23.3%) disagreed on it. Lack of cooperation from institution for data collection 30 (25.9%) respondents agreed while 14 (12.1%) strongly agree on it. (Table 2)

DISCUSSION:

This study aimed to focus on perception about research and barriers regarding research conduction among faculty members of BUMDC, as research is an important component of present day health care system which cannot be ignored in either academic or clinical institutes. This topic can lead to understanding about important issues faced by researchers in form of barriers in institutes as a result; institutes can help themselves in providing better environment and facilities for future researchers.

In this study majority of the participants responded strongly agree on the fact that research is an important component of medical education, many of the participants perceive their higher interest in research and considering it the long term carrier goals for themselves which is positive aspect about awareness of the research and evidence based practice. Participant's perception about the time given for research is not adequate which should be considered by the institute.

Pager has reported in their study that research conduction in institutes is not likely to be done without faculty's interest in research and evidence based practice flourish the skills with development of self-confidence, self-satisfaction in doing their job and identifying the problems, clearing inquisitiveness of mind by answering the questions with research.[18]

Ghazzawi has stated that lack of time provision by institutes is an extrinsic factor organizational behavior for limitation of research practice because research is time taking activity, either a data collection part or searching and writing a literature.[19]

Present study highlighted a very important intrinsic and predominantly extrinsic barriers faced by faculty members of institute which include lack of time for research at the top of the all barriers followed by lack of funding and promotion or incentives for practicing the evidence based practice. Participants agreed on the point that free access to journals and literature was lacking and making hurdles for researchers with low cooperation of research participants. Sabzwari has stated same findings in their study related to barriers of time allocation for research while on the other hand the lack of funding and incentives were considered least bothered barriers in research conduction[20]. Another study also reported the barriers to be lack of time, overburdened workload, and funding support for faculty members[21].

Research training of the faculty members is responsibility of medical education department of any institute, because participants perceived in present study with little or no training during medical college degree duration. While Raza has reported that research activity should be mandatory for medical colleges' curriculum for the professional

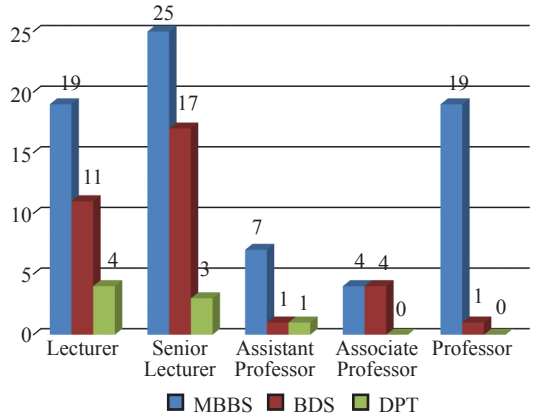

Figure 1: Disciplane wise Designations

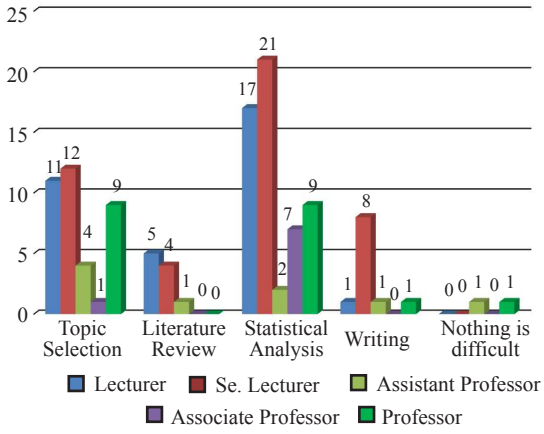

Figure 2: Difficult area in research in comparison of Designations

Items	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I consider research as important component of medical education	83 (71.6%)	23 (19.8%)	7 (6.0%)	3 (20.6%)	0
I am involved in research because it is mandatory	32 (27.6%)	37 (31.9%)	22 (19.0%)	18 (15.5%)	7 (6.0%)
I have no interest in research.	10 (8.6%)	7 (6.0%)	14 (12.1%)	55 (47.4%)	30 (25.9%)
I consider research as a part of long term career goals	55 (47.4%)	45 (38.8%)	8 (6.9%)	5 (4.3%)	3 (2.6%)
I think that BUMDC curriculum should have mandatory time for research	47 (40.5%)	39 (33.6%)	15 (12.9%)	11 (9.5%)	4 (3.4%)
I have adequate time in doing working hours to pursue research	10 (8.6%)	29 (25.0%)	24 (20.7%)	41 (35.3%)	12 (10.3%)
I receive adequate training in research methodology in medical college	12 (10.3%)	31 (26.7%)	24 (20.7%)	32 (27.6%)	17 (14.7%)
Research mentors are easily available to me	11 (9.5%)	28 (24.1%)	28 (24.1%)	38 (32.8%)	11 (9.5%)
Research supervisors offer good training and guidance to me	11 (9.5%)	34 (29.3%)	41 (35.3%)	22 (19.0%)	8 (6.9%)
I have adequate opportunities to present research in medical college.	12 (10.3%)	43 (37.1%)	35 (30.2%)	18 (15.5%)	8 (6.9%)
I have adequate opportunities to publish research during medical college	16 (13.8%)	42 (36.2%)	27 (23.3%)	23 (19.8%)	8 (6.9%)
Appreciation and acknowledgment by higher authorities to do research is sufficient.	13 (11.2%)	51 (44.0%)	34 (29.3%)	12 (10.3%)	6 (5.2%)
I am doing Research because my peers are doing it.	8 (6.9%)	33 (28.4%)	17 (14.7%)	41 (35.3%)	17 (14.7%)

Table 1: Perception of Research

Items	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Lack of funding	44 (37.9%)	41 (35.3%)	24 (20.7%)	6 (5.2%)	1 (0.9%)
Lack of knowledge	5 (4.3%)	31 (26.7%)	24 (20.7%)	36 (31.0%)	20 (17.2%)
Lack of supervision	16 (13.8%)	39 (33.6%)	22 (19.0%)	23 (19.8%)	16 (13.8%)
Lack of time	25 (21.6%)	49 (42.2%)	25 (21.6%)	10 (8.6%)	7 (6.0%)
Lack of promotion/incentives	21 (18.1%)	37 (31.9%)	23 (19.8%)	25 (21.6%)	10 (8.6%)
Lack of access to journal	12 (10.3%)	34 (29.3%)	25 (21.6%)	30 (25.9%)	15 (12.9%)
Lack of free access to literature	19 (16.4%)	34 (29.3%)	20 (17.2%)	32 (27.6%)	11 (9.5%)
Lack of supports from colleagues	7 (6.0%)	25 (21.6%)	45 (38.8%)	30 (25.9%)	9 (7.8%)
Lack of cooperation from participants	9 (7.8%)	39 (33.6%)	32 (27.6%)	27 (23.3%)	9 (7.8%)
Lack of cooperation from institution for data collection	14 (12.1%)	30 (25.9%)	35 (30.2%)	27 (23.3%)	10 (8.6%)

Table 2: Barriers of Research

development[3]. Statistical analysis of the research is considered to be the most difficult and technical part of research conduction among the faculty members of BUMDC, other studies reported the same preferences about barriers while statistical analysis to be one of the top five barriers in research conduction[22,23].

Duncan has reported in their study that lack of financial funding and medical research methodology knowledge are leading to the least interest of faculty members in conducting research[24].

The barriers faced by the faculty members in data collection

process is also considered to be the most bothersome barrier which is due to the lack of cooperation by sample individuals either rejecting to participate in research or wrong answers to the questions asked by researcher[25].

CONCLUSION:

Perception of faculty regarding conduction of research was found to be positive. Mostly faculty members reported that it is an important part of medical education to enhance knowledge. They consider research as a part of long term career goals. However, Lack of funding, time and access to journal were found to be the main barriers in conducting research. Interest in research will develop if barriers are removed from the pathway or even if they are minimized.

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Original Article

Grading Of Prostate Volume And International Prostatic Symptom Score (IPSS) In A Subset Of Karachi Population

Iffat Raza, Mahrukh Kamran, Sadaf Shaheen

ABSTRACT:

Objective: Analyze grading of IPSS (International Prostatic Symptom Score) and PV (Prostate Volume) of BPH patients in a subset of Karachi Population.

Methodology: A 103 Benign prostatic hyperplasia(BPH) patients were recruited. A cross-sectional study was done Prostate Volume was recorded along with their IPSS also noted.

Result: Among BPH patients 25.2% patients had prostate volume of 25 to 30 ml , 52.5% of patient had prostate volume of 30 to 50ml and 22.3% of patients had prostate volume above 50 ml. In IPSS grading 82.5% patients were under moderate symptom group and 17.5% were under severe symptom group.

Conclusion: International Prostatic Symptom Score continues to increase as Prostate volume increases.

Key Words: International Prostatic Symptom Score (IPSS), Prostate volume (PV), Lower Urinary Tract Symptoms (LUTS)

INTRODUCTION:

Benign Prostatic Hyperplasia is a noncancerous enlargement of prostate gland. The disease can be assessed on two parameters. Objective and Subjective. "Objective parameters are prostate volume, urinary flow rate, determination of post void residue. Subjective parameters are incomplete emptying, frequency, intermittency, urgency, weak stream, straining and nocturia"

There are number of questionnaires available which assesses the symptoms of Benign Prostatic Hyperplasia. Some of these questionnaires are Boyarksky score, Madsen Iverson score, and Danish prostatic symptom score, International Prostatic Symptom Score(IPSS), Maine medical assessment score)[1].

Subjective parameters are used to quantify Lower Urinary Tract Symptoms (LUTS) as is assessed by International Prostate Symptom Score. As IPSS consists of seven questions. Each question consist of maximum 5 and minimum 0 score with a total score of IPSS constituting 35. World Health Organization has modified IPSS and severity of lower urinary tract symptoms is always graded as a mild symptom, moderate and severe symptom. On assessing the symptoms of LUTS patients were scored. A score of 0-7 comes under category of mild LUTS, 8-19 score has moderate LUTS and 20-35 score has severe symptoms as checked by IPSS score .

IPSS study was conducted by J.A. Chicharro et al in 1998, on 1106 men to correlate symptoms with BPH[2]. Results indicate that prostate volume increases with age as IPSS also increases and moderate lower urinary tract symptoms is perceived as poor quality of life[3]. Recently in a study conducted in Shanghai[4] demonstrated usefulness of IPSS in the evaluation of BPH.

In clinical practice and research, the symptom severity of patient, as it is being assessed by prostate volume and negative impact of LUTS on patient life as assessed by IPSS should be accurately recorded. The dire need to assess and grade IPSS and Prostate volume in our subset of population is essential as all the therapeutic regimen like medications, surgeries and behavioural therapies will depend on reducing the severity of symptoms in patients and also alleviate the negative impact of LUTS on their life.

METHODOLOGY:

A cross sectional study was carried out in Ziauddin University Hospital, Karachi 2016. Samples were selected through convenience sampling. Target population was BPH patients aged 40 years and above with IPSS > 8. An informed consent was obtained from each participant. After taking history an IPSS questionnaire was filled and IPSS was then calculated.

Patients with urinary retention status, prostatitis, Known case of prostatic carcinoma and on medications using 5-alpha reductase inhibitors and anti-androgens were not included in this study. These subjects were excluded from the study by observing their past medical history or by patient clinical reports and as well as by abdominal ultrasound conducted for prostatic volume also helped to exclude kidney diseases along with above mentioned exclusion criteria.

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Received: 04-09-18
Accepted: 16-10-18

Sample size included 103 BPH patients. Out of them 37 were already diagnosed as BPH prior to ultrasonography from urology clinic, 50 volunteers with IPSS >8 and PV >25ml fulfilling our study criteria were also included in this study as BPH patients.

Radiological assessment was carried out using Ultrasound machine, Toshiba Xario version 0.09, 3.5 Megahertz curvilinear transducer was used.

SPSS version 20 was used for analyzing statistics. Variables that were quantitative in nature was measured using ANOVA and Pearson correlation and Multinominal Regression. <0.05 P value was taken as notable.

RESULTS:

In this study, BPH patients were categorized on the basis of their prostate volume. PV of 25-30ml were categorized as Grade 1, PV between 31-50ml were those subjects that were categorized as Grade 2, whereas Grade 3 were subjects between 51-93ml of prostate volume.

The table shows that using the total symptom score of each subject, 85 of them (82.5%) experienced moderate lower urinary tract symptoms (LUTS) and 18 of them (17.5%) experienced severe symptoms. Therefore, using IPSS, 103 BPH subjects had LUTS suggestive of BPH.

In order to check the association of IPSS (International Prostate Symptom Score) groups with PV (Prostate Volume). In this study, IPSS was divided into 2 groups according to the severity of symptoms of BPH patients i.e moderate and severe groups. Highest mean Prostate volume was found in IPSS severe score group as shown in table 3. This was statistically significant (p-value 0.030).

There was progressive increase in IPSS scoring with mean prostate volume increasing from 40 ml in moderate score group to 61ml in severe score group.

GRADING OF PV (ml)	Frequency(n)	Percent %
Grade 1 – (25-30ml)	26	25.2
Grade 2 - (31-50ml)	54	52.5
Grade 3 - (51-93ml)	23	22.3
Total	103	100

Table 1: Distribution of samples with respect to Grading of PV.

Ipss Grading	Frequency(n)	Percent%
Moderate Score (8-19)	85	82.5
Severe Score (20 Onwards)	18	17.5
Total	103	100

Table 2: Distribution of BPH patients according to IPSS grading.

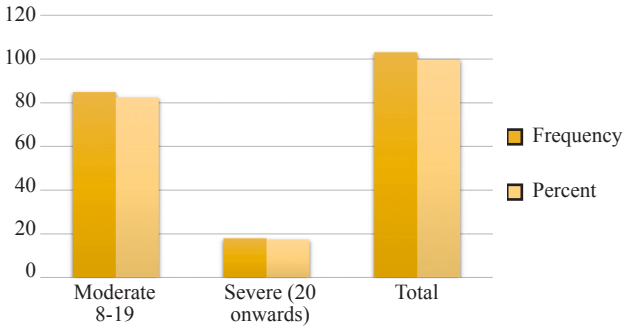

Figure 1. Severity of Symptoms

IPSS groups	Moderate score (8-19)	Severe score (20 onwards)	Total IPSS	p-value
N	85	18	103	0.035*
Prostate volume(ml)	40.3 ± 10.8	61.1 ± 19	42.5 ± 15.3	

Table 3: IPSS groups with respect to PV.

DISCUSSION:

In this sample of 103 patients, we found that 26 patients had 25 to 30ml of prostate volume (Table 1). Large number of patients were having 31 to 50ml of prostate volume in our study and only few patients reached 51 to 93ml of prostate volume with gross enlargement. A study by Collins et al found that 1627 patients showed maximum number of patients having the prostate volume ranging between 30 to 40ml[5]. Baswaraj et al found that 79% of BPH patients had prostate volume between 25 to 50ml. This study is in accordance to above mentioned study as 80% of our population had prostate volume ranging between 25 to 50 ml[6].

The need of grading of prostate volume is important as it helps urologist in decision making of the kind of treatment required by the BPH patients. Wang in his study reported, they designated their grading as a, b & c. Grade a was patients with Prostate volume < 20ml, Grade b was prostate volume between 20 to 40 ml and grade c was prostate volume greater than 40ml[7].

Prostate volume size is crucial as it helps urosurgeons to decide small prostate size but median lobe enlargement needs surgical excision whereas large prostate size with no enlargement of median lobe can be treated by 5 alpha reductase inhibitors. Usually patients with 70ml or more requires suprapubic prostatectomies[8].

In our study 85 number of patients were in the moderate symptom group. It follows therefore, that IPSS can be used to detect and determine the severity of BPH in order to select the most appropriate treatment group, while severe symptoms group were 18 patients as assessed by IPSS (Table 2). A Nigerian study in 2012 reported that 71% of their patients were in the moderate symptom group[9]. However, Overland

et al. in their study found 23.6% of their patients had moderate symptoms and only 5% of the patients had severe symptoms[10] IPSS increases with increasing Prostate Volume in our study as shown in table 3.

The variability of symptoms may be due to variable pattern of prostate enlargement. Excess growth in the transitional zone can produce enlargement without significant obstructive symptoms. On the other hand, periurethral enlargement or nodular growth can produce obstructive symptoms with no enlargement of gland as a whole[11]. IPSS increased with increasing prostate volume in our study as shown in table3.

This study also reported the association of Prostate volume with IPSS, notified that patients with IPSS of 8 to 19 which is a moderate group also has prostate volume of 40 ml whereas severe score group which is 20 to 35 also has significantly increased prostate volume of 60 ml.

IPSS proves to be valuable tool in management of Benign prostatic hyperplasia. Patients falling in IPSS moderate symptom group with prostate volume enlargement of >30 ml and aged 50 years can be given treatment of 5 alpha reductase inhibitors[12]. Combination therapy of alpha blockers and 5 alpha reductase inhibitors is given to patients with LUTS along with prostatic enlargement, this combo drug helps in preventing urinary retention status as well as can delay surgeries of those patients who are reluctant to undergo surgery[13]. Patients with larger prostate volume along with falling in severe symptom group of IPSS requires Trans urethral resection of prostate (TURP) which serves to be a gold standard treatment in BPH[14]. However, open prostatectomies are for patients with larger prostate gland ,patients not fit for TURP with risk of excessive bleeding[15]. TUIP (transuretheral incision of prostatectomy) can be done for patients with prostate volume of 30 ml or less having mild to moderate symptoms[16,17]. Minimally invasive surgeries like TUMT (trans uretheral microwave therapy) and TUNA (trans urethral needle ablation)[18] are also preferably for younger patients falling in moderate symptom IPSS group with small to moderate size prostate gland[19]. IPSS is a simple document, a simple questionnaire should be present in urological clinics, simple affective tool in management of LUTS along with BPH[20].

CONCLUSION:

Benign prostatic hyperplasia is most common disease afflicting aged men of our society. PV continues to increase so does the symptom score. IPSS can be an affective tool for health care providers in assessing degree of severity of symptoms of BPH patients, before recommending BPH patients for TAUS or TRUS

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Original Article

Assessment Of Anxiety In Patients Attending Baqai Dental Teaching Hospital Karachi-A Cross Sectional Study

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ABSTRACT:

Objective: The objective of the present study was to assess the anxiety levels in patients visiting Dental teaching Hospital by using Corah Dental anxiety scale. (DAS)

Methodology: A cross-sectional study was conducted on patients attending Out Patient Department of Oral Diagnosis Baqai Dental College between June 2017 - Jan 2018. A simple random sampling technique was used for the study purpose. The sample population included patients attending OPD of Oral Diagnosis Department for routine dental checkups, scaling, filling, root canal treatment and extraction. Descriptive statistics were obtained and the mean standard deviation was calculated. Chi-square test was done to compare association of dental anxiety among male and female patients visiting Baqai Dental College. Data was analyzed using SPSS software (Statistical Package for the Social Sciences, Version22).

Results: Based on severity of dental anxiety, 46.4% , 34.8% and 15.2% males were found to be moderately, highly and extremely anxious respectively whereas 53.6% , 65.2% and 84.8% females were found to be moderately , highly and extremely anxious.

Conclusion: The present study concluded that female patients were found to be more anxious than males. Therefore dental surgeons should take adequate measures to manage level of dental anxiety amongst patients visiting dental teaching hospitals of Karachi.

Key Words: Corah's Dental Anxiety Scale, Dental anxiety, Fear, Phobia

INTRODUCTION:

Dental anxiety is defined as an unpleasant complexed emotional state of anxiousness related to an expected encounter associated with a stimulus of fear[1]. It is often stated as a cause of irregular dental visits, delayed pursuing dental treatment or even avoidance of dental treatment[2] and therefore leading to worsen oral health. [3,4] Worldwide dental anxiety is considered to be one of the utmost commonest type amongst several other types of anxieties.[5,6]. Mehrstedt et al [7] and Crofts-Barnes et al [8] have reported that those experiencing high levels of dental anxiety are amongst those with the poorest oral health related quality of life. B Mehboob[9] showed 27 % of the patients were found to be dental phobic.

But the findings of another study revealed that dental anxiety was reported only among 3% percent of the patients[10].

Gender, age, objects and situations are possible factors of dental anxiety[6]. It has also been observed in various studies that dental instruments could be one of the main reason for causing dental anxiety when it is placed in a mouth results in gag reflex[11].

Regarding gender, females have been consistently identified as having high levels of dental anxiety when compared to male patients[12]. Hagglin C et al [13] conducted a research on middle-aged and elderly women and reported that both dental anxiety and regular dental attendance declines with increasing age. The oral health of dentally anxious women who visited the dentist regularly was better than those who visits irregularly[14]. Z Morse[15] revealed that anxiety was greatly experienced by females and in individuals undergoing dental extraction. Stabholz A et al[16] showed that females were very anxious when undergoing Root canal treatment[16]. Poor oral hygiene results in shame and avoidance for the patients to visit the dentist and seeks dental treatment only when experiences pain with unbearable symptoms[17]. Dentists must assess levels of patient's anxiety in order to provide quality treatment. Lower levels of anxiety is managed by creating a friendly environment and reassuring the patient. Similarly moderate levels of anxiety was managed by coping strategy whereas pharmacological management is necessary for extremely phobic/ anxious patients[18]. The rationale of the present study was to assess dental anxiety in adult patients and their association with age, gender, past dental history and frequency of dental visits. Dental anxiety has a widespread effect on an individual's personality and therefore it is of utmost importance for dental surgeons to identify anxious patients and manage them accordingly.

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Received: 05-10-18
Accepted: 13-11-18

METHODOLOGY:

A cross-sectional study was conducted on patients attending Out Patient Department of Oral Diagnosis Baqai Dental College between June 2017 to Jan 2018. The Ethical Committee of Baqai Medical University approved the study design and all the respondents were provided to sign a detailed consent form.

A simple random sampling technique was used for the study purpose. The sample population included patients who attended Out Patient Department of Oral Diagnosis Department for routine dental checkups, scaling, filling, root canal treatment and extraction. Patients who had impacted teeth, severe periodontal disease and with the history of anxiety disorders were excluded from the study. The sample size was calculated by taking 50% prevalence rate and computed using Open Epi version 3.03a at 95% confidence interval and á =5%. The sample size calculated was 384. The questionnaire consisted of two sections. The first section included the demographic profile and the second section included the Dental Anxiety Scale (DAS). The questionnaire included four questions that were used to measure the anxiety level due to certain dental procedures and situations. These include the following:

a) If you had to go to the dentist tomorrow for a check-up, how would you feel about it?

b) When you are waiting in the dentist's office for your turn in the chair, how do you feel?

c) When you are in the dentist's chair waiting while the dentist gets the drill ready to begin working on your teeth, how do you feel?

d) Imagine you are in the dentist's chair to have your teeth cleaned. While you are waiting and the dentist or hygienist is getting out the instruments which will be used to scrape your teeth around the gums, how do you feel?

Each question has five points Likert responses. These responses range from relaxed coded as 1to so anxious coded as 5[19]. Assessment of the level of anxiety is calculated by summation of points of scale items as following: lowest score 8 means no anxiety, 9 - 12 means moderate anxiety, 13 – 14 means high anxiety, and 15 – 20 means severe anxiety/ phobic[20].

Descriptive statistics were obtained and the mean standard deviation was calculated. Chi-square test was done to compare association of dental anxiety among male and female patients visiting Baqai dental college. Data was analyzed using IBM SPSS software (Statistical Package for the Social Sciences, Version22).

RESULTS:

The sample consisted of 144 males and 240 females aged 18-35 years. Based on severity of dental anxiety, 46.4% , 34.8% and 15.2% males were found to be moderately, highly and extremely anxious respectively whereas 53.6% , 65.2% and 84.8% females were found to be moderately , highly and extremely anxious. A statistically significant association was found between gender and levels of anxiety (p-value 0.000). Mean DAS was found to be 2.73. (Table 1). Seventy (83.3%) of the female respondents and 14(16.7%) of males were very anxious when asked about the visit scheduled for next day. Forty six (90.2%) of females and 5(9.8%) of males were very anxious about waiting for the turn on dental chair. Twenty nine (82.9%) of the females and 6(17.1%) of males were found to be very anxious about waiting for turn to get the teeth drilled. Twenty seven (93.1%) of the females and 2 (6.9%) of males were very anxious about their teeth to be cleaned. (Table 2).

DISCUSSION:

Fear is considered to be an inevitable thrilling, a response to some external stimuli in which individual is afraid without clear reasons[21]. The result of the present study was done to assess the level of dental anxiety in patients visiting dental teaching hospital. Karachi. Levels of dental anxiety was calculated by using Corah's Dental Anxiety Scale. The present study reported mean DAS to be 2.73 in a sample of patients attending dental teaching hospital. Anzar W[22] in a study reported mean DAS to be 9.3 in local sample population of Karachi. Olszewska et al[23] calculated mean Dental Anxiety Score (DAS) to be around 10.5 in their study on Krakow's residents. Iqbal M in a study reported that mean score for DAS was 8.74[24].

In this present study females were found to be more anxious than males. Results from this study reported that 106(84.8%) of females were found to be severe anxious and 19(15.2%) males severely anxious. 16(27.6%) of the females and 42(72.4%) of males were found to be not anxious. Wahid U et al[25] in a study reported that 24(9.3%) of the female respondents were found to be severely anxious, 9(7.4%) highly anxious, 127(49.2%) moderately anxious and 88(34.1%) non anxious. Six (4.8%) of the male respondents were found to be severely anxious, 61(48.8%) moderately anxious and 58(46.4%) non anxious.

Jafarzadeh et al [26] in a study showed that females were found to be more anxious than males. Anzar W [22] in a study reported that females were more anxious as compared to men. Similar findings were reported by Stabholz A et al[27], Malvania[28], Cristospher et al.[29] Sardar KP et al[30] in a study also reported that females were found to be more anxious than males. The reason behind is the difference in brain chemistry of male and female as the fright and flight response in females are more readily active partly due to action of estrogen and progesterone[31].

Corah's Dental Anxiety Scale consists of 4 items with 5 point Likert responses[19]. The first item was related to patients' anxiety level that was scheduled for the next day. Iqbal M[24] in a study reported that 100(43.5%) of the respondents were

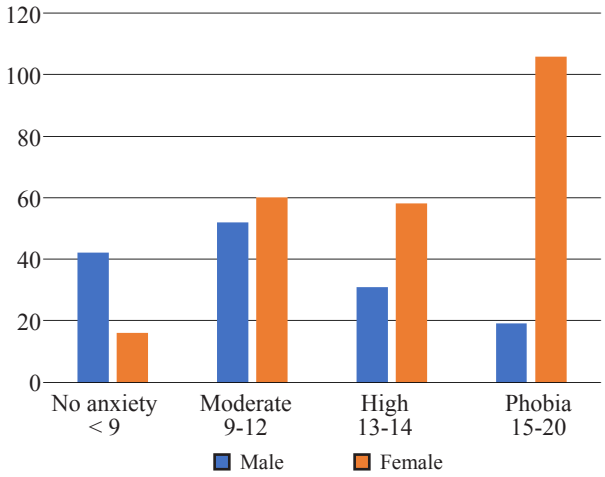

Figure 1: levels of Dental anxiety scale amongst patients

DAS Items	n	Mean ± SD	Mean DAS
Anticipation for checkup for the next day	384	3.63 ±1.112	2.73
Waiting in the dentist office	384	3.06 ±1.238	
Waiting for the dentist to start drilling of tooth	384	2.99 ±1.146	
Waiting for the dentist to clean the teeth	384	3.04 ±1.116	

Table 1: Descriptive study (Mean and standard deviation of DAS)

	Gender	Item 1	Item 2	Item 3	Item 4
Relaxed	Male	20(80%)	35(68.6%)	29(69%)	29(76.3%)
	Female	5(20%)	16(31.4%)	13(31%)	9(23.7%)
A little uneasy	Male	18(54.5%)	42(53.2%)	47(51.1%)	45(51.1%)
	Female	15(45.5%)	37(46.8%)	45(48.9%)	43(48.9%)
Tense	Male	41(47.7%)	36(35.3%)	45(40.2%)	40(37.4%)
	Female	45(52.3%)	66(64.7%)	67(59.8%)	67(62.6%)
Anxious	Male	51(32.7%)	26(25.7%)	17(16.5%)	28(23%)
	Female	105(67.3%)	75(74.3%)	86(83.5%)	94(77%)
So anxious that I sometimes break out in a sweat or almost feel physically sick	Male	14(16.7%)	5(9.8%)	6(17.1%)	2(6.9%)
	Female	70(83.3%)	46(90.2%)	29(82.9%)	27(93.1%)

Table 2: Percentage of patients DAS score

found to be relaxed, 96(41.7%) little uneasy, 18(7.8%) were tensed, 14(6.1%) were anxious and 2(0.9%) were very anxious. Wahid U et al [25] reported that 43%of the respondents were relaxed. The present study reported that 25(6.5%) of the respondents were found to be relaxed and 156(40.6%) were found to be anxious that their checkup would be unpleasant and painful.

The second question was related to how you would feel while waiting for the turn in dental office. Iqbal M [24] reported that 74(32.2%) were found to be relaxed, 104(45.2%) little uneasy, 31(13.5%) tensed, 19(8.3%) anxious and 2(0.9%) very anxious. Wahid U et al [25] reported that 44% of the respondents felt a little uneasy while waiting for their turn in dental office. The present study reported that 79(20.6%) felt a little uneasy, 102(26.6%) tensed, 101(26.3%) anxious and 51(13.3%) very anxious. The anxiety and fear can be managed by placing Brochures, leaflets or handouts illustrating different dental procedures in the office. The ambiance of the waiting area should be made relaxing by playing ambient music while the patient waits their turn[25].

Some people enclose painful encounters with the dental drill; thinking of the sound of the hand piece alone will make them anxious. The third question was related to patients' anxiety level regarding the drill ready for the treatment to be initiated. Iqbal M[24] reported that 78(34.2%) felt a little uneasy, 76(33.3%) tense, 24(10.5%) anxious and 12(5.3%) very anxious. Wahid U et al[25] reported that 28% felt little uneasy, 25% tensed. The present study reported that 92(24%) felt uneasy, 112(29.2%) tensed, 103(26.8%) anxious and 35(9.1%) very anxious. Electric driven handpieces should be used as they produces less sound. Adequate maintenance of dental handpieces are mandatory for their proper working[25].

The fourth question was related to the cleaning of the teeth. Wahid U et al [25] reported that 32% felt a little uneasy. Iqbal M [24] reported that 80(35.1%) felt a little uneasy, 49(21.5%) tensed, 29(12.7%) anxious and 7(3.1%) very anxious. The present study reported that 88(22.9%) felt a little uneasy,

107(27.9%) tensed, 122)31.8%) anxious and 29(7.6%) very anxious. This could be managed by explaining the procedure and showing videos of the procedure in the waiting area. Effective counselling also helps a patients to calm down their fears[25].

LIMITATIONS: Limitations of this study were small sample size.

CONCLUSION:

The present study concluded that female patients were found to be more anxious than males. Therefore dental surgeons should take adequate measures to manage level of dental anxiety amongst patients visiting dental teaching hospitals of Karachi.

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Original Article

Factors Associated With Patient Satisfaction – Evidence From A Primary Care Not For Profit Organization In Karachi, Pakistan

Sadia Siddiqi, Faridah Amin, Farheen Saboor

ABSTRACT:

Objective: This study was aimed to determine patient satisfaction and factors associated with patient satisfaction in a not for profit private primary healthcare service in Karachi, Pakistan.

Methodology: A cross sectional survey was conducted across eight primary healthcare clinics of Sina Health, Education and Welfare trust. A total of 557 patients visiting these primary healthcare services participated in the study. The questionnaire gauged information in 2 parts: assessing demographics and patient satisfaction with services Chi square use as the test of significance. The data was analyzed on SPSS version 20.

Results: Results revealed that majority (89%) of the patients were women and more than half were between 30-60 years of age. In the multivariable model, patients were more likely to be satisfied with less waiting time at pharmacy (p 0.007), listening (p 0.01), assessing (p 0.001) and counseling (p 0.007) skills of the doctor.

Conclusion: The study highlights a successful possibility of provision of quality primary healthcare services in developing countries with easy access for the people most deserving it especially women, at an affordable cost. One of the unique reasons for satisfaction is the training of Sina doctors and staff on regular basis.

Key Words:: Affordable cost, Counselling, Marginalized, Patient satisfaction, Primary healthcare

INTRODUCTION:

Access to basic healthcare has long been declared as a fundamental human right[1]. This involves low cost community-based preventive and curative services, with substantial community involvement. For countries with resource constraints, this has been shown to be the way forward. However, in most developing countries expensive specialist-based health services are frequently used, hence abusing this fundamental right[2]. Most affected are the poor and vulnerable segments of population, for whom, most of the health expenditure is borne out of their pockets[3] both in terms of access and cost of care.

Pakistan also has a parallel health system comprising both public and private health facilities. The public health care comprises of primary, secondary and tertiary level of care, free of cost. However the population growth has been unmatched, creating a demand supply gap. This is reflected by the presence of the current ratio of one doctor for 1099 persons, 13,441 persons per dentist and availability of one hospital bed for 1647 persons[4]. This unmet need is met by the private health facilities, using a fee for service system. In fact, this largely unregulated private sector, serves around 70 % of the country's population[5].

Understanding this need, Sina Health, Education and Welfare trust undertook this task of setting up primary healthcare (PHC) clinics in the heart of deserving communities. It is largely based on the principal of accessibility, affordability and quality. Over 80 % of Sina's patients are women and children, with over 70 % being Zakat (welfare fund) eligible, who benefit from quality healthcare provided at their doorstep. Over 300,000 patients visit these clinics annually which is projected to go up to half a million, in the next couple of years. Once the load increases, the element of quality tends to be compromised[6]. Yet, Sina's greatest asset is a quality management system. This system is unique, as it has adapted quality healthcare protocols used in developed healthcare systems for application in low-income settings. Patients are examined by qualified and well-trained physicians whose performance is rigorously monitored, with areas of improvement addressed through a robust Continuing Medical Education (CME) program.

For quality control, patient satisfaction survey is not only an important means to ensure better care for the patients, but also helps identify ways to improve practice. Also, these surveys reduce patient defection from our practice and mitigate negative word of mouth[7].

Mismatch between patient expectation and the service received is associated with dissatisfaction[8]. Patient satisfaction leads to better compliance to treatment plans and generates better outcomes [9]. Moreover, patients are able to form bonds with health care providers that encourage continuity of care.

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Received: 24-09-18
Accepted: 27-11-18

Several hospital based researches are available to assess patient satisfaction with hospital functioning but none of them are conducted in the community to our knowledge, especially when a non-governmental organization or the private sector is providing service. Hence, in order to check the quality of the low cost services provided, Sina undertook the task of conducting patient satisfaction survey across its clinics. The results of this study will help focus on areas where patient satisfaction is lacking so improvements can be made. Besides, it will also help the non-governmental organizations providing affordable health care across developing countries to gain an insight to determinants of patient satisfaction hence translating to ensure quality services at an affordable cost.

METHODOLOGY:

This is a cross-sectional study in which a total of 557 data were collected across eight PHC clinics of Sina in Karachi, Pakistan in 2015. All patients who visited the PHC over a period of one month were invited to participate.

The questionnaire gauged information in two parts: assessing demographics and patient satisfaction with services (pre-consultation, doctor's consultation and post-consultation). The outcome variable (overall satisfaction of the patient with the facility, doctor and service) was assessed through a likert scale with four categories, very satisfied, satisfied, dissatisfied and very dissatisfied.

Frequencies and proportions for categorical and continuous variables (e.g number of visits, waiting time, length of consultation) were computed. Chi-square was used to determine association of each independent factor with the outcome (patient satisfaction). Patient satisfaction was measured on a likert scale having four categories as specified, but for logistic regression, the categories were merged in two, so that satisfied and very satisfied were classified as "satisfied", and dissatisfied and very dissatisfied were classified as "not satisfied". Multivariable logistic regression was used to measure the association of multiple independent variables with binary outcome, with a confidence interval of 95%. Final effect model was be made by multivariable analysis by ENTER method. All the independent variables which were had a significant association with the outcome ($p < 0.05$) were added one by one. Variables which were insignificant were subsequently eliminated from the final model. Model fit was assessed using Receiver Operating Characteristic curve (ROC curve).

RESULTS:

Among patients attending PHC, 89 % were females and around 48 % of them were accompanied by an attendant (a family member or a friend). Around 40 % were less than 30 years of age while only 2 % were more than 60 years, rest were between 31-60 years. 82 % were married while rest were single (15 %), widowed or divorced (3%). 84 % of the patients had visited Sina at least thrice for consultation and 81 % were on Zakat (welfare) accounts. Out of 54 % who were taken to medical treatment room, 24 % were taken for a blood test, while 4.2 % had an ultrasound done. 1.4 % were taken for hydration and 1.2 % for nebulization. Among those taken to treatment room, 71 % rated the skill of person testing as "good". 75 % said that they were explained the reason for medical test/procedure and in 95 % of the cases, the doctor explained it. Among patients getting medications, 93 % said that the dosage of medicine was explained to them. In 73 % of the cases the pharmacist explained it while in 24 % cases doctor explained. 81.4% said that they walked to the clinic while 16.6 % used public transport. The average walking distance from patient's home to Sina clinic was 22 minutes (mins). Patients' average pre-consultation waiting time was 99 mins and post-doctor's consultation visit was 52 mins.

Table 1 shows the factors associated with patient satisfaction. Overall, 95 % of the patients said that they were satisfied with the services. Majority (85 %) of the patients were follow up patients and 80 % said that Sina was maintaining their personal files which was mostly easy to find. Among patients, 77 % said that they were attending the closest clinic from their residence and these patients were also more likely to be satisfied (p 0.04). Patients were also more likely to be satisfied if there was no waiting at the clinic gate (p 0.01). More than half of the patients mentioned more than 15 minutes waiting at the reception while 3/4th had to wait for more than 15 minutes for the doctor. The waiting at pharmacy was relatively less. Yet, half of the patients said that they were generally satisfied with the waiting time while patients who had to wait less at the pharmacy were more likely to be satisfied (p 0.002). Almost all of them rated the hygiene in the clinic to be good or satisfactory. Majority of the patients were called on their turns and almost all of them found the behavior of the staff good or satisfactory. Majority of the patients also graded the doctors' listening, assessing and counseling skills as "good". Patients who rated the staff's and doctor's attitude as good, were more likely to be generally satisfied with the facility ($p<0.001$).

Majority of them said that the length of consultation ranged from more than 5 to more than 15 minutes and 3/4th said that they were advised about prevention also. Most of them also said that they were explained about medical tests advised (75 %) and dosage of medications (93 %).

In the multivariable regression model (Table 2), waiting time at pharmacy (p 0.007) and listening (p 0.01), assessing (p 0.001) and counseling (p 0.007) skills of doctor were significantly associated with satisfaction from services.

DISCUSSION:

Recently, there has been a paradigm shift in health care from doctor centered to patient centered approach to improve quality of care. Along with this, other approaches like evidence based medicine, total quality medicine, assessment,

accreditation and professional development have gained popularity as means to improve quality[10]. Some of these approaches focus on professional quality, while others serve as external controls on quality. Application of these quality measures has improved the standard of health care service in Sina over the last few years. Therefore, majority of the patients in this survey were satisfied with the care they had received.

The results clearly indicate that the physician's communication skills have the greatest impact on patient satisfaction. The value of empathetic listening to patients has been highlighted in previous studies also[11]. Satisfaction with medical personnel is not only shown to be associated with satisfaction with health care service, but, it is also directly associated with patient compliance[12,13]. Training of communication skills to general practitioners has also been shown to improve patient satisfaction in a randomized controlled trial[14].

In Sina, there is continuous professional development of doctors through monthly CME sessions, medical audits, assessment through annual OSCEs (objective structured clinical exam) and appraisals. For CMEs, specialists in

Variable	Categories	Dissatisfied		Satisfied		Total		p value
		N	%	N	%	N	%	
Is this clinic closest to your home	Yes	15	3	366	73.6	381	76.7	0.04*
	No	10	2	106	21.3	116	23.3	
Waiting at main gate	No waiting	0	0	46	9.5	46	9.5	0.01*
	5-15 minutes	9	1.9	233	48	242	49.9	
	>15 minutes	16	3.3	181	37.3	197	40.6	
Waiting at Pharmacy for medicine	No waiting	0	0	8	1.6	8	1.6	0.002*
	5-15 minutes	8	1.6	279	56.9	287	58.6	
	>15 minutes	15	3.1	180	36.7	195	39.8	
Comfort in waiting area	Good	9	1.8	233	46.8	242	48.6	<0.001*
	Satisfactory	7	1.4	193	38.8	200	40.2	
	Poor	9	1.8	47	9.4	56	11.2	
Rate hygiene in Clinic	Poor	0	0	5	1	5	1	0.09
	Satisfactory	14	2.8	165	33.3	179	36.2	
	Good	11	2.2	300	60.6	311	62.8	
Attitude of staff	Good	17	3.4	329	66.1	346	69.5	<0.001*
	Satisfactory	4	0.8	134	26.9	138	27.7	
	Poor	4	0.8	10	2	14	2.8	
Dosage of medicine explained	Yes	17	3.7	409	89.3	426	93	0.01*
	No	5	1.1	27	5.9	32	7	

Table 1: patient satisfaction and their associated factors at Sina Health, Education and welfare trust (n=557)

Variable	**p value**	**Odds ratio**	**95% confidence interval**	
			Lower	**Upper**
Waiting time at pharmacy	0.007	4.73	1.52	14.72
Assessing skills of doctor	0.001			
Good	0.006	0.051	0.006	0.434
Satisfactory	0.072	0.072	0.017	0.301
Counseling skills of doctor	0.007			
Good	0.003	0.061	0.01	0.37
Satisfactory	0.686	0.696	0.12	4.02
Listening skills of doctor	0.01	6.44	1.52	12.18

Table 2: Multivariable Logistic regression model of factors associated with patient satisfaction (n=557)

different fields are invited to give pro bono lectures on family medicine topics relevant to Sina doctors' clinical practice. Doctors are assessed on best choice questions (BCQs) distributed after the sessions. Similarly, a two step medical audit is held for each doctor through audit of clinical notes, followed by onsite (consultation skills) audit. Performances are graded as excellent, satisfactory, unsatisfactory and poor. The frequency of the audit is based on grades awarded. For example, excellent audits are re-audited every 4 months whereas poor audits are reviewed every 2 weeks. The results of the CME post tests, medical audits and OSCE performances are tabulated and given due weightage in employee appraisal at the end of the year.

The pre-consultation time in this survey was 99 minutes. However the time the patient spent with the physician and his satisfaction with the doctor's consultation was found to be a stronger predictor of patient satisfaction than the amount of time spent waiting for the doctor. A previous study concluded that shortening patient waiting time at the expense of consultation time to improve patient satisfaction scores would not yield a positive outcome[15]. Yet, another study reported an inverse association between patient satisfaction and waiting time in ambulatory care settings[16]. Therefore, the excess waiting time should either be reduced or utilized by keeping patients engaged in health promotion, visual displays, hiring more volunteers for better crowd control and devising a mechanism that patients are not called for follow up visits unnecessarily.

Majority of the patients walked to the clinic and therefore the results show a relatively longer time to reach the clinic (22 minutes) which could be further reduced if patients took some type of transport to the service but that may not be cost effective.

Patients who perceived the attitude of the staff as "good" were more likely to be satisfied with services, as shown in a previous study which revealed that attitude of the paramedical staff and interpersonal aspects of healthcare are one of the key issues for patients determining quality of service[17].

The socio-demographic profile has been shown to have an influence over the satisfaction levels of patients in previous studies[18]. Although we found that gender had no influence on patient satisfaction, but the percentage of males utilizing our services was 11% only. In developing countries, particularly for poor women, gender inequities in health services are common because health services are not available or acceptable to women[19]. Hence, a higher percentage of under privileged women visiting Sina PHC services is indeed very encouraging. As in previous studies, the clinic being close to home was shown to be associated with patient satisfaction[20], which is the probable reason for a greater utilization of these service by women.

Previous surveys have found that elderly patients are less likely to be satisfied with health care services, but in this survey only 2% of the patients were more than 60 years of age, and no association of age was observed with satisfaction[21].

Besides the factors mentioned, other important determinants of satisfaction are cost of services and medicines. More than 70% of the patients paid less than Rs 5 (5 cents) for services. This is because 81% patients at Sina are on Zakat (welfare) accounts. It can be also be deduced reasonably that the expectations of this group will be less than the community with higher education and socioeconomic status, hence the higher patient satisfaction rate[22].

Although, this study is a part of regular audit of services by Sina, yet there are certain limitations of this study. The staff and doctors were aware of the survey, therefore there is a probability of hawthorne effect which may have resulted in modified behavior and hence a greater patient satisfaction. Moreover, a validated questionnaire for this survey would have improved the generalizability of results, which is another limitation of this study.

CONCLUSION:

Through this survey, a detailed insight was gained into the level of patient satisfaction with low cost primary healthcare services at Sina and factors associated with it. The results would encourage non-governmental organizations offering low cost PHC services to conduct patient satisfaction surveys and also to upgrade the quality of their services through lessons learnt from our organization, which is one of the largest, welfare NGO (Non-government organization) offering PHC services in Pakistan.

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Original Article

Outcome Of Immediate PPIUCD At Follow Up Visit In Women At A Tertiary Care Hospital In Karachi, Pakistan

Sadia Suboohi, Sughra Abbasi, Saba Pario

ABSTRACT:

Objective: To evaluate the outcome of Immediate Post Partum Intrauterine Contraceptive device (PPIUCD) insertion among married women of reproductive age at a tertiary care Creek General Hospital, Karachi, Pakistan.

Study Design: Prospective Interventional study.

Methodology: The clinical study was conducted in department of Obstetrics & Gynaecology, Creek General hospital Karachi from August 2015 to July 2016. One hundred and twenty five women were selected for immediate PPIUCD insertion, however the result was analysed for hundred women as twenty five were lost to follow-up. PPIUCD was inserted within 10 minutes of delivery of placenta. Follow up was done at 6 weeks, the primary outcome measures were the clinical outcomes in terms of safety (irregular vaginal bleeding, abnormal vaginal discharge, infection and perforation) and efficacy (un-descended IUCD strings, expulsion, discontinuation and pregnancy). The results were analyzed by SPSS data analysis software (IOBM).

Results: Among hundred women in whom PPIUCD was inserted and returned for follow-up, majority (44%) were in age group 26-30 years; around 52% had primary or less education, and considerably high (84%) belonged to the low socio economic status. Moreover, majority (46 %) had 3 or more alive children. Importantly, 73% women had IUCD inserted after vaginal delivery. As safety was evaluated, irregular vaginal bleeding was observed in 15%, abnormal vaginal discharge (20%), infection (11%), abdominal pain (4%) and perforation in only 1% of cases. Finally, in terms of efficacy the un-descended IUCD strings were observed in 7%, expulsion incidence (6%), discontinuation requested by (5%) and none of the case ended up in pregnancy.

Conclusion: Post partum IUCD insertion immediately following delivery is an effective, safe, and acceptable long-term reversible method available for postpartum contraception.

Key Words: Complications, contraception, efficacy, Postpartum IUCD, safety

INTRODUCTION:

Pakistan is sixth most populous country in the world according to Pakistan economic survey 2014- 2015[1], and the population of the country is growing with an excessive high rate being not matched for the prevalence rate of the contraception use[2]. Thus, this calls for appropriate measures for promotion and awareness among couples related to the use of contraceptives. Reduction in population growth needs to be one of our top priorities to attain a balance between country's resources and population leading to sustainable feto-maternal health improvement and socioeconomic development. It has been indicated with evidence established that birth spacing can help avoiding almost one third of maternal deaths, if pregnancies were spaced by couple for two or more years[3]. Having short intervals between pregnancies and births have been associated with an increase risk of morbidity as well as mortality, among both mother and child[4]. Irrespective of the fact that numerous contraceptives devices and measures available, certain proportion of women conceive and had unplanned or unwanted pregnancies. Moreover, certain couples have misconception and ignorance about contraception although they desire to use contraceptive measures. Postpartum period is a significant and time of extreme importance when the couples and more importantly mother are highly motivated and have increased level of acceptance to use contraceptive methods. If a contraceptive is provided prior to hospital discharge, then issues related to compliance of woman is minimized and the couple is successfully protected prior resuming the sexual activity[5]. Preventing unwanted or unintended pregnancies are significant in terms of reducing the financial, psychological, and the healthcare costs. The World Health Organisation (WHO) has recommended 24 months waiting time after birth and planning or attempting next pregnancy will decrease the risk of both maternal as well as infant poor health outcomes[6]. Intrauterine Contraceptive device (IUCD) has been associated with improved efficacy, safety with limited complications reported; thus a reliable and safe method for contraception among

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Received: 12-10-18
Accepted: 11-12-18

women[7-8]. It is one of the most prevalent, long lasting, and a reversible method of contraception for women of reproductive age globally[9]. Considering, IUCD being a reversible method, it can be removed safely at women desires with return of fertility immediately[10].

Postpartum IUCD (PPIUCD) insertion can be done post placental that is within 10 min of placental expulsion, intra-cesarean at the time of cesarean section or within 48 hours of delivery. After the placental delivery insertion of IUCD is relatively safe, thereby allowing increase IUCD insertion post placental for contraception to meet the need of community and contraception provided prior sexual activity is being resumed[11]. While, if a women wait for 6 weeks for initiating an effective contraceptive method, they are possibilities of accidentally or unintentionally and might not come for contraception[12]. PPIUCD insertion is not only advantageous for women and couples, but the healthcare service providers also benefited as ruling out pregnancies definitely, and precious time being saved as the insertion is being performed on the same delivery table with no additional evaluation or distinct clinical procedure required. Simply a special instrument may be required for PPIUCD insertion[5]. Globally it has been estimated that around 85 million women are using IUCD. Moreover, in Pakistan, especially in rural areas where health resources are scarce, it is acceptable to most couples considering its safety, being long acting though reversible, convenience and cost effectiveness[13]. According to reproductive health and family planning survey, 40% of Pakistani women use contraceptives and IUCD is used by 3.5% of women after pills and Injectables. Intrauterine devices have been used for more than three decades as an effective method of reversible contraception[14]. The present research was conducted to evaluate the outcomes of Immediate Post Partum Intrauterine Contraceptive device (PPIUCD) insertion i.e. safety and efficacy among women having delivery vaginally or by cesarean section at a tertiary care Creek General Hospital, Karachi, Pakistan.

METHODOLOGY:

This prospective interventional study was conducted in the department of Obstetrics & Gynaecology, Creek General hospital Karachi an affiliated teaching hospital of United Medical and Dental College (UMDC), for a period of one year from August 2015 to July 2016. One hundred and twenty five women were recruited in this clinical study for immediate Post placental IUCD (Multiload 375) insertion after satisfying the eligibility criteria. The inclusion criteria for PPIUCD insertions were women with age 18 to 45 years delivering at the study site either vaginally or by caesarean section, having received counseling for postpartum contraception during antenatal period or in labour room, and given written informed consent for PPIUCD insertion. Moreover, anaemic women (hemoglobin <10 g/dl), post-partum hemorrhage (PPH), pre-labour membranes rupture >18 hours or with obstructed labour, having uterine cavity distorted by fibroid or congenital malformation of uterus, pyrexia during labor and delivery, with active sexually transmitted disease or other lower genital tract infections were excluded. Vaginal PPIUCD insertions were done within 10 minutes of removal of placenta by trained doctors; the IUCD being held by the sponge holder was introduced in the uterine cavity and placed in the uterine cavity (fundus) of women. While in case of caesarean section, IUCD was placed inside the uterus (fundus) through the lower segment incision with incision being closed routinely. All aseptic measures were followed throughout the procedure. At discharge women was given card with details of PPIUCD, showing date of insertion, and was informed when to return for IUCD follow-up. Moreover, the study participants were also advised to visit any time if having foul smelling vaginal discharge, pain in the lower abdomen, fever or chills and any suspicion that the IUCD has fallen out.

Post insertion follow-up was done at 6 weeks, and women visiting were inquired for irregular vaginal bleeding, abnormal vaginal discharge, and expulsion. Abdominal and pelvic examination was performed at follow-up visit. If threads were not visible on per speculum examination, an ultrasound was performed to check for expulsion or confirm presence of intrauterine IUCD. In cases where women requested for the removal of IUCD due to any medical or personal reason, counselling was done and if non compliant or refuse, intrauterine device was removed and offered alternative contraceptive method. At recruitment patient's characteristics (i.e. age, education, occupation, socio economic status, ethnicity, number of children alive and future pregnancy desire) were recorded. Moreover, data on reasons for acceptance and insertion (vaginal or caesarean section) was also collected. The primary outcome measures were the clinical outcomes in terms of safety (menstrual irregularities, abnormal vaginal discharge, infection and perforation) and efficacy (Un-descended IUCD strings, expulsion, discontinuation and pregnancy). The clinical study was conducted according to ethical guidelines of Pakistan Medical and Research Council (PMRC) and Helenski declaration. The study is approved by the Ethical review Committee of Creek General hospital Karachi. Written informed consent was obtained from all the participants prior to enrollment. The participants had the right to withdraw at any point of the research. Importantly, it was ensured that anonymity and confidentiality of the study participant data was maintained throughout the research. The data was analysed using SPSS version 22 (IOBM). The data recorded on the pre-designed performa was entered in the SPSS software and validated twice for incorrect entries. Descriptive statistics were performed where categorical variables were presented as frequency/ percentage.

RESULTS:

A total of one hundred and twenty five women were included in this study. There were twenty five women, being lost to

follow up. Thus, the response distribution was 80% and the results were analysed for hundred women being inserted with PPIUCD. The majority of women were in age category 26-30 years (44%), followed by 31-40 years (33%), and 19-25 years (21%). Moreover, around fifty two women (52%) had no formal education or education up to primary level. Only seventeen women (17%) had education attained Matric or higher. Importantly, eighty seven percent of women were house wives. As far as ethnicity of the women enrolled in this clinical study was concerned; majority were Urdu speaking (42%), followed by Pathan (19%), Sindhi (18%) and Punjabi (16%). Moreover, majority (84%) belonged to the low socio economic status. Among hundred women inserted with PPIUCD, majority (46%) had three or more children alive, around twenty eight percent had two or more children alive, and twenty six percent had only one child alive. Finally, majority (44%) had desire of future pregnancy within 3-5 years, thirty one percent had future pregnancy desire within 1-2 years; and considerable proportion were not sure (16%) or do not want more (9%). The table 1 gives details of the demographic characteristics of the study participants. The table 2 gives details of the PPIUCD insertion and the reasons of acceptance of insertion. Among hundred women PPIUCD was inserted vaginally among seventy three percent women, while remaining twenty three percent had insertion during cesarean section. The most cited reasons for acceptance were doctors advice considering it good (27%), being safe (20%), non-remembrance once inserted (18%), being reversible (15%) and long-term (11%). The reasons non-interference with breast feeding, less number of visits required and being not hormonal were reasons less responded being all less than five percent. The table 3 gives details of safety and efficacy of PPIUCD insertion at follow-up among study participants. Irregular vaginal bleeding was observed in 15% of women, 20% of the women complained of abnormal discharge through vagina and 11% had signs of infection on examination. Perforation was only observed among one case on follow-up. Moreover, four women (4%), complaint of abdominal pain and five cases (5%) had long strings. The un-descended IUCD strings were reported identified in three cases (3%). Spontaneous expulsion of IUCD occurred in 6% cases at follow-up. IUCD removal was done on request of the women.

Characteristics	n (%)
Age categories (Years)	
19 – 25 years	21 (21)
26 – 30 years	44 (44)
31 – 40 years	33 (33)
= 40 years	2 (2)
Education	
No formal education	27 (27)
Primary	25 (25)
Secondary	31 (31)
Matric and higher	17 (17)
Occupation	
House wife	87 (87)
Employed	13 (13)
Ethnicity	
Sindhi	18 (18)
Punjabi	16 (16)
Urdu Speaking	42 (42)
Pathan	19 (19)
Balochi	5 (5)
Socioeconomic status	
Low	84 (84)
Middle	16 (16)
Number of children alive	
One children	26 (26)
Two children	28 (28)
3 or more children	46 (46)
Future Pregnancy desire	
1 – 2 years	31 (31)
3 – 5 years	44 (44)
Not Sure	16 (16)
No More	9 (9)

Table 1: Characteristics of the study participants (N = 100)

PPIUCD insertion and reasons for acceptance	n (%)
PPIUCD insertion	
Vaginally	73 (73)
Cesarean section	27 (27)
Reasons for acceptance	
Safe	20 (20)
Long term	11 (11)
Less number of visits required	2 (2)
Not hormonal	3 (3)
Non-remembrance once inserted	18 (18)
Doctor's advice must be good	27 (27)
Non-interference with breast feeding	4 (4)
Reversible	15 (15)

Table 2: Post Partum Intrauterine Contraceptive device (PPIUCD) insertion and reasons for acceptance by the study participants (N = 100)

DISCUSSION:

Post-partum period is a highly vulnerable period to unintended pregnancy and potentially an important time to start contraception as women are considerable more motivated to accept contraception, thus PPIUCD insertion following delivery of placenta as requiring no extra procedure is more convenient for women and healthcare providers with no extra cost involved.[9] Intrauterine contraceptive devices (IUCD) has several advantages of its use during post-partum period as being effective, long term, reversible, coitus dependent and non interference with breast feeding.[15]

Safety and Efficacy of PPIUCD insertion	n (%)
Complications during follow-up visit	
Irregular vaginal bleeding	15 (15)
Abnormal vaginal discharge	20 (20)
Infection	11 (11)
Perforation	1 (1)
Abdominal Pain	4 (4)
Long strings	5 (5)
Efficacy	
Un-descended IUCD string	3 (7)
Expulsion	6 (6)
Discontinuation	5 (5)
Pregnancy	0 (0)

Table 3: Safety and Efficacy of Post Partum Intrauterine Contraceptive device (PPIUCD) insertion among study participants (N = 100)

Moreover, IUCDs have rapid onset of action after administration with immediate return to fertility after discontinuation[16]. World Health Organisation has recommended the immediate post-placental insertion of IUCD as a safe and effective method for temporary contraception, thus being incorporated in different post-partum family planning programs[17]. However, studies have reported the acceptance of PPIUCD being low[18-19]. The United Nations Population Information Network (UN-POPIN) had highlighted that insertion timing of IUCD is significant as it influences the to a great extent the risk of expulsion[20]. Thus, ideally the IUCD should be inserted within 10 minutes of placental delivery or until 48 hours of delivery to have improved clinical outcomes[21]. In the current study, the IUCD was inserted immediately (within 10 minutes of delivery of placenta) among women having delivery vaginally or by caesarean section

In the clinical study conducted, irregular vaginal bleeding was observed among 15% of cases being appropriately managed by counselling and conservative treatment. Other studies have reported around similar proportion of irregular vaginal bleeding with PPIUCD insertion[22-23]. Moreover, the abnormal vaginal discharge was observed among 20% of study participants, which was later confirmed to be infectious among eleven cases after clinical assessment and microbiological confirmation. This is slightly higher (0.1%) in the study conducted among women from Paraguay[24], and considerably higher around 5% among women in India[25]. Perforation of uterus is a serious complication of IUCD insertion, and was observed in only one case in the study conducted. A study had highlighted that cases with perforation may not be identified at the time of insertion, and are recognised years after and had serious consequences as infection, pain in the abdomen, intestinal obstruction and adhension.[26] In the present study the case identified with perforation was due to secondary (perforation after 4 weeks of insertion being caused by gradual erosion through the myometrium), the study participant on follow-up visit complained of lower abdominal pain, which was diagnosed by trans-vaginal scan and x-ray and then managed appropriately by laparotomy.

The present study reported the expulsion rate as 6%, being similar to the study conducted by Reetu Hooda et al., (2016)[15]. However, higher expulsion rates were being reported in other studies[14,27]. The expulsion rate for different IUCD's are different, as Multiload have been used that had lower expulsion rate as reported in the study[28]. However, the benefits of highly effective contraceptive provision immediately after delivery surpass the disadvantage of expulsion; being considerable significant in a developing country like Pakistan with high fertility rate, low contraceptive prevalence and limited access to the healthcare facilities. particularly in country like Pakistan where women have limited access to medical care.

In the current study only 5% of study participants among those inserted with PPIUCD had lost strings during follow-up visit, which is in agreement with another study that reported less than 9% of un-descended IUCD strings were observed[23]. However, another study has reported a significantly high incidence (38%) of un-descended strings[15]. In the current study the request to remove IUCD was observed among 6% of study participants, being similar to the study by Kumar et al, conducted in 2014[25]. However, another study has reported a significantly higher proportion (15.7%) of women not willing to continue IUCD and requested to remove[29]. Importantly, in the current study no case of pregnancy was observed among women with PPIUCD insertion, similar to reported findings of other studies[15,22].

The current clinical study had certain limitations. Firstly, the study was conducted at only hospital, where majority of patients with low socio economic class and low education visits. Secondly, only hundred women with PPIUCD insertion were followed. Thus, limited sample size and selection of only study site had limited the generalisibility and external validity of the study findings. Importantly, the study participants were followed for only six weeks. Thus, in future a study with recruitment of more number of eligible participants from multiple study sites and follow-up for a longer period (i.e. 12 months or 18 months) would be of importance to better identify the clinical efficacy and safety of PPIUCD insertion.

CONCLUSION:

The present study identified that PPIUCD was an effective and acceptable contraception with fewer complications. In this clinical study conducted it was concluded that PPIUCD insertion within 10 minutes of delivery of placenta, is safe, efficacious, convenient, and a long-term reversible method of postpartum contraception. The recommendations stemming

out of the study is that PPIUCD insertion should be routinely offered to all eligible women in an antenatal and postpartum period. Moreover, increased emphasis should be given on training programs to improve provider's skills and to evaluate and manage complications.

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Original Article

Effect Of Internet Addiction On Academic Performance And Mental Health Of Medical Students

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ABSTRACT:

Objective: Objective of this study was to determine internet addiction and its impact on mental health and academic performance in medical students.

Methodology: One hundred medical students (male: 50, female: 50) aged 18–21 years were selected by convenience sampling in this cross-sectional study in Mahi-ud-din Islamic Medical college Mirpur AJK. A questionnaire of Young's internet addiction test was used to identify the prevalence of Internet addiction, the purposes of Internet use, and their priority levels. Frequencies and level of mental health was measured using Mental health Battery by Singh and Gupta. Chi square test was applied and p value <0.05 was considered significant.

Results: Out of 100 students, 46 (male: 28, female: 18) were found to be slightly addicted, 53 students were average online users and only 01 male was severely addicted. There was no significant difference between male and female students in addiction level. However, males were more addicted than females. The major use of Internet was to communicate with friends and family and to watch songs and movies. 51 students used the Internet to assess information for their educational and learning activities. Some students with overuse of the Internet lead to insufficient sleep and affected their concentration levels in the class.

Conclusion: Medical students experiencing problems due to Internet overuse and experiencing poor academic progress and lack of concentration while studying. The main use of the Internet was to communicate with friends and family and for entertainment.

Key Words: addiction, Internet, medical students, entertainment.

INTRODUCTION:

Internet, a piece of technology and revolutionary invention, can be accessed from smart phones, tablets, laptops, and desktop computers anywhere and on all sorts of different mediums. According to International Telecommunication Union about 3.2 billion people (50% of the world population) was on line in 2015, which raised to >51% by 2017; out of which 81% of the internet was used by developed countries and rest by the developing countries[1]. No doubt, if used properly, it is a very good source for information, communication, entertainment, commercials, education assistance, economics, culture and for scientific knowledge[2]. Over the last few years the use of this electronic informative source is on increase by medical student due to its cost-effectiveness and the delivery of information from any source in no time[3,4]. Sstudents and teenagers are considered to be the main population becoming Internet addict compared to other population groups[5]. The students of internet addiction show academic problems, depression, anxiety, change in lifestyle, aggression, sleeping and physical disorders, phobias and a change in attitude to their emotions[6,7]. Its continues use even results in serious consequences on lifestyle change, ignoring health and main social activities[8,9].

Mental health is "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully and is also able to make contribution to his/her community"[10,11]. The signs of poor mental health include poor concentration, easy distraction, difficulty to make decisions, loss of interest in day-to-day activities, low mood, tiredness and lack of energy, irritability and short temper and difficult to control emotions[12].

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Objective of this study was to see the frequency of internet use among medical students and its effect on academic performance and mental health.

METHODOLOGY:

This cross-sectional study was conducted on 100 undergraduate medical students (male: 50, female: 50) from first year MBBS class of Mohi-ud-Din Islamic Medical College Mirpur AJK. The students were selected by convenience sampling and any student with previous psychological illness and other systemic illness were excluded from the study. The study was approved by the ethical committee of the institution and all the participants signed the informed written consent Performa.

A standard Young's Internet Addiction Test[13] 20 items with responses on a 5 point Likert scale was distributed among the students to measures mild, moderate and severe levels of Internet addiction. The student response for each questionnaire ranged from 0 to 5: 5 = always, 4 = often, 3 = frequently, 2 = occasionally, 1= rarely, and 0 = does not apply. The IAT score was calculated by adding the scores obtained for all 20 items, (score 20–49 points: Average online user and surf the web for long at times, but have control over usage, 50–79 points: representing frequent Internet use and need consideration due to full impact on life, 80–100 points: associated with significant Internet usage and need to address the problems (students showing poor academic performance) caused by Internet usage.

A 2nd self-designed questionnaire was distributed among the students to identify the purposes of Internet use, and their priority level for different purposes. The Internet priority level was marked from "no, least, rarely, average, always". The items included to give various reasons for Internet use: Communicating with friends and families, Education and learning activities, Downloading film and music, Reading news, Learning computer applications, Watching moves and songs online, Playing online games Internet shopping, Writing weblogs, Uploading /downloading exploiting videos and images, Scientific search, Email checking, making friends and Solicitation (the act of asking for or trying to obtain something from someone). The general questions regarding mode of Internet (mobile, laptop, or desktop), any other purpose of Internet use was also asked. Additionally, monthly cost of Internet use and the impact of Internet use on their academic progress and daily activities was also assessed.

Frequencies and level of mental health of the students was measured using Mental health Battery by Singh and Gupta[14]. The Domains of Mental Health consist of Emotional Stability, Self-Concept, Autonomy, Security-Insecurity, Adjustment and Mental Capacity. Each domain consisted of at least 10 questionnaire.

After explaining the purpose of this study, questionnaires were distributed to all students during a lecture slot and were collected after the students filled them. The students were asked not to write their names in the questionnaire and chose more than one option of the questions.

The data were processed and analyzed using SPSS version 16. For descriptive statistics the frequency distribution was used.

RESULTS:

A total of 100 students were inducted in the study. The average age was 19.71±0.90. Table 1 shows internet addiction levels among the medical students. Out of 100 students, 46 students were found to be facing average problems and were found to be slightly addicted to internet use. The total percentage among male were more as compared to female students. When Internet use and its addiction level was compared between male and female students was seen between male and female medical students. In our study about 32 (32%) females as compared to 21 (21%) male students were moderate user of internet and faced frequent problems, while high addiction level with significant problem due to internet was only seen in one male student. Twenty six (26%) of the student showed that they always (scale 5) fear that life without the Internet would be boring, empty, and joyless, while 38% were often (scale 4) found addict for saying "just a few more minutes" when online. All the student agreed that internet do affect their life. On the other hand 26% agreed that their performance suffer due to internet frequently (scale 3), 28% occasionally (scale 2) use internet while going out with others and 66% rarely (scale 1) make frequent relation with online users. About 46% of the students were facing mild problems due to internet, 53% facing frequent problem and only one (01%) student was facing severe problem due to internet use and showed depression, angry, sleep deprivation, decreased ability to concentrate at work and education especially by those facing severe and frequent internet problems.

Table 2 shows purpose of internet regarding its priority. The purpose of Internet use vary among the students. The majority of students showed priority for use of some internet aspects such as communicating with friends and family members (71%), watching movies and songs on line (62%), education and learning activities (54%), and downloading films and music (53%). Other major priorities include uploading /downloading exploiting videos and images (32%), learning computer applications (30%), making new friends (30%) and scientific search (30%). None of the students declared internet to be of any significance, however, solicitation (68%), writing blogs (64%) and internet shopping (43%), playing online games (42%) were among their least prioritized. Similarly, checking emails, making new friends, uploading/downloading exploiting images and videos that harm/abuse others, reading news and scientific search were also the last priority among some students. About 15% of the students mentioned that they had lack of concentration

in their classes with poor academic progress due to overuse of the Internet. Most of the students (62%) were using internet at evening and night time. About 51 (51%) students spent about 500 Rs per month on internet, about 39 (39%) spent less than 500 Rs.

Table 3 shows distribution of mental health items according to the mental health battery by Singh and Gupta. The result showed that out of 100 students only 06 students (06%) scored more than 90 with excellent mental health, while 49 students (49%) scored between 70 to 90 and fall in good mental health category, whereas 31 students (31%) scored between 50 to 60 fall in average mental health. Only 10 student (10%) were in poor scoring between 30 to 49 and 04 students (04%) fall in very poor mental health category scoring less than 29. The female and male showed an equal percentage (03%) for excellent mental health while female have better percentage for good mental health while male were slightly higher in very poor mental health compared to females.

DISCUSSION:

Our study was conducted on 100 medical students to assess Internet use, Internet addiction levels. Our results showed that 46 students were slightly (50–79 score) addicted with a male students predominance. Our results are in agreement

Level of Addiction	Range score	Male	Female	Total
Mild user Facing average problems	20 – 49	28	18	46
Moderate internet user Facing frequents problems	50 – 79	21	32	53
Internet addict Facing significant problems	80 – 100	01	0	01

Table 1. Internet addiction test among medical students

Items	Major priority	Average priority	No priority
Communicating with friends and families	71	20	09
Education and learning activities	54	29	17
Reading news	25	43	32
Learning computer applications	30	34	36
Watching moves and songs online	62	25	13
Playing online games	29	29	42
Internet shopping	18	39	43
Writing weblogs	12	24	64
Uploading /downloading exploiting videos and images	32	30	38
Scientific search	30	44	26
Email checking	26	38	36
Chatting with new people	30	35	35
Solicitation	13	19	68

Table 2. Purpose of internet use regarding its priority

	Excellent 90 and above	Good Between 70 – 90	Average Between 50 – 69	Poor Between 30-49	Very Poor Below 29
Male	03 (3%)	20 (20%)	19 (19%)	05 (05%)	03
Female	03 (3%)	29 (29%)	12 (12%)	05 (05%)	01

Table 3. Frequency distribution of items of Mental Health Scale

with a number of studies who showed that men are more susceptible than girls[15-17]. The higher incidence of IA in our study is related to more social freedom in males, more friends in cyberspace and more membership in chat social network. These results are not consistent with Rogers et al[18] who reported excessive use of the Internet among female to update information, access knowledge, and contact with friends and family, spend leisure time, and online shopping, while a study done by Vyjayanthi et al[19] reported equal amount of Internet usage among both sex groups.

In our study 46 students were mild internet user facing average problems due to internet use, 53 student were using internet frequently and one student was found to be internet addict facing academic performance. Our results are in consistent with a number of studies[20, 21] who showed that the Internet addiction has negative affect on academic performance and is associated with poor mental health due to Internet overuse for purposes other than studies, however, there are studies who reported that Internet addiction does not affect students' academic performance or Internet addiction[22].

Mental health, is a state of well-being in which the person realizes own potential, the abilities which he or she can cope with the normal stresses of life, can work productively and fruitfully, and can make a contribution to the community. The IA leeds the person towards power mental health and decreases the student academic performance[21, 23].

Our results showed majority of the student prioritized Internet use for communicating with their friends and family members, watching movies and songs on line and for learning activities to update their knowledge. These results are consistent with a similar study[24] conducted among adults from Taiwan and students of Guilan[25]. While in the study done by Ansari et al[26], there were no statistically significant relationships. The stress arisen in the students as a result of far from their home and family members, fill their loneliness and compensation for mental support feelings of loneliness they may indulge in and spending more time on the internet[27] showing that a lack of psychological support cause students to overuse the internet. Our results showed least internet usage for solicitation, writing weblogs, internet shopping and playing online games.

CONCLUSION:

In our study we found major use of internet was for communication with their family and friends, entertainment and for academic purposes. The problem experienced by the medical students due to their Internet use came out to be lack of proper sleep, poor mental concentration towards their studies and poor academic performance.

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Original Article

Clinical Assessment Of Bonding Agent v/s Fluoride Varnish In Dentinal Hypersensitivity

Jamshed Ahmed, Syed Abrar Ali, Rizwan Jouhar , Haroon Shah

ABSTRACT:

Objective: To compare the mean reduction in pain scores between Bonding agent (GLUMA® Comfort® Bond+ Desensitizer, and Fluoride varnish.

Methodology: The study was conducted at Operative Dentistry, Department at Altamash Institute of Dental Medicine, Karachi from July 2015 to August 2016. Total 152 patients were selected. Patients were randomly allocated into two groups A and B. Gluma comfort bond plus desensitizer® was applied to the patients in group A and Duraphet® was applied to the patients in group B. Initial assessment was done after the application of the above products and thermal test was performed. The outcomes were based on a Visual Analogue Scale (VAS). Re-Evaluation was done again after 30 days of treatment in terms of mean reduction in pain from baseline by applying thermal test on visual analogue scale.

Results: The average age of the patients was 37.4 ±8.38 years. After 30 days, mean Visual Analog Scale was significantly low in Group A i.e. 2.95±0.0.86 as compared to Group B i.e. 4.01±0.79(p=0.0005). Significant more reduction in mean pain score was observed in Bonding agent (Gluma desensitizer) as compared to Fluoride varnish Duraphat.

Conclusion: In our study we found that bonding agent (Gluma Desensitizer) is more effective in treating Dentine Hypersensitivity compared to fluoride varnish (Duraphat desensitizer group).

Key Words: Dentin hypersensitivity, Pain score, Bonding agent, Fluoride varnish.

INTRODUCTION:

Dentinal hypersensitivity is becoming more and more common these days. It can be diagnosed as short and sharp pain from exposed dentine in response to tactile, evaporative, chemical or thermal stimuli[1]. It is associated with condition like abrasion, attrition, erosion, abfraction, gingival recession and improper brushing habits[2,3]. Most common teeth are canines followed by first premolars, incisors, second premolars, and molars[4,5]. To explain dentinal hypersensitivity many theories has been proposed[3,4,8]. Most authentic theory is hydrodynamic theory of sensitivity. This theory proposed that fluid move rapidly within the dentinal tubules following stimulus application resulting in stimulation of sensory nerves in the pulp/inner dentin portion of the tooth[3]. According to one study, deficiency of cementum (CEJ) in 5% to 10% of teeth also resulted in exposed dentin and may contribute to dentinal hypersensitivity[6]. Moreover gingival recession, improper tooth brushing or periodontal therapy can also contribute to dentinal hypersensitivity[2-8]. Dentinal hypersensitivity can also be the result of scaling and root planning. The rationale of this study is to identify which treatment modality (Bonding agents or Fluoride varnish) gives better outcome in treating Dentine Hypersensitivity.

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Received: 14-03-18
Accepted: 05-12-18

METHODOLOGY:

The study was conducted at Operative Dentistry Department at Altamash Institute of Dental Medicine, Karachi from July 2015 to August 2016.A total of 152 patients was selected by eligibility criteria.

Patient with history of dentinal hypersensitivity having cervical erosive cavities and gingival recession were included in the stydy. Patient should have at least 20 natural permanent teeth and at least two teeth with a VAS score of =4 to be included in the study.

Teeth with caries, defective restorations, chipped teeth, deep periodontal pockets (probing depth >4mm), periodontal surgery within the previous six months, and subjects with orthodontic appliances or bridge work that would interfere with evaluation were excluded. Presence of occlusal overload or occlusal adjustment, any gross oral pathology, eating disorders, chronic disease were also excluded from the study sample, Patients were divided into two equal sized, random groups by lottery method. Gluma comfort bond plus desensitizer® (HeraeusKulzer, Hanau, Germany) was applied to the patients in group A, while Duraphat® (Colgate Oral Pharmaceuticals, New York) was applied to the patients in

group B. In group A. Each tooth which was sensitive was cleaned with a polishing paste, rinsed with water and air dried. The Gluma etch gel was applied for 20 seconds. Then it was rinsed, air dried and the tooth surface was moistened by pellets damped with distilled water. Gluma comfort bond plus desensitizer® was applied using a disposable brush applicator. Another coat was applied and then it was light cured for 15 seconds.

In Group B every target sensitive tooth was cleaned with a polishing paste, rinsed with water and air dried. Disposable brush applicator was used to apply Duraphat®. A second coat was applied after 5 minutes. Patients were recalled after 30 days of the treatment and visual analogue scale was used by applying thermal test.

The data analysis was carried out using SPSS (version 19). Mean and standard deviation was calculated for age, pain score at baseline and after 30 days. Mean reduction in pain score was presented in standard deviation. Frequency and percentage was calculated by gender. T-test was applied to compare the mean reduction in pain score in both groups. Stratification with respect to age and gender was done. Post stratification t-test was applied. The p value = 0.05 was considered to be statistically significant.

RESULTS:

Mean age of the patients was 37.4 years. There were 53(34.9%) male and 99(65.1%) female patients (Figure1).

The mean VAS for pain was 7.26±0.57 for group A and 7.29±0.51 for group B at the baseline. Mean difference was not significant between groups at baseline. After 30 days, Mean VAS was significantly low in Group A as compared to Group B [2.95±0.0.86 vs. 4.01±0.79 p=0.0005]. Mean reduction in pain score level of gluma desensitizer was 4.32± 0.94 while in duraphet group it was 3.22± 1.02. Significant more reduction in mean pain score was observed in Gluma desensitizer as compared to Duraphet as shown in table 1.

Stratification analysis was also performed and observed that mean VAS reduction was also high in group A as compared to group B for below and equal to 40 years of age patients and above 40 years of age patients as shown in table 2 and 3 respectively. Similarly reduction was also observed in group A for male and female cases as shown in table 4 and 5 respectively.

DISCUSSION:

Hypersensitivity of dentine is very unpleasant experience perceived by patients. It is a highly painful activity resulting in unusual habits like tongue protecting sensitive teeth, avoidance in eating from that side of the mouth and complete elimination of cold hot and drink and food. The quality o flife is greatly compromised. It's difficult for the patient to describe the condition and similarly very difficult to diagnose the exact cause and subsequent management[3].

The cause of dentinal hypersensitivity may be hot and cold stimulus. Tactile sensation and evaporation can also result in increasing hypersensitivity[9,10]. Since 1935 –Grossmann

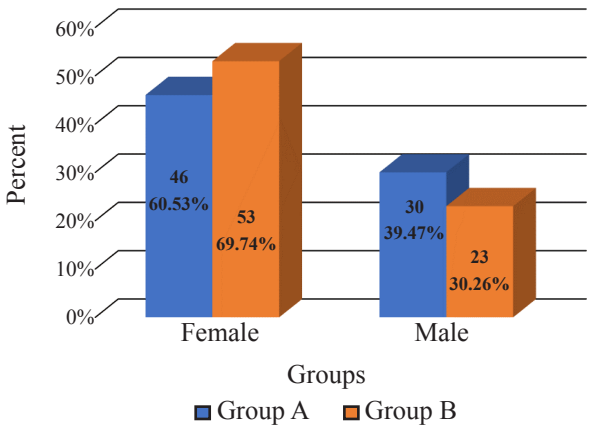

Figure 1: Gender Distribution of the Patients With Respect To Groups (n=152)

Pain Score at different time	**Group A n=76**	**Group B n=76**	**P-Value**
At Baseline	7.26±0.57	7.29±0.51	0.76
After 30 days	2.95±0.0.86	4.01±0.79	0.0005
Reduction in pain score	4.32±0.94	3.22±1.02	0.0005

Table 1: Comparison of Mean Pain Score between Groups Independent sample t test

Pain Score at different time	**Group A n=48**	**Group B n=59**	**P-Value**
At Baseline	7.29±0.62	7.27±0.48	0.84
After 30 days	2.96±0.0.96	4.02±0.0.84	0.0005
Reduction in pain score	4.33±1.07	3.22±1.08	0.0005

Table 2: Comparison of mean pain score between groups for age = 40 years of age
Independent sample t test

Pain Score at different time	**Group A n=28**	**Group B n=17**	**P-Value**
At Baseline	7.21±0.49	7.35±0.61	0.41
After 30 days	2.93±0.66	4.00±0.61	0.0005
Reduction in pain score	4.29±0.65	3.24±0.83	0.0005

Table 3: comparison of mean pain score between groups for age above 40 years of age
Independent sample t test

Pain Score at different time	**Group A n=30**	**Group B n=23**	**P-Value**
At Baseline	7.10±0.31	7.13±0.34	0.73
After 30 days	2.97±0.99	3.78±0..60	0.001
Reduction in pain score	4.13±1.07	3.26±0.75	0.002

Table 4: comparison of mean pain score between groups for male patients
Independent sample t test

Pain Score at different time	**Group A n=46**	**Group B n=53**	**P-Value**
At Baseline	7.37±0.68	7.36±0.56	0.93
After 30 days	2.93±0.77	4.11±0.0.84	0.0005
Reduction in pain score	4.43±0.83	3.21±1.13	0.0005

Table 5: comparison of mean pain score between groups for female patients
Independent sample t test

developed a agent to treat dentinal hypersensitivity, which is non irritant, easy to use, gives immediate result , relatively cheap with long term effect . A review by Markowitz and Pashley proposed that new desensitizing agent should treat the root causes with managing sensitivity as well[11].

In this study 152 patients were divided into two groups A ans B. There were 53(34.9%) male and 99(65.1%) females. Our data shows that women are more vulnerable to hypersensitivity of dentine .A hypothesis was given that female visits the dentists more often and follow hygiene instructions more often than males[12,13]. In our study age of the patients ranges from 20-60 years and the average was 37.4 ±8.38 years. A similar study by Cummins who demonstrated that, dentine hypersensitivity can present at any age but the majority of individuals range in age between 20 and 50 years with a peak in prevalence in the age range 30-39 years.[14]

In our study Gluma comfort bond plus desensitizer was applied to the patients in group A and Duraphat was applied to the patients in group B. The mean VAS for pain was 7.26±0.57 for group A and 7.29±0.51 for group B at the baseline. Mean difference was not significant between groups at baseline. After 30 days, mean VAS was significantly low in Group A as compared to Group B [2.95±0.0.86 vs. 4.01±0.79 p=0.0005]. Mean reduction in pain score level of guma desensitizer was 4.32± 0.94 while in Duraphet group it was 3.22± 1.02. Significant more reduction in mean sensitivity score was noted in Gluma Desensitizer when we compared it to Duraphet. Gluma contains glutaraldehyde which occludes dentinal tubules and develops coagulation inside the dentine tubules, because of precipitation of serum albumin[15,16]. Studies outcomes show a mark decrease in dentine hypersensitivity[17,18,19], but other studies contradict these results[20,21]. Aranha et al.[22] in his study concluded that an instant effect was seen after application of Gluma Desensitizer and Seal & Protect. Fluoride compound application in higher concentration can reduce dentinal hypersensitivity which might be due to deposition of calcium fluoride globules within the dentine tubules[23]. Ghaffar et al concluded in their research that, professionally-applied high-fluoride products, including fluoride varnish (22,600 ppm fluoride) have been shown to greatly reduce dentine hypersensitivity following just one application[24].

CONCLUSION:

Clinician find dentinal hypersensitivity very challenging to treat effectively. Patient education regarding managing this condition is of prime importance. With newer materials better option are available to treat the patient but to identify the real cause is of utmost importance in long term success. In our study we found that group in which bonding agents were used was more effective with a mean reduction in pain score level of 4.31± 0.94 while in the group which used fluoride varnish group it was 3.22± 1.02. A good clinician should have sound knowledge of latest materials available to treat the condition of dentinal hypersensitivity.

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Original Article

Incidence And Risk Factors Of Maternal And Fetal Outcomes Among Patients Of Placenta Previa With And Without Placenta Accreta

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ABSTRACT:

Objective: The aim of the study was to evaluate maternal and fetal outcomes among patients of placenta previa (PP) with and without placenta accreta (PA).

Methodology: All patients who underwent cesarean section for PP and PA were analyzed retrospectively at a tertiary care Combined Military Hospital Kharian, Pakistan, from February 2015 to March 2018. Maternal and neonatal data were obtained from medical records and the hospital database system.

Results: PA was found in 37 patients from 111 patients of PP and 74 were without PA with the rate of approximately 2/1000 and 4/1000 respectively were included in the study. The mean age was 31.16±2.65 (range 22–37) years, mean gravidity of 3.69 ±1.40 (range 1 - 9), mean parity 2.57±1.01 (range 1–5), mean number of cesarean sections 2.10±0.66, (range 1-3) and a mean gestational age at the time of cesarean section was 35.65±2.46 (range 28–41) weeks. The maternal risk factors revealed marked differences between placenta previa with accreta and without accrete. The mean intraoperative blood loss in PA was 3,000ml, with a loss of 2,000ml occurring in 60%, and 3,000 ml in 21% of the PA cases. The mean pRBC transfusion was 4 units, while 17% received 6 units. Fetal growth restriction was not seen. A total of 12 neonates were admitted in NICU, with 03 neonatal deaths. There was no maternal death. Neonates born to women with placenta accreta had significantly lower birth weight, Apgar scores at 1 min and 12% required admission to NICU with 3 neonatal deaths.

Conclusion: The advanced maternal age, past cesarean or uterine surgery, high parity as well as multiple gravidity were the risk factors for adverse fetal and maternal outcomes.

Key Words: Placenta previa, Placenta accreta, maternal outcome, Neonatal outcome.

INTRODUCTION:

Hemorrhage and the hypertensive disorders are the primary cause of maternal morbidity and mortality in the developed and developing world. The placenta accreta and its related pathologies are the leading cause of maternal hemorrhage and cesarean hysterectomy[1]. The PA defined as the placenta being adherent to the uterine wall without easy separation; was confirmed by clinical assessment, gray scale ultrasound done, evidence of gross placental invasion at the time of surgery or by pathologist proving adherence of placental villi to the myometrium without intervening decidua basalis[2].

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Received: 31-07-2018
Accepted: 21-12-2018

Deficiency of decidua basalis at the endometrial scar is thought to be the cause of placenta accreta. The decidual or trophoblast induced vascular remodeling are such disturbed that the myometrium is invaded deeply by the trophoblast. These larger diameter vessels conduct a greater blood volume than the smaller diameter spiral arteries, resulting massive intrapartum hemorrhage associated with high maternal morbidity and mortality at time of placental removal[2, 3]. The extreme variants of accreta include increta and percret. The risk factor for placenta accreta includes lower uterine segment implantation, damage or scarring due to dilatation and curettage (D&C) and myomectomy[4, 5].

The placenta accreta has increased the rate of cesarean section by 10 folds since 1950s,[6] the current rates range from 1/533 to 1/7000 live births in developed countries resulting a mortality rate of approximately 7% [1] however, other reasons to increase in cesarean delivery include assisted reproductive technology and older maternal age[6]. Ultrasound findings suggestive of placenta accreta include, loss of normal hypoechoic retroplacental zone, retroplacental myometrial thickness of <1mm, "swiss cheese" appearance, numerous coherent vessels and blood vessels or placental

tissue bridging uterine-placental margin, myometrial-bladder interface, or crossing the uterine serosa[7, 8].

Multidisciplinary team planning is required for mode of delivery as the uterine surgery may compromise future fertility, or radiological interventions to reduce maternal and neonatal morbidity[9]. The aim of the study was to evaluate maternal and fetal outcomes among patients of placenta previa (PP) with and without placenta accreta (PA).

METHODOLOGY:

This study was carried out in CMH Kharian Pakistan after taking approval from the ethical committee of the hospital. The hospital records from February 2015 to March 2018 were assessed and all patients who underwent caesarean section were included in the study. The patient age, years since married, gravidity, parity, gestational age at time of cesarean section, ultrasound (placental position) and history of previous cesarean section(s) were collected. The evaluation also included mode of delivery whether hysterectomy or cesarean section was done electively or in emergency, placenta removed or not were included. Maternal outcomes or morbidity included estimated blood loss during surgery and units of packed red blood cell transfusion given with any transfusion complication. The blood loss was calculated from the number of gauze pads soaked with blood during the surgery. The morbidity also included postpartum anemia, post-surgical infection, urinary tract injuries, psychological illness and cesarean hysterectomy. Data pertaining to neonatal outcome included gender, birth weight, Apgar score at 1 and 5 min, need for admission to NICU and any neonatal death were also recorded. In this hospital; surgeries for PA was managed by the obstetric consultant and a second consultant as emergency handling. The woman with PA was also evaluated prior to surgery by the urologist for insertion of a ureteric stent if required and by the vascular surgeon. Communication with blood bank personnel for supply of blood and blood products was also made forehand. The elective cesarean section was planned at 36–38 weeks if PA was suspected. All this data was recorded in SPSS version 23 and descriptive analysis was performed for all demographic variables, to find the association chi square was performed to assess various neonatal and maternal outcomes. P value <0.005 was statistically significant.

RESULTS:

A total of 111 patients with Placenta Previa (PP) were included in the study with the rate of 6/1000 from the total 18000 deliveries performed during the study period. The PP was confirmed on operative findings, complete PP was noticed in 65 cases, partial in 24 cases, marginal in 17 cases and low lying PP in four cases. PA was found in 37 patients from 111 patients of PP and 74 were without PA with the rate of approximately 2/1000 and 4/1000 respectively were included in the study. The mean age was 31.16±2.65 (range 22–37) years, mean gravidity of 3.69 ±1.40 (range 1 - 9), mean parity 2.57±1.01 (range 1–5), mean number of cesarean sections 2.10±0.66, (range 1-3) and a mean gestational age at the time of cesarean section was 35.65±2.46 (range 28–41) weeks. Majority of the patients 76(68.4%) were reported in OPD and 35 patients (31.6%) were brought in ER. Elective cesarean section was done in 52 patients (46.8%) while emergency cesarean section was performed in 59 (53.2%) patients. Nearly 21(57%) of PP patients with PA and 31(42%) of PP patients without PA underwent planned cesarean section while16 (43%) and 43(58%) of PP patients with and without PA underwent emergency cesarean. An estimated 10(27%) of PP with PA had cesarean with hysterectomy so their fertility was not preserved. Cesarean hysterectomy was done in 17(15.3%) patients from which 10(27%) were performed in PP patients with PA and 7(9.5%) in PP without PA. Previous history of cesarean section was found in 37(69.4%) in PP with PA and 11(30.6%) in PP without PA patients in this study. The statistically significant difference was observed while assessing the organ damaged in PP patients with PA and without PA which was 6(16.2%) and 19(25.7%) respectively.

The data of this study revealed statistically significant difference in degree of Previa, injury to urinary system, number of previous Cesarean and DIC while comparing two cohorts of PP with PA and PP without PA and the calculated P-value was 0.0001, 0.004, 0.0001 and 0.0001 respectively. Table-1.

The blood loss assessed in entire population was 1350ml average, from which 500 to 999 ml occurred in 11 patients (9.9%), 1000 to 1999ml occurred in 67 cases (60.4%); 2000–3000ml in 24 (21.6%); and >2,000 ml occurred in 09 (8.1%) of the cases. The mean PRBC transfusion requirement was up to one pint in 09 (8.1%) patients, 1–2 units in 52(46.8%) patients, 2–3 units in 19(17.2%) patients. The blood loss was more in patients of PP with PA compared to those without PA. The bleeding was controlled mostly by ligations of internal iliac artery or bilateral uterine artery ligation. Urinary tract injury occurred in 47(42.3%) patients, 32 (28.8%) patients showed psychological effects, 09 (8.1%) suffered from renal tubular necrosis, and 03 patients3 (2.7%) suffered disseminated intravascular coagulation (DIC). There was no maternal mortality.

For evaluating the fetal outcomes; a statistically significant result (p=0.0001) was observed while evaluating weight of neonate at different gestational age among patients of PP with PA and without PA. A similar trend was observed when neonate Apgar score was compared at 01 minutes (p=0.0001) and at five minutes it was (p=0.109) among both groups of PP patients with PA and without PA.(Table-2)

To assess the correlation between various neonatal and maternal outcomes; a significant positive correlation was observed between gestational age and neonatal weight (r=0.614, P= 0.0001) and with Apgar score at 5 minute (r=

Degree of previa				
Type 1 (low lying)	04 (3.6%)	0 (0%)	04 (5.4%)	0.0001*
Type II (marginal)	17 (15.2%)	0 (0%)	17 (23%)	
Type III (partial)	25 (22.6%)	03 (8.1%)	22 (29.7%)	
Type IV (complete)	65 (58.6%)	34 (91.9%)	31 (41.9%)	
Injury to urinary system				
Yes	47 (42.3%)	23 (62.2%)	24 (32.4%)	0.004*
No	64 (57.7%)	14 (37.8%)	50 (67.6%)	
No. of previous cesarean				
Nil	75 (67.6%)	12 (32.4%)	63 (85.1%)	0.0001*
1	16 (14.4%)	11 (29.7%)	05 (6.8%)	
2	14 (12.6%)	10 (27%)	04 (5.4%)	
3	06 (5.4%)	04 (10.8%)	02 (2.7%)	
DIC				
Yes	03 (2.7%)	01 (2.7%)	02 (5.4%)	0.0001*
No	108(97.3%)	36 (97.3%)	72 (87.3%)	
Placenta removed				
Yes	19 (17.11%)	07 (18.9%)	12 (16.2%)	0.791
No	91 (82.9%)	30 (81.1%)	62 (83.3%)	
PP anemia				
Yes	70 (63.1%)	26 (70.3%)	44 (59.5%)	0.302
No	41 (36.9%)	11 (29.7%)	30 (40.5%)	
Renal Tubular necrosis				
Yes	09 (8.1%)	02 (5.4%)	07 (9.5%)	0.715
No	102 (91.9%)	35 (94.6%)	67 (90.5%)	
Psychological effects				
Yes	32 (28.8%)	11 (29.7%)	21 (28.4%)	0.240
No	84 (71.2%)	31 (70.3%)	53 (71.6%)	

Table 1: Maternal outcomes among patients of PP with PA and PP without PA

Variable	N=111	PP with PA	PP without PA	P-value
Weight	2.64±0.39	2.50±0.41	2.72±0.37	0.007
1-minute Apgar score	6.93±1.10	6.37±1.34	7.21±0.84	0.000
5-minute Apgar score	8.60±1.16	8.35±1.27	8.72±1.10	0.109
NICU Admission	12 (10.8%)	07 (18.9%)	05 (6.8%)	0.060
Death	03 (2.7%)	02 (5.4%)	01 (1.4%)	

Table 2: Neonatal outcomes of Placenta Previa (PP) patients with PA and without PA

		Gestational age	Neonatal weight	Apgar score 5 minutes	Parity	Apgar score 1 minutes	Previous cesarean section
Apgar score 5 minutes	P. Correlation	.277**	.373**	1	-.356**	.648**	-.316**
	P-value	.003	.000		.000	.000	.001

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

Table-3: Pearson's Correlation between Gestational and Neonatal Outcomes

0.277, P=0.003). The previous cesarean sections showed significant negative correlation with gestational age (r= -0.227, P=0.017), neonatal weight (r= -0.366, P=0.0001) and with Apgar score 5 minute (r= -0.316, P=0.001). Apgar score 1 showed a positive correlation with 5-minute Apgar score (r=0.648, P=0.0001) while a negative correlation was

noticed with parity (r =-0.258, P=0.006). (Table-3).

DISCUSSION:

Our results showed significantly increased maternal morbidity in patients of Placenta Previa PP with PA and are in consistent with a number of studies[3,9- 12]. The women are at great risk with previous cesarean delivery, rate of previous caesarean section, short interval between caesarean section and conception, and massive obstetric hemorrhage[13-15].

Our result showed mean 1500 ml blood loss as a result of PA in 78 (69%) cases, in addition, mean PRBCs transfused packed red blood cells required was 3 units. These results are in agreement with Wright et al who reported a median blood loss of 1500 ml and a median PRBCs transfusion requirement of 4 units in 77 patients undergoing hysterectomy for PA[14]. Wright et al reported a mean of a median of 4.5 units transfused in patients with PA. it is now globally accepted that patients with PA should undergo surgery by experienced multidisciplinary surgeons team with urologists, general Surgeons, gynecologic oncologists, and an interventional radiologist or at least a second obstetric consultant to take rapid action to control bleeding and in taking decision for hysterectomy must be present where facilities of other specialties are not available to minimize maternal and neonatal morbidity and mortality[16-19].

About 90% patients of PP with PA and 89% of PP without PA were diagnosed on Gray scale ultra sonography that had a sensitivity of 77%–87%, specificity of 96%–98%, positive predictive value of 65%–93%, and a negative predictive value of 98%. Overall gray scale is sufficient and more sensitive to color Doppler or power Doppler to diagnose PA[20-22]. MRI though costly and require experience and expertise but help in clarification of suspected cases of PA. In our study 9% cases of PP were diagnosed by MRI.

Our results showed that patients with PA have greater age, gravidity and parity than without PA. The results are in agreement with Dandanet al[23] who reported that Placenta Accreta grows stronger as parity increases even if the numbers of cesarean sections are kept constant. Surraya et al[24] observed parity as an independent factor for PA in his study. A significant increased number of previous cesarean section in patients with PA compared to patients in the absence of PA was seen in our result which were in agreement with a number of studies resulted in increased possibility of PA with increased and subsequent deliveries whether vaginal or cesarean. As the rate of PA rises with rising cesarean rates since the last few decades therefore, the rate of primary and repeated cesarean sections should be decreased without increase in maternal-fetal morbidity and mortality. By reducing cesarean section and encouraging vaginal delivery after cesarean section with counseling the patients explaining the complications of repeat cesarean section can improve the situation in PA[15,25-27].

In our study 27(73%) cases of PP with PA and 36 (48%) cases of PP without PA underwent cesarean section. To significantly improve fetal maturity and to decrease fetal morbidity, the pregnancy should be carried as close to full term as possible. An elective surgery was done in 47% of patients with PA in our study, an attempt to avoid emergent surgery as some institutions justify elective surgery at 34–35 weeks to decreased neonatal morbidity[28-30].

In our study no neonate was small for gestation, however, half of our patients belonging to PA delivered before 36 weeks and more than 17% of newborns were admitted to the neonatal intensive care unit out of which 3 babies died. Our results are in consistent with Offer et al[31] who showed that not only females with placenta accrete had 75% preterm birth rate and were managed with planned caesarean section; but the preterm birth rate was also much higher among those with PP. [33]

A study carried out at Civil Hospital Karachi[32] reported neonatal mortality rate of 14% for placenta previa patients with maternal mortality of 2%, while a study done at Hameed Latif Hospital Lahore[4], reported 23.38% neonatal mortality in cases of PP. The neonatal complications associated with PP patients include respiratory distress syndrome and congenital anomalies. A low 1-minute Apgar score but an improved 5-minute Apgar score, an increase in neonatal weight with increase in gestational weeks in our results are in association with other studies.

CONCLUSION:

It is recommended that PA should be excluded in every case of PP to decrease the risk of feto-maternal morbidity and mortality. Planned delivery and intervention is necessary by multidisciplinary specialist team for women with placenta accreta.

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Review Article

Willingness To Pay And Its Role In Health Economics

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ABSTRACT:

A stated preference which refers to the valuation of benefits in monetary terms to the health-related commodities or services are loosely termed as willingness to pay (WTP). Studies in health economics which are derived by surveys or experiments have been conducted addressing this issue. However, most economists have the view that stated preference or willingness to pay is an acceptable method if inclined with the aims of economic analysis. There has been a rapid growth of the health industry in the last few decades to meet the healthcare needs of an ever-growing population of the world with varying patterns of burden of disease and health related issues. This has escalated healthcare costs significantly putting pressure on governments to allocate additional finances in the health sector. In developing nations and some developed countries health services are mostly purchased privately as the governmental annual health budgets struggle to meet the healthcare demand of the communities.

Its relevance is increased in countries where people are expected to contribute significantly towards the costs of healthcare. Similarly, the strength of preference of health-related commodities is an important indicator for making prudent choices in deciding between competing health program which may be publicly funded. Moreover, other advantages of using WTP as outcome measure include; demand for information, process utility, option value and altruistic value. Demand for information encompasses the utility gained by individuals from the information included in the WTP survey. To conclude willingness to pay methodology is a useful tool in health economics to capture the preference of individuals who are the direct beneficiaries of the proposed health services.

INTRODUCTION:

'Willingness to Pay' (WTP) instruments as defined by Donaldson measure 'strength of preference' for, or value of, a commodity. In healthcare sector the conventional markets do not exist particularly in welfare states as either health services are provided free or heavily subsidized[1, 2]. Yet important decisions have to be made pertaining to allocation of scarce resources. Therefore, it is important to attribute valuation to resource costs for health interventions and its associated benefits. 'Hypothetical WTP questions in healthcare are utilized to elicit community values to choose combination of interventions which maximizes the value of benefits to the community[3,4]. A stated preference which refers to the valuation of benefits in monetary terms to the health-related commodities or services are loosely termed as WTP studies in health economics which are derived by surveys or experiments. The technique of measuring valuation is by offering people an opportunity to give direct values or providing them hypothetical market scenarios to document their responses[5,6]. Morris explains that the theoretical basis of stated preference is psychological which is often disagreed by extreme views associated with Austrian economics which state that choices in real market have relevance to economic analysis. However, most economists have the view that stated preference or willingness to pay is acceptable method if inclined with the aims of economic analysis. Olsen explains that one of the greatest challenges for publicly financed health services is the setting of priorities among competing healthcare programs. He further comments that non- health benefits derived from healthcare beyond the benefit derived from health outcome are important to acknowledge in economic evaluations. To capture such non-health benefits derived from healthcare WTP becomes more appropriate than just a Quality Adjusted Life Year calculated in cost utility analysis[7].

There has been an increased number of WTP studies conducted in healthcare in recent decades. The two methods that have been employed include contingent valuation method and discrete choice experiments. The relevance of WTP studies and cost benefit analysis (which incorporates WTP to measure monetary benefits)[8,9,10] is more in countries which greatly rely on private health services based on health financing by patients themselves. In countries like UK where health services are mostly provided free or significantly subsidized conducting these studies can be challenging[11]. For example, it is unethical for researchers to imply future costs on services which are provided free at present. However, in developing nations and countries where patients bare most of the cost of health-related expenses WTP studies, particularly contingent valuation studies have been conducted.

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Received: 02-11-18
Accepted: 11-12-18

These studies have more relevance to the functioning of health systems within these regions. Some examples include; WTP study conducted to measure willingness to pay for social health insurance among informal sector workers in China, cross border insurance health insurance between Mexico and USA; quality healthcare and willingness to pay for health insurance retention in slums of Kolkata India. Moreover, Neumann states that WTP surveys facilitate researchers to broadly investigate the health and non-health benefits of predictive tests. Neumann elaborates that WTP literature in healthcare in last few decades has encompassed different disease areas, treatment modalities, and survey methods[12,13,14].

However, there are potential weaknesses associated with WTP methods. The commonly discussed in literature include the relatively under sensitive responses generated in WTP and inflation of valuation of a specific intervention. The under sensitive responses generated in WTP refer to the scope effects and nesting effects which over sights the attributes of a single commodity. Kemp as cited by Cookson describes inflation of valuation of a specific intervention as 'WTP methods tend to inflate valuations of the specific intervention that respondents are asked about, relative to interventions that respondents are not asked about'. Furthermore there are other biases associated with generating responses in WTP which will be discussed in detail in the section weaknesses and limitation of WTP methodology in health economics[15,16].

The essay will broadly cover the following themes in an attempt to critically assess the application of WTP methodology in health economics; 'WTP studies in healthcare: A Global Perspective', 'Advantages of WTP Methodology', 'Weaknesses and limitations of WTP', 'Methods of collecting WTP information in Healthcare' and 'Brief overview of the recent advances in WTP and Cost benefit analysis in Health Economics'.

WTP studies in Healthcare: A Global Perspective:

There has been a rapid growth of the health industry in last few decades to meet the healthcare needs of an ever-growing population of the world with varying patterns of burden of disease and health related issue[17]. This has escalated healthcare costs significantly putting pressure on governments to allocate additional finances in the health sector. In developing nations and some developed countries health services are mostly purchased privately as the governmental annual health budgets struggle to meet the healthcare demand of the communities. In such circumstances setting priorities among competing health programs is a daunting task. It is important to consider the non-health benefits derived from healthcare and valuing societal preferences in context to their willingness to pay. In such conditions WTP becomes more relevant than just considering a Quality Adjusted Life Year during decision making. As stated by Olsen 'from a consumer sovereignty perspective, WTP is superior to QALYs in that no restrictions are imposed on which attributes of a health care programme people are allowed to value'[18,19]. Moreover, public health interventions are aimed generally for achieving long term health outcomes. Planning and implementation of preventive health programs require valuation of both health and non-health related benefits of the proposed interventions. It can be argued that cost benefit analysis including WTP has the welfare economics theoretical basis to substantiate the economic evaluation for decision making in publicly funded healthcare. [20] Cost benefit analysis utilizing WTP aims to capture allocative efficiency ensuring that sum of all health gains are distributed in an equitable fashion. WTP studies have been reported globally addressing issues such as; public sector healthcare programs, health financing schemes, measuring health state improvement, health insurance retention, cross border health insurance, implementing preventive public health interventions, social health insurance of informal sector workers, WTP to lessen waiting times for health procedures, WTP for child survival and health related safety strategies. As substantiated by the studies quoted above health systems where patients have to bare most of their health costs obtaining WTP information is beneficial in decision making process pertaining to healthcare service delivery. By obtaining WTP values health services can be offered at costs which are acceptable to the target populations to achieve improved health outcomes. The health insurance schemes based on WTP are a good example where individuals can be included in health coverage in accordance with the weight of their stated preferences. Countries like UK where health services are provided free of cost or greatly subsidized WTP studies may be difficult to conduct as the participants would find difficulty in relating to the hypothesized market scenarios present in the contingent valuation approach. Therefore, the information obtained by cost benefit analysis is of limited use and policy recommendations by health governing body such as National Institute for Health and Care[21] Excellence greatly relies on QALYs calculated in cost utility analysis in decision making. It can be argued that careful consideration and inclusion of information obtained from WTP along with QALYs can substantiate the decision-making process. This may be achieved by incorporating both the non- health benefits of health outcomes associated with interventions and stated preferences of the consumers advocating broader benefits of healthcare.

METHODOLOGY:

Literature search of material was done by using PubMed.com, the keywords used were willingness AND to Pay AND Health Economics

LITERATURE REVIEW:

Methods of collecting WTP information in healthcare:

There are two general approaches by which WTP can be assessed, namely, indirect and direct method. In indirect

approach takes into consideration previous real life examples of trade offs between monetary values and associated health outcomes. On the contrary, the direct approach involves conducting surveys by providing hypothetical market scenarios to generate stated preferences or WTP[1,2 18, 22]. This technique as previously discussed is termed as contingent valuation approach and is often implied in cost benefit analysis pertaining to healthcare. There are four ways discussed in literature how researchers may question respondents to register their WTP. Open-ended or continuous response question provides opportunity to respondents to state whatever value they want. This technique is simple but far stretched from real life market where consumers don't have the liberty to state a price of a good and receive it. Discrete choice or binary choice respondents are given a single value which they can accept or reject. Different values are presented randomly to different individuals in a sample to generated WTP values based on average responses from the entire sample. Payment scale involves providing respondents with a range of choices and iterative bidding allows the flexibility of raising and lowering an initial value by the respondent till the point they are unable to decide[8,14,23].

Advantages of WTP Methodology:

A salient feature of WTP methodology for economic evaluation is that it is supported by a theoretical foundation in welfare economics. As highlighted by Birch (2003) 'methods used to measure QALY share their theoretical roots with welfarist valuation method such as willingness to pay'. WTP captures wider benefits of health which include the non-health benefits of associated health outcomes and acknowledges people preferences during the decision-making process. Its relevance is increased in countries where people are expected to contribute significantly towards the costs of healthcare[22,23]. Similarly, the strength of preference of health-related commodities is an important indicator for making prudent choices in deciding between competing health program which may be publicly funded. Moreover, other advantages of using WTP as outcome measure include; demand for information, process utility, option value and altruistic value[23]. Demand for information encompasses the utility gained by individuals from the information included in the WTP survey. Whether it may be a hypothetical scenario presented in a contingent valuation approach or attributes of two different health services or commodities the information provided facilitates individuals in making informed decisions. Therefore, utility is gained by having access to relevant information pertaining to the health services. Process utility includes the advantage of utilizing value in health care or the process of care received by using WTP as an outcome measure. Option value refers to the utility gained by individuals pertaining to the increased awareness of the health care proposed in the survey or experiment of WTP study. Furthermore, WTP can serve as a tool to measure how individuals value others welfare which is referred to as the altruistic value. The applied examples of these advantages are explained in detail in the previous section labelled, 'WTP studies in healthcare, a global perspective'[24].

Disadvantages and limitations of WTP methodology:

There can be potential bias in the information that is measured in WTP studies. For instance, in contingent valuation studies where participants are provided with hypothetical market scenarios may highlight the issue of the artificial nature of choices that respondents register[24]. In real life settings the consumers make choices that may be influenced by the environment in which they make the choice in context to the dynamics of the real life market conditions[23]. On the contrary, in an experiment or survey the participants may derive utility from interaction with the researchers rather than the providers. This may lead to strategic responses even from the most rational consumers depending on the scenario that is presented in the survey leading to under or over statement of the WTP[4,6,8]. It is more likely that the respondents may report a low WTP for an intervention based in the future and over state on a subsidized or free health intervention or service. Another important issue of generating validated responses from respondents may arise when they are unable to share researchers aim. The understanding of the health service and experience of previous utilization is important for respondents for reporting accurate WTP values. If they don't have a proper understanding of the service, its significance or previous experience of using it they may resort to face saving strategy by giving responses which are far from their actual stated preference. There are challenges associated with making market scenarios realistic[25]. Moreover, the process of giving WTP responses may also be cognitively demanding. Other issues that may arise in generating WTP values include protest bids in which respondents provide inaccurate responses expressing their disapproval of the present health governing systems or health policies rather than taking into consideration the proposed health service on its own. Responses provided by such subjects may invalidate the WTP response. Furthermore, respondents may also state no amount of WTP resulting in zero bids. Errors in the stated WTP by individuals when extrapolated can yield large errors in population WTP[25]. There is a potential risk of these inflated and sometimes referred as 'rubber money' valuations can be exploited by pressure groups and stakeholders with vested interests to deviate efforts to achieve rational decision making. The potential biases in collecting WTP values highlighted above raises questions on the authenticity of the information generated by this methodology in health economics and its reliability in aiding the decision-making process[4, 5, 16].

Brief overview of recent advances in Cost Benefit Analysis and WTP technique in Health Economics:

Despite the widespread use of incremental cost effectiveness

ratios in making important policy recommendations particularly in developed nations the absence of economic theoretical basis in the extra welfarist approach and the exclusion of non-health benefits by such methodologies is well debated in literature[17,18, 19]. There has been a rapid growth in the health sector with populations expected to pay for consuming health services in most of the countries. Therefore, in present times the assessment of cost benefit element of health services or interventions is very important specifically from a global health perspective. All economic evaluations have some element of 'cost-benefit' in them[26,27,28]. Cost benefit analysis (CBA) aims to capture all the associated costs and benefits of a health intervention comprehensively in monetary value. As stated by Mclntosh 'Recent methodological developments in monetary valuation for use in CBA are the development of the technique of willingness to pay, the use of conjoint analysis (CA) to elicit willingness-to-pay [29,30,31](WTP) values and advances in the debate on the inclusion of production gains in CBAs'. Furthermore, the balance sheet approach which is a form of cost benefit analysis emphasizes on the fact that benefits which cannot be quantified should not be ignored can be incorporated in[32] CBA in circumstances even monetary valuation is not possible. There has been a re-emergence of significance of CBA in context to increasing private health systems globally but its wider application in making policy recommendations remains debatable[33, 34].

CONCLUSION:

To conclude willingness to pay methodology is a useful tool in health economics to capture the preference of individuals who are the direct beneficiaries of the proposed health services. The monetary valuation of health benefits is of significant relevance in health systems where people have to contribute mostly towards the health costs incurred. Health insurance and financing schemes can be based on the WTP which can help include communities into wider health coverage. Preventive interventions can also be planned and prioritized by utilizing WTP to target high risk groups and choose between competing health programs. From a developed country's perspective where health services are provided free or heavily subsidized WTP can be considered along with incremental cost effectiveness ratios calculated in cost utility and cost effectiveness analysis. Similarly, a study reported to estimated WTP for one additional QALY gained to determine the threshold of the incremental cost-effectiveness ratio. However, there are potential weaknesses and bias in capturing WTP from respondents which can lead to false depiction of population willingness to pay once values are extrapolated. It is important to include all perspectives and aspects to make the most rational decisions pertaining to managing health resources. Health economics is an evolving field. The way forward would be an amalgam of the various techniques with careful consideration of associated strengths and weaknesses.

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Review Article

The Triad Of PCOS, Infertility And Metformin

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ABSTRACT:

Polycystic ovarian syndrome (PCOS) is now considered as a complicated disease of endocrine system. It is found in 5-10% of women of fertile age group. It was initially considered as a reproductive disorder in women. Studies in recent past have documented that PCOS is a metabolic syndrome and is influenced by genetic and environmental factors. It is also transferred genetically, an autosomal dominant trait with variable penetrance. Since role of insulin resistance has been identified as a main culprit in the development of PCOS therefore use of insulin sensitizers to treat PCOS seems logical. Insulin sensitizer such as metformin is a therapeutic option that targets not only insulin resistance present in this syndrome but several other aspects especially reproductive abnormalities such as infertility, which is a major problem of concern for women of reproductive age. This review attempts to cover the use of metformin in PCOS infertile women.

Key Words:: Polycystic ovarian syndrome, Reproductive abnormalities, Obesity, Insulin resistance, Infertility, Metformin

INTRODUCTION:

Polycystic ovarian syndrome (PCOS) is a metabolic syndrome that occurs in one out of seven women of reproductive age.[1] It is prevalent in 5-10% of women[2]. More than half of patients with PCOS have increased basal metabolic rate or are obese and are therefore at increased risk to develop obesity-related concomitant diseases[3]. PCOS is influenced by genetic and environmental factors too[4,5]. Pathophysiology of PCOS is multifocal either due to continuously rapid gonadotropin-releasing hormone pulses, hypersecretion of luteinizing hormone and inadequate secretion of follicle-stimulating hormone all take part to excessive production of ovarian androgen and disturbances in ovarian functions[6]. Insulin resistance is the main factor in development of PCOS. Insulin increases adrenal and ovarian steroidogenesis and inhibits liver synthesis of sex hormone-binding globulin[7]. In 2003, the Rotterdam Consensus Conference proposed that PCOS can be diagnosed, after the exclusion of other endocrine diseases, by at least two out of three following criteria: (1) clinical or biochemical hyperandrogenism, (2) oligomenorrhea or anovulation, and (3) polycystic ovary morphology[8].

PCOS is considered to begin during the pubescent[9,10]. In the first two years of life disturbances occur in menstrual cycle and ovulation during the start of menstruation (Twenty-five percent of girls in the first year of life, thirty- forty percent up to the third and fourth year). Complete pubertal development usually occurs in the first five years after the onset of menstrual cycle. Menstrual cycle varies from one female to another female, persistence of oligomenorrhea (menstrual cycles more than thirty five days), secondary amenorrhea (absence of menstrual cycles for more than three months) or primary amenorrhea, absence of onset of menstruation at 16 years of age[11] in girls with complete development of secondary sexual characteristics and good adult height, which indicate an excess of androgens levels in the blood[12]. Long duration of oligomenorrhea during pubescent at 14-19 years of age is indicated as the signs of persistent ovarian dysfunction in the future[13]. Acne on the center of the face and on the forehead is very common which is usually present during the adolescence period with increasing prevalence from 15 to 20 years of age, sometimes it become aggressive which also indicate sign of increased androgen levels in PCOS[14,15]. Alopecia is not considered as a common finding during pubescent, so it is not a common indicator of hyperandrogenism to rule out clinically. However in 65% of the patients during the adolescence period, hirsutism may be a good predictor of PCOS[16].

During the reproductive age group, it may cause failure in ovulation which is associated with increased risk of complications during pregnancy, such as abortions, gestational diabetes and preeclampsia[17]. Infertility and hirsutism are the two problematic conditions in a woman with PCOS that bring the women to the hospital. If we talk about infertility, there is hyperandrogenemia and excessive secretion of luteinizing hormone that can lead to menstrual disturbances, features of hyperandrogenemia and decreased fertility rate. Disturbances in menstrual cycles, such as oligomenorrhea or amenorrhea, are the initial feature of anovulation that is usually noticed by the doctor during the visit. Usually, these women will have increased number of small antral follicles on ultrasound and raised serum anti-mullerian hormone (AMH) concentration[18]. Insulin resistance, associated hyperinsulinemia, increased body mass index and obesity are significant issues of polycystic ovarian syndrome[19].

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Received: 25-10-18
Accepted: 07-12-18

These factors may play an important role in the pathogenesis of androgen excess and the susceptibility to develop earlier than expected glucose intolerance states and type 2 diabetes. Decreased insulin sensitivity causes the differentiation of pre-adipocytes to adipocytes, especially in the region of abdomen, which facilitate the deposition of fat and causes visceral-type obesity in women with PCOS[20].

Polycystic ovarian morphology can be detected on histopathology however clinically large number of cases of polycystic ovarian morphology are detected by transvaginal ultrasonography. Polycystic ovarian morphology is defined as at least one ovary and greater than 10 cm^3 ovarian volume (or 10 mL) or an increased number of antral follicles (i.e. those that can be visualized as cysts in the ovarian cortex measuring 2–9 mm in diameter). The exact number of antral follicles, that is the antral follicle count to establish the diagnosis of polycystic ovarian morphology using modern high frequency transvaginal ultrasonography probes is now at least 18 if not higher[21].

The first and most effective treatment of PCOS is life-style modification and weight loss[22]. Hormonal contraceptives are commonly used to reduce hyperandrogenic symptoms such as acne and hirsutism and to normalize the menstrual cycle[23]. In recent years' insulin-sensitizing drugs have been widely prescribed for PCOS patients. These drugs include Metformin, Pioglitazone, D-chiro-inositol. Metformin, a biguanide is proven to be effective not only for insulin resistance and body weight reduction but also for menstrual irregularity, anovulatory cycles, signs of hyperandrogenism and gestational complications[24]. Administration of metformin causes significant reduction in weight and successful ovulation in PCOS patients, within the time period of 3 months after start of treatment. Thus metformin produces spontaneous ovulation and better outcomes[25].

METHODOLOGY:

We used search engines of Google, Google scholar and Pubmed for searching literature. Key words and phrases used were PCOS, Insulin resistance, hyperinsulinemia, hyperandrogenemia, hirsutism, acne, infertility, obesity, polycystic ovarian syndrome, reproductive and cardiovascular abnormalities, cyclical problems, anovulation and use of insulin sensitizers.

Filter used was search period 2012-2018.Total 89 articles were selected for writing the review. Out of these 36 articles were non-relevant on account of the use of oral contraceptives, clomiphene citrate and insulin sensitizer other than metformin. Three articles were in non- English language while 6 studies were on rabbits and mice (non-human). Finally, 44 articles are included for write up of this review article.

LITERATURE REVIEW:

In 1935 Stein and Leventhal explained the term polycystic ovarian syndrome, also called as syndrome X or Stein-Leventhal syndrome. PCOS is characterized as the major cause of WHO classified type - 2 anovulatory infertility. Polycystic ovarian syndrome mostly present in women of reproductive age[26]. Features of polycystic ovarian syndrome are irregular period or amenorrhea, increased hair growth and infertility. Fifty to seventy percent of women with polycystic ovarian syndrome are affected by Insulin resistance that can lead to metabolic syndrome, hypertension, dyslipidemia, alteration in the level of glucose, and diabetes. There is also increased risk of deposition of calcium in coronary artery. Depression, anxiety and bipolar disorder are commonly found in PCOS. Environmental and genetic history origin both are considered as an etiological factor. Irregular menstruation is common feature of PCOS but 30% have normal menses, 30%–40% have amenorrhea and 85%–90% have oligomenorrhea[27].

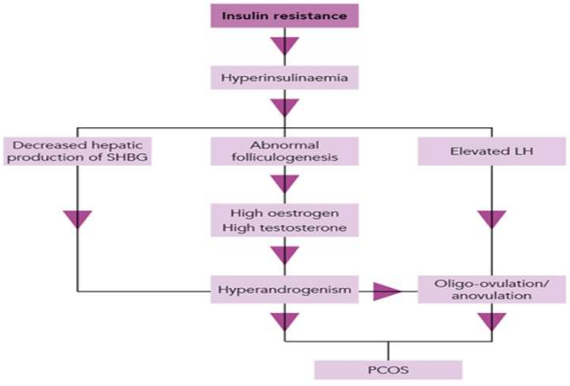
Genome wide association studies (GWAS) has documented that SNP (rs11031006) related to PCOS resides in the region of follicle-stimulating hormone (FSH)-b polypeptide (FSHB) and ARL14EP gene which is strongly associated with luteinizing hormone[28].

PATHOPHYSIOLOGY OF PCOS:

Insulin resistance plays a main role in the pathogenesis of PCOS. Decreased sensitivity of insulin is aggravated by weight gain, which in turn exacerbates the clinical, reproductive, and metabolic features of the condition. It can lead to hyperinsulinaemia and subsequent abnormal follicular development, which in turn causes elevation of estrogen and androgen levels. Sex hormone-binding globulin decreases due to hyperinsulinaemia and the systemic effects are exacerbated by a reduction in sex hormone binding globulin (SHBG) along with persistently elevated luteinizing hormone (LH) levels, which arrest ovulation. High levels of circulating free androgens are responsible for the clinical features associated with PCOS, and the absence of ovulation causes unopposed estrogen stimulation on the endometrium and associated hyperplasia with resultant infertility[29].

DIAGNOSIS OF PCOS:

Anovulatory infertility due to PCOS is diagnosed upon



Firure 1. Hormonal changes that influence the development of PCOS

presence of two out of three features (a) evidence of hyperandrogenemia clinically and/or biochemically (b) oligo-ovulatory or anovulatory cycles (c) presence of more than 12 follicles in each ovary measuring 29mm and/or increased ovarian volume (>10mL) on ultrasonography.[8] Diagnosis of PCOS in anovulatory women is confirmed by a hormonal profile including serum levels of testosterone (or androstenedione) and gonadotropins – increased level of luteinizing hormone and normal level of follicle stimulating hormone, adds weight to the diagnosis of disease. Additionally, Serum prolactin level and the estimation of estrogen status in patients with amenorrhoea is also required. Routine thyroid function tests are also considered in PCOS. The importance of screening for autoimmune thyroid disease is underlined by the association of primary hypothyroidism with an increased risk of hyper-prolactinaemia and primary ovarian insufficiency[30]. Estimation of anti-mullerian hormone, as a new diagnostic tool (made by antral follicles, which are increased during polycystic ovaries) in combination with luteinizing hormone levels has high sensitivity and specificity for the diagnosis of polycystic ovary syndrome[31].

MANAGEMENT OF PCOS:

Lifestyle modification (LSM) is considered to be the first step of management. It recommends that overweight patients with PCOS should control their diet that is to consume 1200–1500 kcal/day and ensure that they should engage in moderate exercise for at least 30 min per day for at least five days a week. By restricting caloric intake, engaging in exercise, reducing BMI addressing behavior, receiving metformin, giving up smoking and drinking, patients can improve insulin resistance and free testosterone levels as well as reduce menstrual disorders, excess hair growth, acne and above all restore fertility[32].

As mentioned earlier insulin sensitizers are the mainstay of treating PCOS related infertility as underlying pathology revolves around insulin resistance. Among the insulin sensitizers metformin is a well-tested or it may not be wrong if the term conventional insulin sensitizer is used for this drug as it is in use for PCOS since 1994. Metformin is a guanidine derivative that was obtained from the plant Galega officinalis (French lilac) at first time and has been used for more than 60 years to reduce hyperglycemia[33]. Metformin decrease the fasting levels of plasma insulin, C-peptide and proinsulin-like molecules. It also increases insulin binding, enhancing the utilization of glucose peripherally, and reduces the formation of glucose by the liver. Androgen production by theca cell also reduces significantly in vitro[34]. Metformin has a positive effect on ovulation and also stimulates it[35]. It reduces the risk of ovarian hyperstimulation syndrome for IVF (in vitro fertilization) during controlled ovarian stimulation before or during treatment with metformin is another advantageous option for the patients[36]. Metformin is a class B drug in the US food and drug administration's drug safety classification, although a meta-analysis have showed that early use of metformin by PCOS patients did not increased the risk of birth defects[37].

PHARMACOKINETICS OF METFORMIN:

Metformin is taken by oral route and excreted unchanged in the urine. Its half-life is almost equal to five hours. The drug is well distributed in all body tissues including the intestine, liver, and kidney by organic cation transporters. It is prescribed 1500- 2500 mg daily in two or three divided doses. Metformin is well tolerated but in some patients it may cause nausea, vomiting, diarrhea and bloating. This usually settles as the treatment continues. However, escalation dose therapy not only prevents these features but also improves patient`s compliance to treatment. Physician should inform the patients about the gastrointestinal side effects of the drug before starting the treatment that last for two to three weeks. Patients should be advised to take the drug with meals to avoid the side effects and dose should be gradually increased to improve the compliance[38].

PHARACODYNAMICS OF METFORMIN IN PCOS INDUCED INFERTILITY:

Metformin's primary action is to inhibit the production of hepatic glucose, decrease lipid synthesis, increase fatty acid oxidation and inhibit gluconeogenesis resulting in a decrease in circulating insulin and glucose[3]. It has been proved that metformin enhances the ability of insulin to induce GLUT4 translocation to the plasma membrane. Metformin activates AMP-kinase enzyme also[40]. In PCOS, metformin increases insulin release and inhibits androgenic excess via effects on steroidogenic acute regulatory protein and 17alpha-hydroxylase. Metformin improves insulin resistance and compensatory hyperinsulinemia associated with PCOS. It increases production of Sex hormone-binding globulin (SHBG) and reduces androgens in circulation. This in turn improves the function of theca and granulosa cells of the ovaries that increases fertility. Metformin also exerts pleiotropic effects on insulin sensitive tissue such as liver, skeletal muscles, adipose tissue, endothelium and ovaries. In addition, it also has a direct effect on the ovaries and improves cyclical disturbances and ovulation rates in most of the PCOS women. Moreover, Gonadotropin-releasing hormone (GnRH) neurons in hypothalamus regulate fertility through central mechanism which is dependent on 5' adenosine monophosphate-activated protein kinase (AMPK) pathway. Metformin inhibits 5' adenosine monophosphate-activated protein kinase (AMPK) pathway as well as neuropeptide -Y neurons in the hypothalamus and thereby improves fertility and produces suppression of appetite in PCOS[41].

ADVERSE EFFECTS AND CONTRAINDICATIONS OF METFORMIN:

Diarrhea, nausea and or abdominal discomfort are the most common side effects associated with metformin. These symptoms occur in 50% of patients after taking the drug.

They are mild and usually settle as the treatment is continued or at low doses. It produces side effects in five percent of the patients, even at low doses. When the drug accumulates in the enterocytes of the small intestine these types of side effects may be produce. Slow-release or extended release formulations are associated with less gastrointestinal upset[42]. A dangerous side effect of Metformin is lactic acidosis through interference with mitochondrial respiration because of this blood lactate levels rises as there is conversion of glucose to lactate. This is also caused by toxic range of drug level in blood (> 5.0 mg/l) [normal range, 0.5–2.0 mg/l][43]. Use of Metformin for prolong period of time interfere with the absorption of vitamin B12 level therefore it is recommended that level of vitamin B_{12} should be monitored in anemic patients or in patients with peripheral neuropathy. Therefore, oral formulation of vitamin B_{12} should be given to the patients on long term use. Before the use of Metformin, physician should inform the patient about the side effects of the drugs[44]. Use of Metformin should be avoided in many situations that increases the risk of lactic acidosis, such as severe dehydration, infection, shock, heart failure, recent myocardial infarction, severe peripheral vascular disease, hepatic impairment, alcohol dependency.

CONCLUSIONS:

Metformin has multiple beneficial effects in the treatment of PCOS. It helps in reduction of weight and restoration of menses with normal functions of the ovaries. It also improves hyperinsulinemia and hyperandrogenemia associated with PCOS induced infertility. Metformin increases the rate of ovulation and conception in women with PCOS and hence represents the apex of the triad with the base being formed by PCOS and infertility. In other words, the base of PCOS and infertility converge towards the apex of solution which is metformin.

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Review Article

Pharmacological Treatment Of Osteoarthritis In A Nutshell

Mehtab Munir, Khalid Mustafa Memon, M Sajid Abbas Jaffri

ABSTRACT:

Osteoarthritis, an inflammatory, degenerative disease of joints mostly affects weight bearing joints in old age. Treatment modalities are categorized into non-pharmacological, pharmacological and surgical. Among pharmacological options, oral formulations are mostly used. Acetaminophen is considered as first line though, NSAIDs are well established choice for the management of osteoarthritis and mostly employed for the same. However NSAIDs are associated with gastric adverse effects. Symptomatic slow acting osteoarthritis drugs like glucosamine, chondroitin sulfate, diacerein and avocado soybean saponifiables are considered as maintenance therapy as they have shown to reserve joint space width. Topical formulations are good for patients with co-morbidities. For patient not responding to other modalities, opioids and duloxetine are employed but with caution. Intra-articular injections like corticosteroids, hyaluronic acid and Platelet rich plasma are ranked highest in efficacy. Newer agents like Nerve growth factor-α inhibitors, Interleukin-1 antagonists and certain neutraceutical preparations are under investigation for osteoarthritis management.

Key words: osteoarthritis, treatment, pharmacological modalities, conservative

INTRODUCTION:

Osteoarthritis (OA) is an inflammatory and degenerative disease of joints in which mostly weight bearing and hand joints are affected[1]. In OA there is damage of articular cartilage that causes bones to rub against each other leading to pain and loss of movement[2]. It is the most common arthritis and one of the leading causes of disability in world[3]. Commonly affected age is above 50 years and gender is female[4]. According to WHO, worldwide 9.61% of males and 18.0% of females over 60 years of age have symptomatic osteoarthritis[5]. India showed the prevalence to be 5.8% and mostly people over 65 years of age were affected. Prevalence of OA in Northern areas of Pakistan was found to be 3.7% and there was predominance of knee joint involvement that is 95%[6]. Because of increasing life expectancy and obesity, prevalence of OA is expected to increase steeply worldwide in next few years[7].

OA is classified into primary OA, with unknown etiology and secondary OA, having a known etiology. Predictors of OA are: mechanical injury, age, gender, obesity, genetics, metabolic disorders etc. Pathology of osteoarthritis begins with loss of articular cartilage then spreading to subchondrial bone. The bone shows sclerotic changes, formation of osteophytes and synovitis. Loss of cartilage, synovitis along with some other causes, leads to pain[8].

Common complaints of OA patient are pain and stiffness after long period of movement (exercise)[9]. There can be tenderness, swelling, crepitus and decrease in range of movement on examination. X-ray shows decrease in joint space and osteophytes[10]. Joint space width (JSW), measured on x-ray is considered gold standard for detection of loss of articular cartilage[11]. OA can be graded on plain radiograph according to Kallgren Lawrence grading system[12]. Diagnosis is done using American College of Rheumatology criteria for knee,[13] hip[14] and hand joints[15].

Treatment of OA is non-pharmacological, pharmacological modalities and surgical intervention. (table 1) Long term monitoring course of the disease, follow up and review is also essential[16,17]. Non-pharmacological and pharmacological approaches are conservative management modalities. Pharmacological modalities are the mainstay and commonly employed for the management of osteoarthritis. However succinct information regarding this subject has been found to be lacking. This review is a meek effort to provide current

Type of treatment	Examples
Conservative A. Non-pharmacological	Exercise, weight loss, physical therapy, walking cane, shock absorbing foot wear, acupuncture etc
B. Pharmacological	a. Oral Acetaminophen, oral and topical NSAIDs, SYSOADs, opoids, duloxetine b. Topical NSAIDs, capsaicin etc c. Intra-articular injection Corticosteroids, hyaluronic acid etc
Surgical	Microfracture, arthroscopy, arthroplasty etc

Table 1. Treatment modalities for osteoarthritis

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Received: 14-09-18
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and approved pharmacological treatment of osteoarthritis.

METHODOLOGY:

Literature search was done using electronic data bases 'Google scholar' and 'Pubmed' from 2008-2018. Key words and phrases used were osteoarthritis, alone and with treatment, pharmacological treatment, acetaminophen, NSAIDs, diacerein, capsiacin, corticosteroids, hyaluronic acid, duloxetine, platelet rich plasma. Initially 150 articles were selected. Inclusion criteria were original and review articles. Exclusion criteria were animal studies, non-pharmacological and surgical interventions in OA. 60 articles meeting inclusion criteria were included to write this review.

LITERATURE REVIEW:

Pain is the main and early symptom of OA and other types of arthritis. The core ingredient for management of pain is the pharmacological treatment.[18] This includes primarily oral, topical and intra-articular formulations.

a. Oral

i) Acetaminophen

Acetaminophen is recommended as first line treatment of OA and is well tolerated. It is a non-prescription drug and suitable for OA of mild to moderate severity. Acetaminophen is a non-opioid with anti-pyretic and analgesic properties. Acetaminophen has not proven to be very effective for OA pain in many studies[19,20], but it has lesser gastric adverse effects as compared to NSAIDs. However patient should be counseled about maximum dose (that is 4g) that can be used per day and concomitant use of any other over-the- counter drugs containing Acetaminophen, as over dosage can cause hepatic toxicity[21]. Recently investigated extended release (ER) Acetaminophen has proven to provide more effective pain relief in OA[22].

ii) NSAIDs

Non steroidal anti-inflammatory drugs are well established treatment option for OA[23,24]. These are inhibitors of cyclo-oxygenase (COX) enzyme thus halting conversion of arachidonic acid to prostaglandins responsible for inflammation and pain. They are classified as non-selective (inhibiting both COX 1 and 2) and COX-2 selective NSAIDs[25]. Nonselective NSAIDs like Diclofenac, Ibuprofen, Naproxen are significantly associated with gastric adverse effect (because of COX-1 inhibition), hence a proton pump inhibitor is recommended with their use[26,27]. COX-2 selective inhibitors like Celeoxib, Etoricoxib etc have lesser gastrointestinal effects but more prone to cardiovascular events (myocardial infarction, stroke etc)[28]. Based on these facts systemic NSAIDs should be used cautiously especially in elderly OA with co-morbidities or where long term use is required.

iii) Symptomatic Slow acting Drugs for Osteoarthritis (SYSADOA)

SYSADOA include Glucosamine, Chondroitin sulfate, Diacerein and Avocado-Soybean Unsaponifiables (ASU).[29] Glucosamine and chondroitin sulfate are naturally occurring compounds in body and are substrates for proteoglycan.[30] Chondroitin sulfate and glucosamine are available in pharmaceutical grade and neutraceutical preparations; however there is striking difference among the two preparations. As pharmaceutical grade preparations are prepared under high quality checks they have shown to be more effective to improve pain and function in OA[31]. Chondroitin sulfate and glucosamine are recommended to be used as maintenance therapy alone or in combination. Moreover use of this combination for 2 years has shown to reduce joint space loss[32].

Diacerein is an anthraquinone derivative, and its active metabolite is rhein. The key mechanism of action of Diacerein is to inhibit the interleukin-1α (IL-1α) system and subsequent signaling. IL-1α has been found to be increased in synovial fluid of joint affected, hence its inhibition benefits in improving signs and symptoms of OA[33]. Diacerein can cause stomach upset (dose related), mild skin reactions and rarely hepato-biliary problems but these are much less than adverse effects of NSAIDs[34]. European Society for Clinical and Economic Aspects of Osteoarthritis (ESCEO) recommends Diacerein for patients of OA for whom NSAIDs are not suitable[35].

ASU are unsaponifiable fraction of avocado and soybean oils. Its anti-OA properties are attributed to many mechanisms like inhibition of interleukin-1 (IL-1), IL-6, IL-8 and TNF-α. It has also chondro-protective role by stimulating collagen synthesis[36]. Hence it has shown to inhibit deterioration in joint space width (JSW) and demonstrated efficacy in relieving symptoms of knee and hip OA. Moreover safety profile of ASU is good[37].

iv) Opioid analgesics and duloxetine

Opioid are potent analgesics that act through spinal and supra-spinal opioid (μ) receptors and provide physical as well as psychological part of pain. These should be prescribed with cautious and weak opioids should be prescribed first, as there is risk of sedation, respiratory depression, misuse, overdose and dependency. Moreover opioids are to be prescribed for short duration of time[38].

Duloxetine is an anti-depressant drug and is approved by FDA as analgesic for arthritis[39]. It is a potent serotonin and nor-epinephrine reuptake inhibitor (SNRI). These neurotransmitters also play role in central pain pathways. Hence role of Duloxetine is implicated in chronic pain conditions like OA[40]. Opioids and Duloxetine are treatment options for OA patients who are unresponsive to other pharmacological treatment options, unwilling to undergo surgery or if total arthroplasty is contraindicated, due to higher risk of serious adverse effects[1,41].

b. Topical

i) NSAIDs

Topical NSAIDs are used as alternate to oral formulation. They reduce systemic exposure to NSAIDs, hence beneficial for patients having OA with co-morbidities or elderly. Its mechanism has been discussed above, however considered as safer option than oral NSAIDs as there are no related serious adverse effects[42]. Topical application of ibuprofen, diclofenac, ketoprofen, peroxicam etc are available[43].

ii) Capsaicin

It is active ingredient of chilies. It provides warmth and desensitizes the nerve endings by inhibiting a pain neurotransmitter, Substance P. There is abundance of nociceptive innervations in joint cartilage and capsaicin is also known to cause selective and reversible destruction of primary afferent fibers. Burning sensation and local skin irritation are main adverse effects[44]. Its use in OA has been recommended by OARSI 2014 and ACR 2012[16,41].

c) **Intra-articular**

i) Corticosteroids

Intra-articular corticosteroid injections are proven to be quite effective but are reserved for patients not responding to other pharmacological options[41]. Steroids have anti-inflammatory and anti-nociceptive actions[45]. Crystalline triamcinolone and non-crystalline prednisolone, methylprednisolone are frequently used[46]. These injections are not recommended more than 3-4 times in a year. Patient's response for pain relief and functional improvement may vary with intra-articular steroids[47]. The effect last for 3 weeks to no more than 6 months[46].

ii) Hyaluronic acid (HA)

Intra-articular injection of hyaluronic acid and its derivatives is called viscosupplementation. This injection has been approved by FDA, only for knee OA. It is naturally present in synovial fluid, proposed underlying mechanism to reduce pain is restoration of viscoelastic properties of the synovial fluid and reductions in friction within the joint[48]. The evidence for efficacy of this treatment option is controversial. Local adverse reactions are main risk of the injection[49].

Combination of corticosteroid and hyaluronic acid intra-aricular injection has been shown more effective as compared to monotherapy[50].

iii) Platelet rich plasma (PRP)

PRP is an autologous blood product that is obtained when whole blood is centrifuged to obtain a specific concentration of platelets. The use of PRP is thought to provide cellular and humoral mediators (growth factors) including vascular endothelial growth factor, Fibroblast growth factor b, epidermal growth factor, ?broblast growth factor and platelet-derived growth factor for tissue healing especially cartilage repair[51]. PRP has shown to be superior or equally effective as HA in treating knee OA. Moreover PRP has not been found to produce serious local or systemic adverse effects[52].

Among all the conservative treatment options intra-articular injections are ranked highest in efficacy for management of OA by most of authors and researchers[53].

d) Others

Despite the fact here is a long list of drugs for management of OA, an increasing trend has been observed in patients for the use of alternate medicines for few decades[46,54]. This is because of long term use of the drugs for chronic and debilitating disease like osteoarthritis and troublesome adverse effects caused by them. The alternate medicines include herbs like Boswella serrata, curcuminoids, passion fruit peel extract, ginger, rosehip[55] and dietary supplements like methylsulfonylmethane[56], vitamin D and K. Although these herbal and neutraceutical products are being used for management of OA, evidence for their efficacy is weak. Hence more studies are warranted in this regard.

e) Drugs under investigation

Tanezumab is a monoclonal antibody against â-nerve growth factor **α**-(NGF-**α**). NGF is involved in causing chronic pain in OA, hence by inhibiting NGF-**α,** Tanezumab is effective for improving symptoms of OA this drug is still under trial but is facing safety issues[57].

IL-1 receptor antagonists: Anakinra and Orthokin have shown to decrease pain in OA. IL-1 had been shown to increase in synovial fluid of affected joint[58]. Moreover IL-1**α** antibody Gevokizumab is in phase 11 trials for efficacy and safety in treating hand OA[59].

Now focus of research in OA is on disease modifying agents rather than drugs providing only symptomatic relief. Strontium ranelate (SrRa), presently indicated for prevention of fracture in severe osteoporosis, has shown promising results in reducing cartilage volume loss in OA. It is an element similar to calcium, and is incorporated in bones in place of calcium. SrRa has been proved well tolerated and safe so far[60].

Intra-articular injection of DNA to modify chondrocytes to produce TNF- **α**1 and intra-articular injection adipose derived stem cell (ADSC) are also under investigation[36].

CONCLUSION:

When pain and function of joint does not respond to non-pharmacological management, pharmacological treatment should be considered. Different pharmacological treatment options are present for management of OA, but treatment should be chosen in stepwise manner, keeping in consideration, individualized needs and benefit-to-risk assessment.

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Case Report

Eagle's Syndrome Presenting As Unilateral Pain In The Anterolateral Neck And Referred Otalgia

Waseem Mehmood Nizamani, Ameet Jesrani, Mujtaba Khan, Kalthoum Tlili, Nader Al Khuraish, Kousar Magsi

ABSTRACT:

Eagles syndrome or stylohyoid syndrome is a rare condition where slender elongated temporal styloid process or ossified stylohyoid ligament manifest a wide range of symptoms including otalgia, dysphagia, foreign body sensation in throat, pain in retrogonia or along anterolateral neck. It occurs mostly unilaterally however bilateral cases are also reported. Multislice computed tomography with maximum intensity projections reconstructions is used for diagnosis and management purposes. It also aids to see its compressive effect on adjacent anatomical structures.

Key Words: Otalgia, Multislice Computed tomography, calcified stylohyoid ligament.

INTRODUCTION:

Styloid process is pointed bony projection in the tympanic part of temporal bone and it lies anterior to the stylomastoid foramen. In tonsillar fossa, it is deeply located between internal and external carotid arteries[1]. In adults normal length of styloid process varies from 2.0cms to 2.5cms[2]. Greater than 3.0 cms is referred as elongated styloid process[3,4]. Cylindrical elongated styloid process is implicated to in craniocaudal pain syndromes i.e, Eagle's syndrome[5,6]. Variation in length (Eagle's syndromes), Position of styloid process, postsurgical fibrosis of tonsils, infection or post trauma may cause symptoms. Eagle's syndrome is characterized by symptoms due to an elongated styloid process (greater than 3 cms) or a calcified stylohyoid ligament[7]. Clinical examination, craniocervical features, digital palpation of styloid process in tonsillar fossa. Radiological findings and lidocaine infiltration test confirms its diagnosis[8]. Surgical and conservative treatment can be done.

CASE REPORT:

An old male who presented with complain of left sided neck and ear pain which is increasing during swallowing, masticating and stretching head for two months. No history of head trauma or surgery was present. On clinical examination, a hard mass is seen in left submandibular mass and causing pain on inspection and palpation. No other oropharyngeal abnormality was seen. Unenhanced computed tomography confirmed the diagnosis of elongated styloid processes with their length reaching at the level of mandibular ramus and reaches the submandibular region (fig. 1 and 2). It approximately measures 4.5 cms. These are causing mild compression on carotid jugular complex. Patient was informed about his diagnosis and six months follow up was suggested.

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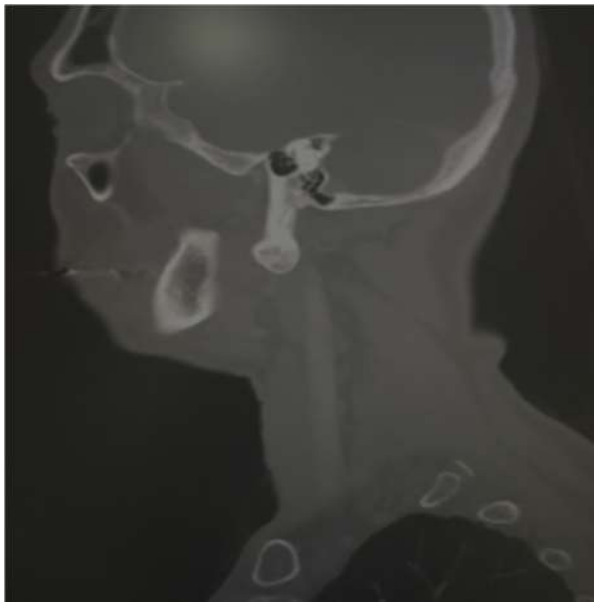
Received: 22-10-18
Accepted: 11-12-18

DISCUSSION:

Styloid process is an elongated pointed bony outgrowth from lower part of temporal bone which moves downwards and anteriorly towards maxilla vertebra pharyngeal recess, carotid vasculature, internal jugular vein and cranial nerves. Embrologically styloid process and ligaments are derivatives of Reichert's cartilage of second brachial arch. It is derived from temporal bone[9]. Its apex is important due to its location between external and internal carotid arteries and facial nerve which runs anteriorly and medially to it[2]. Ligaments can mineralize because of their cartilaginous origin. Mineralization of styloid ligament results into symptoms first attributed by Dr. Watt Eagle, an otolaryngologist in 1937[9]. Styloid process and temporal bone has implicated in craniocervical pain syndromes. Symptoms occur secondary to variation in length, position of styloid process, post-surgical fibrosis infection and trauma. Elongated styloid is considered if its length is greater than 3cms[10]. Its cause in still unknown. Its incidence is 4% to 28% and is most commonly seen in women[11]. It includes the symptoms of pharyngeal pain, foreign body sensation, otalgia, dysphagia and odynophagia. There are two sub types of Eagle's syndrome, the classic styloid and stylocarotid artery syndrome[1]. The classic type usually occur after tonsillectomy and result into pharyngeal pain radiating to middle ear and mastoid region, foreign body sensation, otalgia, dysphagia and odynophagia[12,7]. Impingement of carotid artery by

elongated styloid process and calcified stylohyoid ligament result into carotid artery syndrome. Internal carotid artery involvement occurs when styloid process is bent laterally and causes constant neck pain on turning the head, pain. Other related symptoms include globus sensation, tinnitus, headache and otalgia[13]. Ischemia in affected area of head and neck is also responsible for the pain[14]. Multiple imaging techniques (modalities) are useful in diagnosis of this syndrome. It mainly includes conventional lateral and anteroposterior (AP) radiographs of head and neck, Towne's view orthopantomograph and computed tomography. Best imaging modality is multi slice computed tomography and 3-Dimensional reconstruction to provide exact



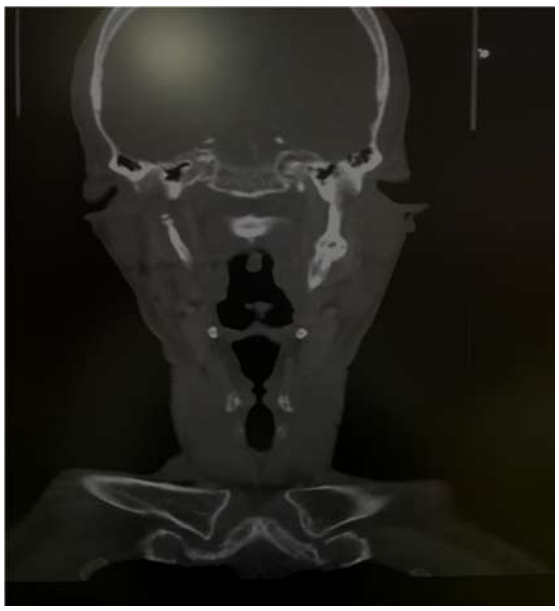
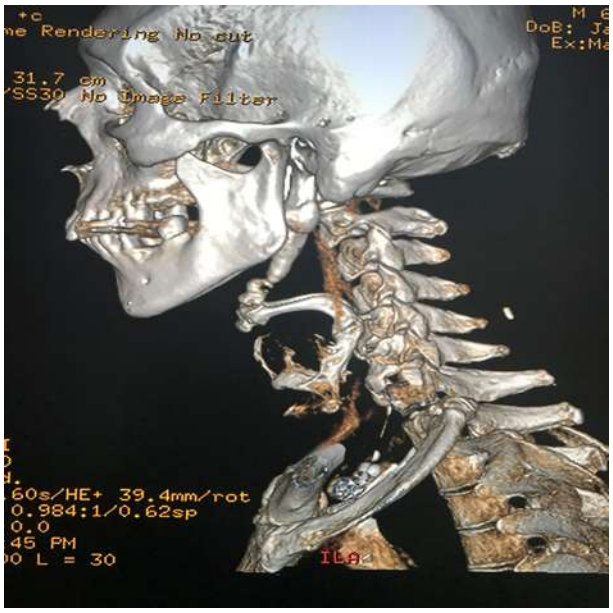


Fig.1, CT scan in bone window sagittal and coronal reformatted views demonstrating elongated styloid process causing mass effects over adjacent soft tissues.



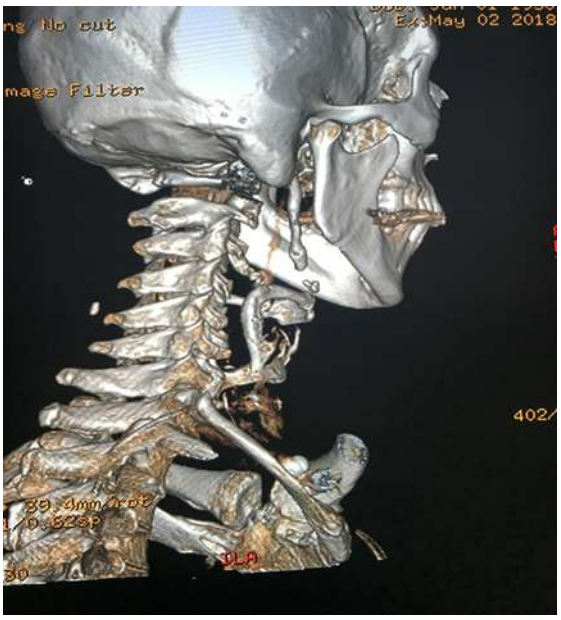


Fig.2, CT scan, Volume Rendered Surface Shaded Display, sagittal view showing elongated Styloid Process.

measurements of elongated styloid process and adjacent structure anatomy and normal variations, however, Orthopantomograph and x/ray plain radiographs can possibly misinterpret the diagnosis and are nonspecific[15,16]. Conservative and surgery are treatment options for symptomatic patients. Counseling and use of steroids, painkillers, local anesthesia and oral carbamazepine can be used in medical treatment. Chronic cases require surgical option for management[17].

CONCLUSION:

Eagle's syndrome should be kept in differentials in patient

presenting with orofacial or ear pain, tinnitus and globus sensation. Multislice computed tomography and 3-dimensional reconstructions is the best investigation for confirmation of its diagnosis. Conservative treatment is preferred with follow-up twice a year.

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Dietary Antioxidant An Indispensible Nutrient

Shizma Junejo, Zara Sami, Faiza Rafique Shaikh

Free radicals prevail as atoms, molecules or unpaired electrons being extremely reactive as well as unstable[1]. They can lead to chemical reactions alongside different molecules. Having been originated from constituents like oxygen, sulphur as well as nitrogen which contribute towards production of reactive oxygen species (ROS), reactive nitrogen species (RNS), reactive sulphur species (RSS)[1].They include superoxide anion(O_2-•), hydroperoxyl radical (HO_2•), hydroxyl radical (•OH), hydrogen peroxide (H_2O_2), singlet oxygen (1 O_2), hypochlorous acid (HOCl) and peroxynitrite (ONOO-) . Free radical species are formed in the course of plentiful oxidative metabolic processes in mitochondria [1].

There is extremely mild equilibrium between the making together with the counteraction of ROS through antioxidants. As a consequence whenever the equilibrium gravitates towards over production of ROS then as a sequel to oxidative stress cells begin deteriorating.

Being usual component of metabolism inside mitochondria, by way of xanthine oxidase, peroxisomes, inflammation processes, phagocytosis, arachidonate pathways, ischemia and physical exercise, free radicals production occurs inwardly[3]. Assisting with advanced making of free radicals are extraneous causes including smoking, environmental pollutants, drugs, pesticides, industrial solvents as well as ozone[2].

Free radicals exist as either atoms, molecules, ions inclusive of unpaired electrons which are extremely unstable plus in addition efficacious in relation to chemical reactions alongside other molecules[3]. Emanation of free radicals is from three elements including oxygen, nitrogen as well as sulfur, hence forming reactive oxygen species (ROS), reactive nitrogen species (RNS) as well as reactive sulfur species (RSS). ROS consist of free radicals such as superoxide anion (O_2-•), hydroperoxyl radical (HO_2•), hydroxyl radical (•OH), nitric oxide (NO) plus other species such as hydrogen peroxide (H_2O_2), singlet oxygen (1 O_2), hypochlorous acid (HOCl) and peroxynitrite (ONOO-) [3]. Free radicals, antioxidants as well as co-factors prevail as three predominant spheres which presumably may be partly responsible for aging process retardment [1].

DNA is also affected with free radicals attack. Changes are both chemical and structural. They are deletions, frame shifts, strand breaks, chromosomal arrangements, amendments of all bases, formation of base-free sites[4].

Peroxidation of lipid is begun through advancement toward side chain of fatty acid via a free radical directed towards separating a hydrogen atom from a methylene carbon[5]. Higher number of double bonds, makes it additionally simple to remove hydrogen atoms to form a radical and produce monounsaturated fatty acids and saturated fatty acids. The reaction continues with the formation of peroxyl radical that dislodges further hydrogen atoms and completes the process of lipid peroxidation [5].

There are two chief classes of antioxidants. These include enzymatic antioxidants as well as non-enzymatic antioxidants. In addition the enzymatic antioxidants exist as grouped into primary as well as secondary enzymatic defenses[5].Three important enzymes constitute primary defence and their function is controlling formation of free radicals. These include glutathione peroxidase, which provides two electrons reducing peroxides through formation of selenols, catalase which turns hydrogen peroxide to water plus molecular oxygen. Also superoxide dismutase, which changes superoxide anions towards hydrogen peroxide[1]. As part of secondary enzymatic defense, the enzymes are glutathione reductase as well as glucose-6-phosphate dehydrogenase [6]. Glutathione reductase reduces glutathione an antioxidant against oxidized state of it, towards reduced form of it[6]. Glucose-6-phosphate reconstructs NADPH, leading to reducing environment[6]. The group of non-enzymatic antioxidants includes vitamins such as A, E, C, enzyme cofactors (Q10), minerals like zinc and selenium, peptides like glutathione, phenolic acids as well as nitrogen compounds like uric acid [5].

The antioxidants are playing major role in human health and immune system, as they are maintaining function and structure of cell by means of destruction of free radicals[7].Carotenoids and tocopherol in combination giving more potent antioxidant effect on biological membranes the lipid bilayers[7].Carotenoids detoxify nitrous oxide, sulfonyl, thiyl, peroxyl and single oxygen and save the lipid peroxidation from hydroxyl and superoxide free radicals[7].Optimum nutrient content allows efficacious absorption as well as metabolism of antioxidants in food[7]. Reactive oxygen species are formed by partial reduction of molecular oxygen as a result of aerobic metabolism through

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Received: 20-11-18
Accepted: 12-12-18

the reaction with drugs and environmental toxins [8]. They produce dangerous chemical outcomes effecting DNA, lipids, proteins and lead to death of cell. Oxidative stress is a condition which is produced due to excess of free radicals and conversely as a result of diminished antioxidant[8]. Membrane lipid peroxidation causes membrane fragility leading to anemia which is hemolytic[9]. Effect of reactive oxygen species on lipids, proteins, carbohydrates plus DNA culminates in numerous diseases, rheumatoid arthritis, reperfusion injury, atherosclerosis and lung diseases[10].

Tissue defense mechanism against free-radical damage generally includes vitamin C, vitamin E and â-carotene and other carotenoids as the major vitamin antioxidant sources[5]. In addition, several metalloenzymes which include glutathione peroxidase (Se), catalase (Fe) and superoxide dismutase (Cu, Zn, and Mn) are also critical in protecting the internal cellular constituents from oxidative damage[5].

It is extensively established that a plant-based diet incorporating increased indulgence in consuming fruits, vegetables as well as several loaded with nutrient plant-based foods can lower the risk of diseases related to oxidative stress.[11] Natural antioxidant molecules have been suggested as a flipside mode of assistance for the prevention of age-related neurological diseases[12]. Various types of antioxidant molecules such as polyphenols and carotenoids as well as long-established antioxidant vitamins, vitamin C and E can enrich with this prevention[12]. According to epidemiological studies significant differences exist in the prevalence of various diseases among communal groups which have distinctive food practices. As an instance, epidemiological evidence has revealed that the Mediterranean diet, that has ample antioxidants, has an efficacious role in the prevention of age-related diseases like Alzheimer's. Green tea polyphenols are considered as strong antioxidants countering hydroxyl radicals, nitric oxide and lipid oxidation[12].

The dietary antioxidants like ascorbates, tocopherols as well as carotenoids are acknowledged. Furthermore, superfluous reporting exists concerning role of these in health. Vitamin C, vitamin E, along with betacarotene plus additional carotenoids as well as oxycarotenoids, including lycopene, lutein are amongst maximally extensively investigated antioxidants from diet.[13] Vitamin C has been studied as an exceptionally significant water-soluble antioxidant within extracellular fluids[13]. It has a role in counteracting reactive oxygen species within aqueous state prior to peroxidation of lipid. An essential soluble in lipid antioxidant is vitamin E. It is extremely potent chain-breaking antioxidant being associated with cell membrane, shielding fatty acids in membrane against lipid peroxidation[13]. Tissues upscale in lipid derive antioxidant protection through beta carotene a well as additional carotenoids[13].

Consumption of 250g of strawberries by healthy participants was correlated to reasonable yet important antioxidant activity elevation within serum as revealed by an evaluation, exhibiting possibility of boosting defense of body as counter to long-standing disease[14]. Antioxidants can prevail as synthetic or natural. Various sources of natural antioxidants include legumes, nuts, oilseeds, cereals, fruits, vegetables, animal products[15]. Adverse free radicals, having involvement in highly frequent cancers as well as distinct degenerative diseases inclusive of inadequate brain activity are scavenged by antioxidants[15].

Chief sources of naturally occurring antioxidants include fruits, vegetables, whole grains, green and black tea, coffee[15]. Antioxidants from oilseeds are represented by flaxseed, sunflowers, soybean, cottonseed and canola antioxidants. Fruits include various vitamins and mineral salts as well as dietary fiber[15]. Nearly all fruits constitute a sufficient way of providing vitamin C, carotenoids as well as polyphenolic compounds[15]. As proclaimed, extremely powerful antioxidant activity is linked to apples, restricting cancer cell propagation, lowering lipid oxidation, in addition decreasing cholesterol. As researched potato provides an adequate supply of antioxidants such as ascorbic acid, á-tocopherol and polyphenolic compounds[15].

Vegetables as well as fruits constitute the predominant source of flavonoids[15]. It has been revealed that pumpkin seed extract has anticancer, antimutagenic as well as antioxidant activities[15]. According to sufficient research black pepper as in piper nigrum seeds exhibit antioxidant plus radical scavenging activities. The finest sources of antioxidants from amongst vegetables are tomatoes, red pepper, brassica vegetables, onion, garlic and red beet[15].

Antioxidants can be treated as healthy compounds as advocated. It has been revealed by surveys that natural antioxidants exhibit exceptional role in humans, in addition they are free from harm[15]. Hence, we should use them in our diet. Accordingly use of these compounds as well as products assuredly influences our own health, as a consequence they must be utilized by us in our food.

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Sleep Paralysis: An Overlooked Phenomenon

Ambreen Kalam, Fazal Ameen Habib

Dear Sir,

'There is a time for many words, and there is also a time for sleep' Homer, the Odyssey. A recent systemic review of an aggregated data from 35 empirical studies (N=36,533 subjects) found that 7.6% of the general population experienced at least one Sleep paralysis episode over the course of their life. Higher lifetime prevalence rates were found in students (28.3%) and psychiatric patients (31.9%)[1].

Sleep paralysis is a commonly attributed state characterized by the inability to move either at the onset of sleep or upon awakening accompanied by hypnagogic experiences which are visual, auditory and sensory hallucinations[2]. It can occur as an isolated, familial or tetrad of narcolepsy. If it occurs while you are falling asleep, it is called hypnagogic or predormital sleep paralysis. If it happens as you are waking up, its called hypnopompic or postdormital sleep paralysis. Sleep paralysis has been estimated to effect approximately 1.7% to 40% of general population with victims predominantly students[3]. It typically peaks at the thirties and appears to be associated with post-traumatic stress disorder (PTSD), narcolepsy and panic attacks. Other major contributing factors include sleep deprivation, fatigue and stress. Alarming symptoms of Sleep Paralysis include feeling paralyzed, hear deafening buzzing sounds, feel electrical sensations shooting throughout the body. Difficulty in breathing due to an oppressive weight on the chest and body and a sense of suffocation (Adler). Person may hear footsteps or see indistinct shapes approaching them.

This condition is representing an upward trend for those who have frenetic and tedious jobs, because of hectic working hours, such individuals tend to get disturbed sleep and usually depend on caffeinated drinks to stay awake which all contribute in the long run to this condition. These symptoms need urgent treatment if they are disturbing the daily activities of a before normal healthy person. To start with, lifestyle modification tops the list which includes:

- Improving sleep hygiene and minimizing sleep deprivation
- Avoiding drugs and alcohol
- Sleeping on the side instead of the back
- Avoiding stimulants like caffeine and large meals before bed
- Minimizing exposure to blue light before bed
- Treating any mental health problems such as bipolar disorder or narcolepsy or leg cramps.
- Using antidepressant medications if prescribed by physician[5]

Hence it is imperative to note that sleep paralysis is a sleeping disorder which is drastically gaining momentum due to increase in stressful jobs and towering amount of competition which is very frequent in every field. To avoid this, a positive and healthy working environment must be enforced, along with sufficient time for family life. *"A well-spent day brings happy sleep",* Leonardo da Vinc.

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Received: 25-10-18
Accepted: 14-11-18

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b) Organization as author

The Cardiac Society of Australia and New Zealand. Clinical exercise stress testing. Safety and performance guidelines. Med J Aust 1996; 164: 282-4

c) No author given

Cancer in South Africa [editorial]. S Afr Med J 1994;84:15

d) Chapter in a book

Phillips SJ, Whisnant JP. Hypertension and stroke. In: Laragh JH, Brenner BM, editors. Hypertension: pathophysiology, diagnosis, and management. 2nd ed. New York: Raven Press; 1995. p. 465-78

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JBUMDC
Journal of Bahria University Medical & Dental College
Peer Reviewed Multidisciplinary Quarterly Published Journal
ISSN (print): 2220-7562, ISSN (online): 2617-9482
Recognized by PM&DC (IP/0072)
Online edition is available at URL: https://jbumdc.bahria.edu.pk,
Indexed with Index Medicus for the Eastern Mediterranean Region (IMEMR),
ROAD Directory of Open Access Scholarly Resources at https://portal.issn.org/
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