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REVIEWER'S LIST

The editor of JBUMDC extends gratitude to the following scholars for reviewing the manuscripts for current issue, Volume-8 No 2 of JBUMDC

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Vesicovaginal Fistula: Psychosocial Problems In Rural Areas of Pakistan

Nadia Khalid, Farhan Muhammad Qureshi

Vesicovaginal fistulas (VVF) are the most commonly acquired genital fistulas that are associated with numerous physical, social, psychological and sexual problems in affected individuals. The prevalence of VVF in women is found to be 2 million approximately in Sub-Saharan Africa and South Asia with an increasing number of 50 – 100 thousands cases every year[1].

VVF, also known as the obstetric fistulas, is a serious complication of child birth caused by obstructed or prolonged labour. It is an abnormal communication between the bladder and vagina resulting in the continuous leakage of urine from the vagina. [2] In developing countries, VVF commonly affects young pregnant women with prolonged obstructed labour, without on time medical or surgical intervention. Conversely, it is very uncommon in western or developed parts of the world after the mid of last century but still poses a major problem in developing countries especially in African and Asian countries[3].

Women affected by the VVF have the physical discomfort that increases the anxiety, worry and stress. Apart from the physical discomfort it also causes dermatological infections leading to fever and constant pain[4]. These problems not only increases the suffering but also affects the everyday life of the affected individuals. Due to continuous uncontrolled urinary incontinence in the patients of VVF, their social stigma damaged and therefore leading to psychosocial trauma that lowers their self-esteem and continuous stress[5] results in the detoriation of their mental health. Women with VVF are the vulnerable and the most impoverished members of the society, as they are unable to work and ostracized by society. They neglected by their families and family members do not like to spend time with them, even do not like to eat food cooked by them due to lack of cleanliness and offensive odours[6]. The relationship of VVF affected women with their husbands is also the major concern due to sexual and relationship problems. They are often abandoned by their husbands.

VVF patients also have problems to perform religion based activities. They are not able to perform prayers and have fast for religious purpose. The reason that hinders to perform religious activities is the continuous dribbling of urine. It is not limited to the affected individuals but also people residing with them because dribbling of urine make home and prayer places impure and inappropriate to offer prayers[7]. In addition, medical and surgical treatment of VVF is also a major issue especially in the lower and middle class families and bring financial burden on family. Thus, the women affected with VVF faced many challenges at a time that further deteriorate their overall health.

A community hospital in a rural area is serving to fight with this situation helping out females with this disease across the country, run by renowned team of doctors. Recently we have visited this hospital along with students as a part of their academic field visit in community health sciences, there we interviewed various patients who have done with repair of VVF and those waiting for surgery. Most patients were suffering from this condition more than 3 years and the main reason was the obstructed labour[8] and two cases were as a result of hysterectomy and caesarian sections. The interviews reveled most of the patients experienced at an early age and belonged to rural areas from Pakistan[9]. The common issues that those women faced are such as physical discomforts, social problems due to bad odor of urine that made them isolated from the society and mostly these females are unable to conceive that make their married life insecure mostly ending in separation or divorce, sexual and interpersonal relationship issues, psychological disturbances due to social instability as a result women feels rejected, gave up hopes and tortured, religious concerns, and financial issues. This center is providing services free of cost and rehabilitative activities are also a part of their treatment because sometime they have to go through more than three operations and need to stay for six months.

Lack of availability to skilled birth attendants and accessibility to emergency obstetric care especially in developing countries are the major reasons of acquired obstetric fistulas. Thus, the facilities must be provided with proper antenatal care as well as labor process must be conducted by trained midwives in rural area. The prevention and control strategies of VVF include education of females, safe motherhood initiative, and better family planning services, on government level legislation should be made against early marriages and women empowerment to make them a productive part of society[10]. Policies and laws made for legal age of marriage, health promotion by health awareness programs, provision of better family planning services will help in lowering in lowering the incidence of VVF. Efforts should be made to provide best and affordable healthcare services especially maternity care services with availability and accessibility.

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Rehabilitative activities need to be introduced to empower women, socially as well as economically to make them acceptable by society and a productive part of community.

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Original Article

Clinical Efficacy Of Ceftriaxone Versus Ciprofloxacin In Paediatric Enteric Fever

Anila Farhat, Asma Shaukat, Tariq Mahmood Khan

ABSTRACT:

Objective: Determination of the clinical effectiveness of ciprofloxacin versus ceftriaxone in children with enteric fever on the basis of defervescence within 72 hours of commencement of treatment.

Duration and Place of Study: This randomized controlled trial was carried out from 15th May to 15th November 2017 in pediatrics units of Benazir Bhutto Shaheed Teaching Hospital Abbottabad and Jinnah International Hospital Abbottabad.

Methodology: 90 children with uncomplicated enteric fever were admitted and divided randomly into two groups, Group A was administered I/V Ceftriaxone 75mg/kg OD and Group B was given I/V Ciprofloxacin 10mg/kg BD for seven days. Response to drug was taken as defervescence within 72 hours while continued fever after 72 hours was taken as no response. The data was analyzed by using SPSS Version 21.00.

Results: In our research study 53(58.9%) children were male and 37(41.1%) patients were female. The mean age was 8.43±3.17 years encompassing 4 to 14 years, mean weight of the patients in kg was 29.54±10.8 kg. Efficacy of ceftriaxone group was 93.3% while in ciprofloxacin group 62.2% patients became afebrile in 72 hours. The proportion of achieving defervescence within 72 hours was higher with ceftriaxone than with ciprofloxacin

Conclusion: Ceftriaxone is more efficacious in terms of achieving defervescence than ciprofloxacin in children having enteric fever.

Keywords: Clinical Efficacy, Ceftriaxone, Ciprofloxacin, Enteric Fever in Children, Defervescence

INTRODUCTION

Enteric fever is an infectious disease caused by *Salmonella enterica* Typhi and *Salmonella enterica* Paratyphi A, B and C. There may be milder to serious manifestations of disease which usually starts six to thirty days after introduction of causative agent. It is a common cause of morbidity in developing countries where a higher burden of disease is borne by children. The incidence rate varies from 180-494/100,000 among 5-15 year-olds and 140-573/100,000 among 2-4 years olds.

There are different forms in which a patient can present. One form is confirmed enteric fever in which patient has a body temperature =38°C (100.6 °F) for at least three days with a positive culture of *S. typhi.* Second form is presumable typhoid fever in which temperature is =38°C for at least three days, with a positive serodetection without *S. typhi* isolation. Other persons are protracted carriers who pass *S. typhi* in faeces or urine for longer than a year after an episode of acute typhoid fever[1]. Humans are the only natural host and reservoir of this bacteria. Food and water soiled with infected person's excreta serves as contagion of disease. The greatest proportion of people get the disease due to supply of sewage contaminated water. Ice creams have been identified as one of significant risk in the development of disease[2].

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The patient usually presents with fever, a coated tongue, diarrhea, vomiting, headache, constipation and abdominal pain[3,4]. In the endemic areas diagnosis is often made clinically due to non-availability of laboratory facilities for blood culture definitive for specific diagnosis of typhoid fever[4,5]. Complications in children can involve multiple organs like in adults. These include gastrointestinal complications (bleeding and perforation, hepatitis, cholecystitis and abscesses of liver and spleen), central nervous system complications which include seizures, encephalopathy and brain abscess while bronchopneumonia can ensue as a respiratory tract complication[6].

Both injectable and oral vaccines for prevention of enteric fever are available[3]. First line drugs include chloramphenicol, ampicillin and co-trimoxazole while second line drugs include quinolones like ciprofloxacin for the management of typhoid fever[1]. With emergence of drug resistant strains of *Salmonella* spp. in various countries including Pakistan, the response to these drugs is seen to be reduced and now the empiric treatment relies on third generation cephalosporins like ceftriaxone[2,4,5,7]. However their employment is restrained for cases who show resistance to traditional drugs as well as flouroquinolones. Resistance to flouroquinolones was

not reported till late nineties, however since last decade flouroquinolones resistant cases of enteric fever have been observed[8].

So keeping in view emerging drug resistance in population the current study is aimed at comparing the clinical effectiveness of ciprofloxacin and ceftriaxone with regard to patient's response to therapy with either.

METHODOLOGY:

This randomized controlled trial research was performed for a duration of six months that is from 15th May to 15th November 2017 in Pediatric ward of Benazir Bhutto Shaheed Teaching Hospital and Jinnah International Hospital Abbottabad. Consecutive sampling technique was applied for this study. Ninety children of either sex, aged between 4-14 years having enteric fever diagnosed on the basis of clinical presentation and positive typhidot test (IgM antibodies) were admitted and enrolled in the study. While exclusion criteria included known hypersensitivity to quinolones or lactam antibiotics, presence of complications, history of use of oral or intravenous antibiotics in last seven days as well as absence of fever at the time of enrollment. Informed consent was obtained from the parents of the children verbally as well as by documentation. Information about clinical presentation, laboratory typhidot test and treatment was recorded on detailed proformas. The Hospital Ethical committee gave prior approval for the study.

Two groups of forty five children in each were randomly formed in equal ratio based on random numbers. Group A patients were given injectable ceftriaxone 75mg/kg IV OD for 7 days[9] while patients of group B received ciprofloxacin 10mg/kg IV/BD for 7 days[10]. During the hospital stay typhidot test was done in the hospital laboratory under supervision of pathologist. Both groups were regularly observed for response to therapy. Response was described in our study as achievement of defervescence within 72 hours and no response was labeled when there was no abatement of fever in 72 hours.

STATISTICAL ANALYSES

Analysis of data was done using SPSS version 21.00. For age mean and standard deviation were determined while gender frequency and defevescence in 72 hours were determined using percentages. Chi square test was used to determine efficacy of two groups.

RESULTS

A total of 90 patients with 45 patients in each group were included in the study. In our research study, mean age of the patients was 8.43±3.17 ranging from 4 to 14 years, mean weight of the patients was 29.54±10.8 ranging from 10 to 54 kg as shown in figure 1. Out of the total 90 patients 53(58.9%) were male children while thirty seven, that is 41.1% were females. Frequencies of patients stratified in three age groups: 12 (13.3%) children were below 5 years of age, 52(57.8%) patients were between 5-10 years while 26(28.9%) patients were above 10 years. It was found that only 25.6% (23 out of 90) of patients were using boiled water in routine while remaining 74.4% (67 out of 90) of patients were having tap or well water as shown in table 1.

Clinical presentation of children with enteric fever is shown in table 2. Most of the patients presented with fever. Eight patients had fever < 100ºF, sixty children had fever between 100 to 103ºF while twenty two patients had high grade fever of >103ºF. Only twenty six patients were irritable while rest had clear sensorium. In 86 patients, that is 95.6% liver was not palpable while 4(4.4%) patients were found to have palpable liver <2.5cm. 31 patients presented with diarrhea while nausea and vomiting along with fever was presenting complaint in thirty and forty patients respectively. Patients found with diffuse abdominal pain were 52(57.8%) while 1(1.1%) child had pain localized in right hypochondrium as shown in table 2.

Out of total 53 male patients 23(25.6%) received ciprofloxacin and 30(33.3%) received ceftriaxone while out of total 37 female patients 22(24.4%) received ciprofloxacin and 15(16.7%) were given ceftriaxone as shown in table 3.

The number of patients in both groups that is Group A (Ceftriaxone I/V) and Group B (Ciprofloxacin I/V) achieving defervescence within 72 hours were observed and their percentages were calculated. It was found that in ceftriaxone group A 42(93.3%) patients achieved the response while three patients remained febrile even after 72 hours of treatment. In the ciprofloxacin (Group B) 28(62.2%) patients showed positive response while 17(18.9%) children gave no response in 72 hours as shown in table 3.

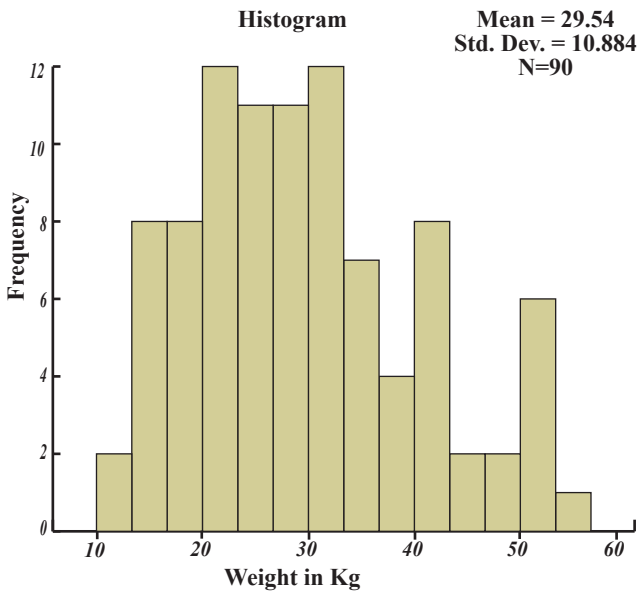

Figure 1: Histogram of weight in kg (n=90)

Variables	No of Patients (n= 90)	Percentage (%)
GENDER:		
Male	53	58.9
Female	37	41.1
AGE:		
< 5 years	12	13.3
5 to 10 years	52	57.8
Above 10 years	26	28.9
Use of Boiled water		
Yes	23	25.6
No	67	74.4

Table 1: Frequency of gender, age based distribution and use of boiled water:

Fever	**<100.6ºF** 8(7.2%)	**100.6 to 103 ºF** 60(54.0%)	**>103 ºF** 22 (19.8%)
Mental status	Clear 64(71.1%)	Irritable 26(28.9%)	Coma/Delirium 0(0%)
Liver Size	Not palpable 86(95.6%)	<2.5 cm 4(4.4%)	> 2.5cm 0(0%)
Loose motion	None 59(65.6%)	Mild 30(33.3%)	Severe 1(1.1%)
Vomiting	None 19(21.1%)	Nausea 30(33.3%)	Vomiting 41(45.6%)
Abdominal pain	None 37(41.1%)	Diffuse 52(57.8%)	RHC 1(1.1%)
Result of Abdominal exam	None 83(92.2%)	Distention 7(7.8%)	Ileus/peritonitis 0(0%)

Table 2: Clinical Presentation of enteric fever in children:

Response	Ceftriaxone A. N=45	Ciprofloxacin B. N=45	Total N=90
Male Patients	30 (33.3%)	23 (25.6%)	53 (58.9%)
Female Patients	15(16.7%)	22 (24.4%)	37 (41.1%)
Defervescence within 72 hours:	42 (93.3%)	28 (62.2%)	70 (77.8%)
Febrile after 72 hours:	3 (6%)	17 (37.7%)	20 (22.2%)

Table 3: Frequency of children showing defervescence within 72 hours:

DISCUSSION:

Enteric fever is one of the most prevalent virulent diseases representing 4th most common cause of mortality in Pakistan with the greatest occurrence in children between 5-19 years of age[11] which according to WHO criteria is considered to be high[12]. So disease poses a significant public health issue. With the emergence of resistance of S.typhi to multiple drugs treatment of enteric fever has become more difficult and complications are more likely to emerge especially in children. So due to resistance to traditional drugs like

		df	Asym. Sig. (2 sided)	Exact Sig. (2 sided)	Exact Sig. (1-sided)
Pearson Chi-Square	18.021 (b)	1	.000		
Continuity Correction (a)	16.751	1	.000		
Likelihood Radio Fisher's Exact Test	22.115	1	.000	.000	.000
N of Valid Cases	90				

Table 4: Chi Square Test for Comparison

chloramphenicol, ampicillin etc, Ciprofloxacin has been promoted as preferred agent for typhoid fever in children in our setups. However studies have shown that resistance to Ciprofloxacin is emerging[8,13]. It has been reported that ceftriaxone may be more effective in regions where enteric fever is endemic with high levels of resistance[13-14].

So our research was aimed to determine the effectiveness with regard to achieving defervescence in 72 hours of intravenous ceftriaxone 75mg/kg OD against Ciprofloxacin 10mg/kg BD in children with enteric fever. A total of 90 patients randomized in two groups of 45 patients in each (Group A: Ceftriaxone and Group B: Ciprofloxacin) were included. In our research study, mean age of the patients was 8.43±3.17 ranging from 4 to 14 years, mean weight of the patients was 29.54±10.8 ranging from 10 to 54 kg. Out of 90 patients 12 patients (13.3%) were below 5 years of age with maximum number of children (52, i.e. 57%) in 5-10 years of age. This is in accordance with the studies wherein overall disease occurrence was lowest in < 5 years and highest prevalence was seen in 5-9 years age group while 26 children (28.9%) were above 10 years of age[15,16]. Male patients were found to be 53(58.9%) and females were 37(41.1%)in this study. Our findings are also similar to a study conducted in Holy Family Hospital Rawalpindi which included 88 patients 41(46.6%) children were male, the mean age and weight being 8.3 ± 1.94 years and 24.7 ± 6.3 kg respectively[10].

In our research study fever was present in all patients with 82 patients having temperature more than 100 F. Other common associated complaints were diffuse abdominal pain in 57.8% of patients and vomiting in 45.6% of children. In a study conducted in Faridpur, Bangladesh fever was the presenting symptom in all the patients followed by vomiting and diarrhea in 18% of children. Abdominal pain was present in only 10% of patients.[17] Likewise in another study pyrexia was present in all individuals followed by emesis and abdominal pain in 31% patients, findings are somewhat similar to our study[18].

Out of total 90 patients 70 patients that is 77.8% became afebrile in 72 hours while 20 patients (22.2%) remained febrile even after the said time period. In ceftriaxone group A 42 out of 45 patients (93.3%) achieved defervescence in 72 hours and only three patients (6%) showed no response. While in group B that is Ciprofloxacin group 28 out of 45 children (62.2%) became afebrile and 17 children (37.7%) remained febrile even after 72 hours. So in the present study Ceftriaxone achieved defervescence in greater number of patients and showed low failure rate than those treated with Ciprofloxacin. Our findings are therefore similar to a study conducted in Rawalpindi in which among ciprofloxacin treated children, 25 (56.8%) showed defervescence and in 19 patients (43.1%) fever did not subside in 96 hours while 43 (97.7%) patients treated with ceftriaxone had their fever subsided in 96 hours and 1 (2.3%) patient did not respond. So it was demonstrated in the above study that the percentage of children achieving defervescence within 96 hours was greater in the ceftriaxone treated children as compared to the those who were administered ciprofloxacin[10]. Another study by Butt T *et al* reported similar results[19].

Our results differ from another study conducted in Thailand in which the oral Ciprofloxacin and injectable Ceftriaxone were compared to determine the time both the drugs take to lower fever to normal body temperatue in patients suffering from enteric fever. It was concluded in the study that there was no significant difference between the two methods of treatment that were employed ($p<.05$)[20]. In a meta-analyses and one another study findings it was concluded that there was no significant difference between efficacy of fluoroquinolones and cephalosporins in children with enteric fever[21,22]. In other studies ciprofloxacin and other fluoroquinolones was found to be superior to ceftriaxone in terms of fever clearance time and less clinical failures[23-25].

CONCLUSION:

Ceftriaxone is more efficacious in terms of achieving defervescence as compared to ciprofloxacin in pediatric patients with enteric fever. This study therefore adds to the data of management of children of KPK particularly of Abbottabad suffering from typhid fever where such study

has not been conducted previously. These findings may allow paediatricians in selecting appropriate medication for enteric fever in similar settings thereby avoiding the inconvenience of prolong treatment.

LIMITATIONS

There are however shortcomings of this study. Fever clearance time may not be adequate measure of efficacy since fever takes its own course, fever producing cytokines may continue to be produced even after clearance of S typhi so some people may not achieve defervescence in the required time frame. Also this study was conducted on a smaller population which may not reflect the larger population. So large, well designed rigorous trials should be conducted to establish the efficacy of ceftriaxone in enteric fever in chidren with more confidence.

CONFLICT OF INTEREST

There is no conflict of interest of authors.

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Original Article

Quantitative Assessment Of The Variations In Thyroid Dimensions In Relation To Increase In Serum TSH In Euthyroids

Mahrukh Kamran, Sahar Mubeen, Iffat Raza, Sanobar Bughio, Hira Waseem, Zainab Khalique Ansari

ABSTRACT:

Background: Volumetric evaluation of thyroid gland volume (TGV) is one of the criteria determining the iodine status of a population. TGV is the product of 3 dimension of each lobe: Anterio-posterior (AP) x medio-lateral (ML) x and cranio-caudal (CC) x correction factor.

Objectives: To determine the effect of serum TSH on thyroid dimensions of each lobe and to measure the amount of effect of per unit increase in serum TSH on thyroid dimensions of each lobe in euthyroids.

Study Design: It was a cross-sectional study.

Setting: The study was conducted at Ziauddin University Hospital, Clifton, Karachi.

Methodology: Healthy participants aged 21 years and above were included through convenient sampling. Serum Thyroid stimulating hormone was evaluated and ultrasound of thyroid gland TG of 192 euthyroid participants was performed. Spearman correlation and regression analysis was applied to evaluate the relationship between TSH and TG dimensions

Results: Relationship of increase in serum TSH with decrease in light lobe AP dimension was most significant. (r= -0.142 P-Value=0.001) and CC dimension least significant (r= -0.0098 P-Value=0.001). Where as in the left lobe AP dimension decreases significantly with increase serum TSH (r= -0.147 P-value=0.001). 11.7% of total variation in AP dimension, 3.5% of total variation in ML dimension and 6.5% of total variation in CC dimension in right lobe thyroid are because of serum TSH. While 9.5% of the total variation in AP dimension in left lobe is also due to serum TSH.

Conclusion: Negative and significant correlation between serum TSH and thyroid dimensions was observed. Serum TSH inversely and significantly affects all the dimensions of the right lobe and only one dimension in the left lobe.

KeyWords: Thyroid Gland, Thyrotropin, Diagnostic imaging

INTRODUCTION:

After urinary iodine level assessment, volumetric evaluation of thyroid gland (TG) has also become critical for determining the iodine status of a population as World Health Organization (WHO) suggested that normal range of thyroid gland volume (TGV) is required for large scale iodine monitoring programmes in different populations[1,2]. Reference range of normal TG is important for diagnosing goiter, thyroiditis and other thyroid diseases. TGV is also required to calculate the dose of radioiodine and also to evaluate the response of suppression treatment. It is also important to assess the TGV of such patients who are regularly undergoing long term treatment of the drugs that deranged TGV[3]. Determination of TGV is also vital for minimally invasive thyroid surgery[4].

Ultrasonography of thyroid, due to its superficial location, is considered to be the best modality because it assures high sensitivity and specificity and good scanning speed[5,7]. Due to its cost effectiveness and noninvasive approach it is considered to be the first choice to measure TGV and its morphology[8]. American Thyroid Association in 2009 suggested ultrasonography of thyroid as the most common and beneficial modality to image TG and its pathologies.

According to WHO recommended criteria to evaluate TGV, is to calculate the volume of each lobe of TG by the formula: Volume (ml) = Length in cm (Cranio-caudal dimension) x Width in cm (Medio-lateral dimension) x Depth in cm (Anterio-posterior dimension) x 0.4790. (0.479 = correction factor)[1,2].Total TGV is the sum of the volume of right and left thyroid lobes. Isthmus dimensions were not included in the measurement of thyroid gland volume as recommended by W.H.O[1,2].

Among the numbers of genetic and environmental factors that are known to effect TGV[10-18], most extensively explored are the effect induced by iodine intake and thyroid stimulating

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hormone (TSH)[12,14,19]. TSH and along with its receptor is important in, organization of the follicular cells of the thyroid and controlling TGV. After the binding of TSH to its receptors on the follicular cells, it then stimulates the growth of the follicular cells. These follicular cells in turn increase the synthesis and secretion of thyroxine[20-22].

There are studies that reported significantly negative correlation between serum TSH and TGV[11-13]. Some of the studies also reported insignificant relationship between serum TSH and TGV[10,23] Volume of each lobe of thyroid gland is the product of its 3 dimension: Anterio-posterior(AP) x medio-lateral (ML) x cranio-caudal (CC) x correction factor[1,2]. To the best of our knowledge no study reported the effect of serum TSH on thyroid dimensions. Objectives of this study is to determine the effect of serum TSH on thyroid dimensions in each lobe and also to measure the amount of effect of per unit increase in serum TSH on thyroid dimensions in each lobe.

Methodology:

A cross-sectional study was carried out at Ziauddin University hospital Karachi. This study was approved by ethical committee of Ziauddin University and hospitals. Apparently healthy subjects aged 21 years and above were recruited in the study through convenient sampling. Every participant was asked questions related to demographic profile, personal history, past history, medical and drug history. Participants with known thyroid diseases, with history of thyroid surgery, or on medications that are known to derange TGV (especially lithium, carbamazepine, phenytoin and oral contraceptive) were excluded from the study. Females with pregnancy, lactation and those who had delivered in last 12 months were also excluded due to risk of deranged TGV during this period.

Signs and symptoms related with thyroid functions were then noted to rule out unidentified cases of thyroid diseases. Physical examination of thyroid gland was then performed. All participants with enlarged thyroid gland and palpable thyroid nodule were excluded from the study. In order to recruit euthyroid participants, serum TSH level of the participants was then evaluated by chemiluminescence method. Reference range of TSH was 0.23 – 4.0 µIU/ml as used by the laboratory of Ziauddin University Hospital.

Participants having Serum TSH between 0.23 – 4.0 µIU/ml underwent ultrasonography of thyroid. Ultrasound machine Toshiba model SSA-590A with a 7.5 MHz transducer and 4 to 6 cm linear probe was used in this study. To avoid the inter observer error ultrasound was performed by a single radiologist. For the performance of ultrasound accurately standard technique for ultrasonography was followed, participants were examined in supine position, with pillow under their shoulders and their neck hyperextended. Ultrasound gel was applied all over the thyroid area of the neck. The probe was placed directly on the skin over the thyroid gland. An image for each lobe of thyroid was obtained. Medio-lateral (ML) and antero-posterior (AP) dimensions of each lobe of thyroid were noted in transverse plane. Cranio-caudal (CC) dimension for each lobe of thyroid was noted in longitudinal plane[1,2].

Statistical Analysis:

Data was entered on Microsoft excel and analyzed on SPSS version 21. Mean with standard deviations were derived for serum TSH. Kolmogorov–Smirnov test was applied to check the normality. The data failed to follow the normality assumption therefore Log transformation was applied to normalize the data. Spearman correlation was applied for evaluating the correlation between thyroid dimensions and serum TSH level. Regression analysis was applied to evaluate the amount of variation in thyroid dimensions due to per unit increase in serum TSH. P-value < 0.05 was considered as significant.

RESULTS:

Mean serum TSH of 192 participants of the study was found to be 1.56µIU/ml ±0.78 µIU/ml with minimum and maximum 0.4µIU/ml to 3.74µIU/ml. Correlation Analysis between thyroid dimensions and serum TSH are shown in table 1. Change in thyroid dimension due to per unit increase in serum TSH shown in table 2. Graph1: Regression analysis determining the inverse linear relationship between serum TSH and Right Lobe Anterio-Posterior dimension of thyroid. (RT.AP LOG= Right lobe Anterio-Posterior Log transformation, TSHLOG=TSH Log transformation). Graph 2: Regression analysis determining the inverse linear relationship between serum TSH and Right Lobe Medio-Lateral dimension of thyroid. (RT.ML LOG= Right lobe Medio-Lateral Log transformation, TSHLOG=TSH Log transformation). Graph 3: Regression analysis determining the inverse linear relationship between serum TSH and Right Lobe Cranio-Caudal dimension of thyroid. (RT.CC LOG= Right lobe Cranio-Caudal Log transformation, TSHLOG=TSH Log transformation). Graph 4: Regression analysis determining the inverse linear relationship between serum TSH and Left Lobe Anterio-Posterior dimension of thyroid. (LT.AP LOG= Left lobe Anterio-Posterior Log transformation, TSHLOG=TSH Log transformation).

DISCUSSION:

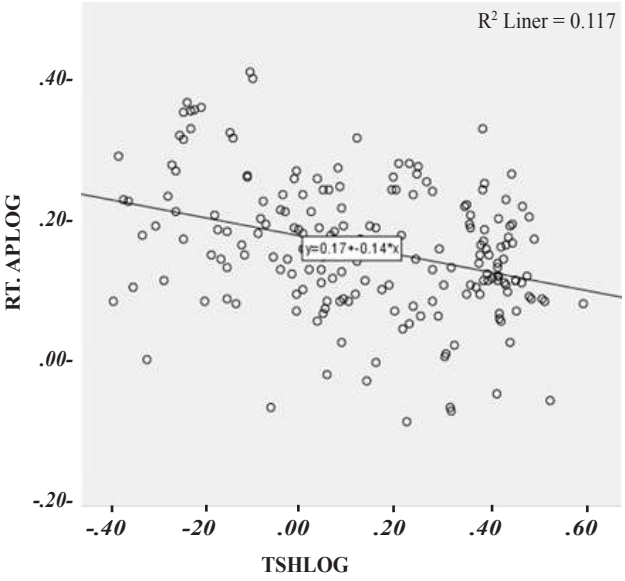
Volumetric evaluation of TGV is one of the criteria determining the iodine status of a population. Volume of each lobe of TG is the product of its 3 dimension: Anterio-posterior(AP) x medio-lateral (ML) x cranio-caudal (CC) x correction factor[1,2]. Previous studies reported either the inverse and significant relationship[11-13] or no relationship between serum TSH and TGV[10,23]. To the best of our knowledge no study reported the effect of serum TSH on thyroid dimensions. Objectives of this study were to determine the effect of serum TSH on thyroid dimensions of each lobe and also to measure the amount of effect of per

N=192	Right Lobe Dimensions			Left Lobe Dimensions		
	Anterio-posterior	Medio-lateral	Cranio-caudal	Anterio-posterior	Medio-lateral	Cranio-caudal
Correlation	-0.321	-0.177	-0.280	-0.271	-0.127	-0.122
P-Value	0.001	0.014	0.001	0.0001	0.080	0.092

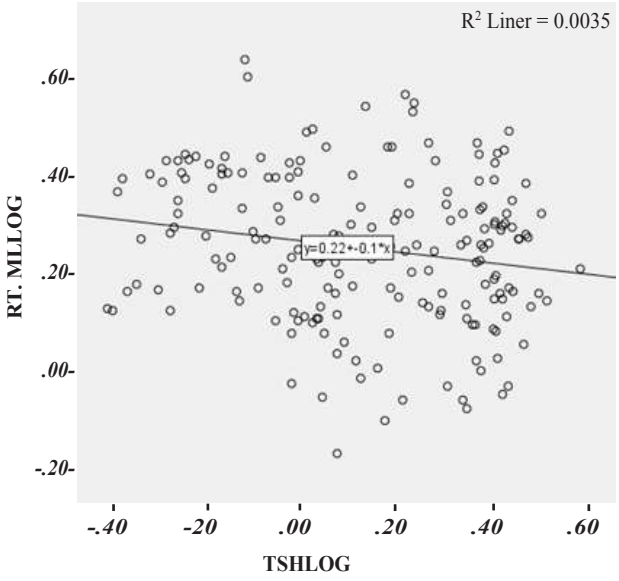
Table1: Correlation between serum TSH and Thyroid dimensions.
Correlation is significant at 0.05 level

N=192	Right Lobe Dimensions			Left Lobe Dimensions		
	Anterio-posterior	Medio-lateral	Cranio-caudal	Anterio-posterior	Medio-lateral	Cranio-caudal
Beta 1	-0.142	-0.1	-0.098	-0.147	-0.037	-0.039
B (constant)	0.174	0.223	0.449	0.158	0.200	0.434
R2	0.117	0.035	0.065	0.095	0.004	0.012
P-Value	0.001	0.009	0.001	0.001	0.397	0.132

Table2: Regression analysis between thyroid dimension and serum TSH,
Correlation is significant at 0.05 level (2-tailed)



Graph 1: Regression between serum TSH and Right Lobe Anterio-Posterior Dimension R^2 Liner = 0.117



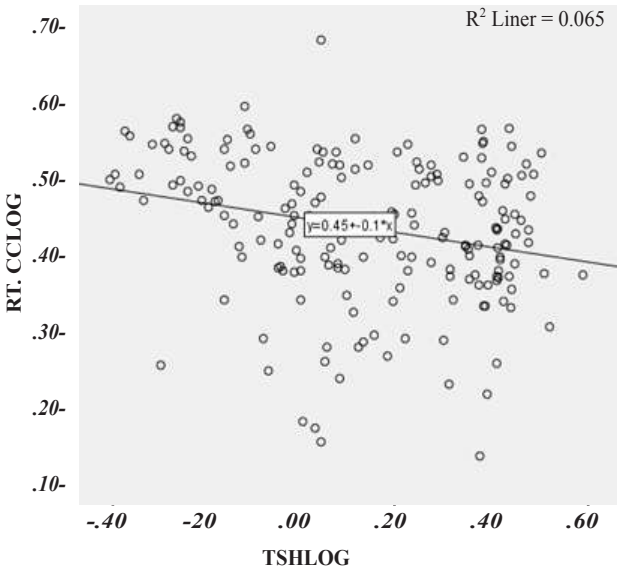
Graph 2: Regression between serum TSH and Right Lobe Medio-Lateral Dimension

unit increase in serum TSH on thyroid dimensions of each lobe.

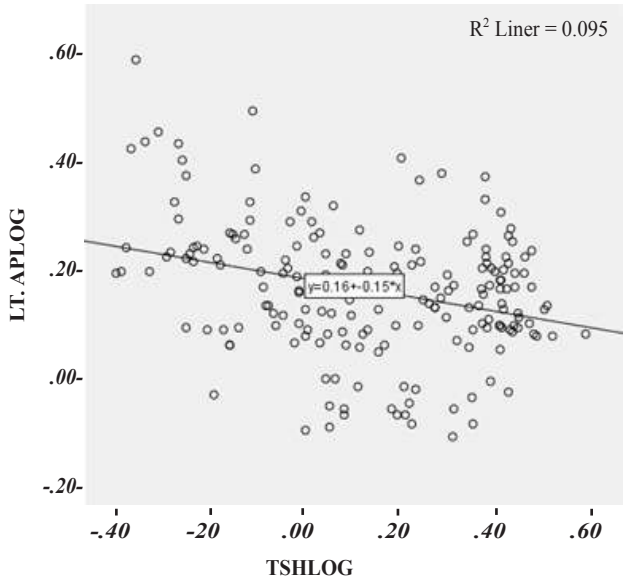
Just like the inverse effect of serum TSH on TGV as reported previously[11,13], this study reported negative correlation between serum TSH and thyroid dimensions. In the right lobe of TG, AP dimension (P-Value 0.001), ML dimension (P-Value 0.014) and CC dimension (P-Value 0.001) dimension was found to be negatively and significantly related to serum TSH. Among the three dimensions of right lobe, serum TSH demonstrated most negative correlation with AP dimension. Least negative correlation was observed between serum TSH and ML dimension of right lobe.

Regression analysis further demonstrated that with per unit increase with serum TSH, AP dimension decreases significantly by 0.142ml, ML dimension decreases significantly by 0.1ml and CC dimension decreases by 0.098ml in the right lobe of thyroid. 11.7% of total variation in AP dimension, 3.5% of total variation in ML dimension and 6.5% of total variation in CC dimension of right lobe thyroid are the result of serum TSH.

In the left lobe of thyroid, significantly negative correlation was found only between serum TSH and AP dimension. Correlation between serum TSH and left lobe ML and CC dimension was found to insignificant. This study further



Graph 3: Regression between serum TSH and Right Lobe Cranio-Caudal Dimension



Graph 4: Regression between serum TSH and Left Lobe Anterio-Posterior Dimension.

demonstrated that with per- unit increase in serum TSH only left lobe AP dimension decreased significantly by 0.147ml (P-Value=0.001). 9.5% of the total variation in AP dimension of left lobe was probably due to serum TSH. No correlation was reported between serum TSH and ML and CC dimension of left lobe of thyroid.

This study further demonstrated that if the effect of serum TSH was completely eliminated then in right lobe average of AP dimension would be 0.117cm, ML dimension would be 0.035 cm and CC dimension would be 0.06. In left lobe the average AP dimension would be 0.095 cm if the effect of serum TSH was removed.

Gomez et al., demonstrated negative and significant correlation between serum TSH and TGV in Spanish subjects (r=-0.26, P.value=0.001)[13]. Barrere et al also demonstrated inverse relationship between serum TSH and TGV among French subjects in both the genders[11]. Negative correlation between the two variables was also observed in the Karachi population (P-Value=0.03) and also between serum TSH and right lobe volume (P-Value=0.029)[12].

The overall results of this study were not in accordance to the study done by Berghout *et al in* 1987 in Amsterdam population[12] Ressmussan et al in 1989 in Danish subjects[23] and Adibi et al in 2008 in Iranian population where they failed to report any relation between serum TSH and TGV and concluded that there was a lack of significant correlation between serum TSH level and TGV[10,12,23].

Conclusion:

Previous studies reported significant relationship between serum TSH and TGV or no relationship between serum TSH and TGV. To the best of our knowledge no study reported that which thyroid dimension in each lobe was most and least likely responsible for this negative correlation. Negative and significant correlation between serum TSH and thyroid dimensions was observed in this study. Serum TSH inversely and significantly affected all the dimensions of the right lobe and only one dimension in the left lobe.

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Author Ship: This work was carried out in collaboration between all authors. Corresponding author Dr. Mahrukh Kamran designed the study, wrote the protocol, and wrote the first draft of the manuscript. Dr. Sahar Mubeen and Dr. Iffat Raza managed the literature search and critical analysis of the study. Author Dr. Sanober Bughio supported the study technically and clinically. Hira Waseem and Dr. Zainab Khaiq Ansari participated in study design, data analysis and interpretation. All authors read and approved the final manuscript.

Conflict of interest: There was no conflict of interest.

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Original Article

Effectiveness Of Transient Evoked Otoacoustic Emission (TEOAE) Test For Neonatal Auditory Screening

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ABSTARCT

Objective: The purpose of this study is to assess the efficacy of Transient Evoked Otoacoustic Emission (TEOAE) as screening test for auditory function in neonates.

Study Design: A cross-sectional study

Place and Duration of Study: This study was conducted at United Medical and Dental College, Creek General Hospital, Karachi, from July 2106 to May 2017. A total number of 120 newborn babies were screened for hearing loss before discharge from hospital but 20 were lost for follow up and 100 cases were included in this study.

Method: TEOAE was done in all neonates born during this period at 3rd day after birth. Those who were found to have hearing loss, TEOAE was repeated at the end of 1st week and again in 6th week after birth. BERA was done in those cases who showed hearing loss on TEOAE on all three occasions. All the 100 cases were followed up regularly for more than one year for appearance of any sign or symptom related with hearing loss or speech development failure.

Result: Out of 100 cases included in this study, 96 were found to have no hearing loss on TEOAE and 1 on BERA test. Remaining three cases were found to have hearing loss on both TEOAE and BERA test. True negative cases where no hearing loss was found on TEOAE and subsequent follow up were 96. True positive cases were 3 where hearing loss was found on TEOAE and BERA and also on subsequent follow-up. False positive case was 1, where hearing loss was detected on TEOAE but BERA showed normal hearing and subsequent follow-up also showed normal hearing and false negative result was not detected in any case. Sensitivity of TEOAE was found to be 100%, specificity is 98.9%, accuracy is 99%, positive predictive value is 75% and negative predictive value is 100% in this study.

Conclusion: TEOAE was found to be a cost-effective and practicable method of recognizing congenital hearing loss. It should be done in all newborns as routine screening for hearing loss.

Key words: Hearing screening, Transient evoked otoacoustic emissions; Brainstem evoked response audiometry, Congenital deafness

INTRODUCTION

The purpose of neonatal auditory screening is to recognize precisely infants with significant auditory impairment in the most quick and cost-effective way[1]. Even moderate hearing loss of less than 40db in early childhood impedes speech, language and cognitive development leading to adverse effect on social, emotional and academic performance. Regrettably, the perfect screening test for newborns has yet to be defined[2]. Recommended test according to universal newborn hearing screening programs worldwide for assessing hearing loss include Transient Evoked Otoacoustic Emissions (TEOAE) and diagnostic Brainstem Evoked Response Audiometry (BERA).

Although TEOAE is economical, fast, simple and consistent test with a sensitivity of 100% and specificity of 99%[3, 4], BERA test is the gold standard, has the additional advantage to assess function of auditory neurological pathway from periphery to the center. In contrast TEOAE is a physiological test, that measures the integrity of the outer hair cells in the cochlea. The variances in the external auditory canal and differences in the assignment and kind of earpiece can yield marked difference in the stimulus of TEOAE and therefore can lead to false negative results. The conductive pathway should be within normal limits to record TEOAE. The other advantages of BERA include measuring the average hearing threshold of frequencies at 2000-4000 Hz with high sensitivity (99%) and specificity (87%)[5, 6]. False positive results of BERA seem to be fewer[7].

The purpose of this study is to evaluate the efficacy of TEOAE as screening test for hearing in neonates in our local setup. We have used TEOAE as first screening test and BERA was done as a confirmatory diagnostic test on newborns who fail three attempts of TEOAE test. All the children were followed up for more than one year for

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appearance of any sign or symptom related with hearing loss or faulty speech development.

PATIENTS AND METHOD

This study was conducted at the department of Otorhinolaryngology, Head & Neck Surgery, Creek General Hospital, the affiliated hospital of United Medical & Dental College, Karachi, Pakistan. It was conducted from July 2016 to May 2017, over a period of 10 months, through 'hearing screening program' by an audiologist. The study was reviewed and accepted by the institutional ethical review committee (ERC) of UMDC. A total of 120 infants born at Creek General Hospital during this period were included in the study. Exclusion criteria were patients with congenital deformity of the pinna or external auditory canal and the patients lost for follow up visits.

An appropriate informational brochure for parents to assist in gratifying this responsibility was designed. A convenient sampling technique for hearing screening was adopted by collecting information through Performa filled by newborn baby's parents. Hearing screening protocol was used and Transient Evoked Otoacoustic Emissions (TEOAE) screening test was done on 3rd day after birth. Those who has abnormal TEOAE result were re-tested at the end of 1st week after birth and those who still had abnormal result were again tested on 6th week. Brainstem Evoked Response Audiometry (BERA) was done in those patients who has abnormal or failed TEOAE on all three occasions.

The screening was done at the bedside in typical postnatal ward, with the newborns in their cots or held in their mothers' arms or at NICU (Fig 1). Sedation was not required. Informed consent was taken by mothers before hearing screening. Immediate result of 'pass' or 'fail' is handedover to parents and record kept for future reference in hospital medical record. In addition, parents were instructed to return for re-screening in case of first failure at the end of first week. All patient who were declared normal after TEOAE were followed up regularly for more than one year for any deafness and language problem. All parents were also instructed to report immediately if they think their child has any problem in hearing or subsequent speech development. Data was collected and analyzed with SPSS version 23.

RESULT

During the study period of 10 months, 120 newborns were screened for hearing assessment in which 80 (66.66%) were boys and 40 (33.33%) were girls. During the first TEOAE testing, done on 3rd day after birth, out of 120 patients, 90 were found to have normal hearing (table 1). All the other 30 babies were instructed to come again after one week for retesting. Out of these 30 babies, only 10 returned for retesting after one week and other 20 were considered lost from follow up and excluded from this study. During this 2nd testing out of 10 cases, 6 were found normal and 4 were still have abnormal TEOAE result (table 1). These 4 babies

Fig. 1. Auditory screening being performed at Creek General Hospital by handheld OAE device.

with abnormal TEOAE were again tested at 6th week after birth and all of these were found to have deafness.

These 4 babies with abnormal TEOAE were then referred for BERA test and among it 3 were found to have deafness bilaterally and one has normal hearing (table 1). All the three babies with deafness bilaterally were referred for auditory rehabilitation.

Out of 100 cases included in this study, 96 were found to have no hearing loss on TEOAE and 1 on BERA test. These 97 children were followed up regularly in OPD and on phone for development of any hearing or speech problem, but all have normal hearing and normal speech development. Remaining three cases were found to have hearing loss on both TEOAE and BERA test and also found to be deaf on subsequent follow-up. So, the true negative cases where no hearing loss was found on TEOAE and subsequent follow up were 96 (fig. 2). True positive cases were 3 where hearing loss was found on TEOAE, BERA and subsequent follow-up as well. False positive case was 1, where hearing loss was detected on TEOAE but found normal on BERA and subsequent follow up. False negative result was not detected in any case where TEOAE has given result of no hearing loss and subsequently found to have hearing loss (fig. 2). Table 2 is showing details of calculation of sensitivity, specificity, accuracy, positive predictive value and negative predictive value for TEOAE. Sensitivity was found to be 100%, specificity is 98.9%, accuracy is 99%, positive predictive value is 75% and negative predictive value is 100% in this study.

DISCUSSION

Hearing during the first six months of life is essential for speech and language development. Detection of hearing loss before three months of age and appropriate therapeutic measures not later than six months is vital to improve the quality of life in children with hearing loss. Most of Pakistan's population is poor and lives in the rural areas where congenital hearing loss is very prevalent. Steps should be taken to provide facilities for evaluating hearing loss in newborn

	Total no. of patients	No Hearing Loss	Hearing Loss
1st TEOAE (at 3rd day)	120	90	30
Lost for Follow up	20	--	--
2nd TEOAE (at end of 1st week)	10	6	4
3rd TEOAE (at end of 6th week)	4	0	4
BERA (after 3 failed TEOAE)	4	1	3

Table 1. Results of TEOAE and BERA

	Formula		Result
Sensitivity	TP/TP+FN	3/3+0	100%
Specificity	TN/TN+FP	96/96+1	9 8.9%
Accuracy	TP+TN/TP+TN+FP+FN	3+96/3+96+1+0	99%
Positive predictive value	TP/TP+FP	3/3+1	75%
Negative predictive value	TN/TN+FN	96/96+0	100%

Table 2. Sensitivity, Specificity, Accuracy, Positive predictive value and Negative predictive value of TEOAE
TP = True Positive TN = True Negative FP = False Positive FN = False Negative

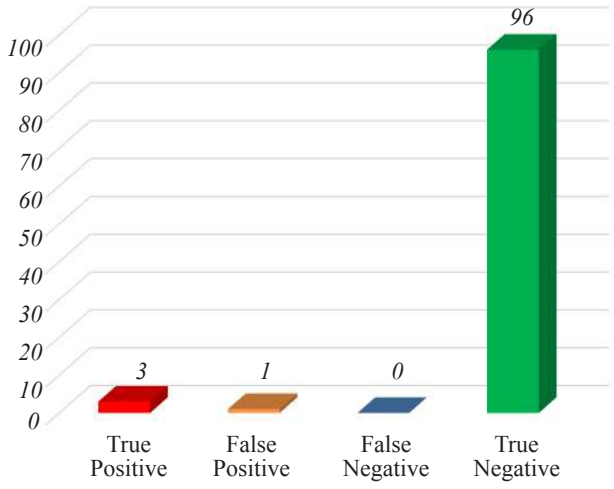

Fig. 2. No. of True Positive, False Positive, False Negative and True Negative Result on TEOAE

nurseries as part of the immediate post-delivery examination screening program[8].

For auditory screening in newborns, two approaches are used generally. One is Otoacoustic Emissions, which is based on recording of physiological sound produced by the outer hair cells of the cochlea while the other is Brainstem Evoked Response Audiometry (BERA) which is a recording of the electrical event from the brainstem in response to a sound stimulus. Both methods are generally used for auditory screening. A study by Norton et al.[9, 10] compared the efficacy of Transient Evoked Otoacoustic Emission (TEOAE), Distortion Product Otoacoustic Emissions (DPOAE) and Brainstem Evoked Response Audiometry (BERA). They observed that, all the three methods are equally good for auditory screening in newborns. None of these procedures detects hearing loss rather its goal is to objectively assess auditory function[11,12]. Numerous researchers have studied the overall cost of auditory screening in the early childhood period as well as the advantages and disadvantages of the different available methods [13,14]. Assessing which among all these is more cheap and cost-effective in our region is of great interest. The results shown in the present study concludes that it is possible to incorporate a two-stage TEOAE hearing screening and diagnostic BERA in Pakistan to assess newborn hearing at early age.

The normal outer hair cells of the cochlea not only perceive sounds, but it also generates sounds of low intensity called Otoacoustic Emission (OAE). The sound is generated by

the expansion and contraction of the outer hair cells in response to sound stimuli. These OAEs are present in healthy normal persons where hearing loss does not exceed 30db. The chief purpose of TEOAE test is to estimate status of the cochlear, precisely function of the outer hair cell in response to sounds stimulus. The sound stimulus is given in the form of a series of clicks at 80-85 db SPL using a probe which encompass a transducer. It also contains a microphone to receive OAEs generated by the outer hair cells of the cochlea. The test has certain limitation as it is affected by high environmental sounds in the surroundings and it is absent if the hearing loss is more than 40 db. On the other hand, the brainstem evoked response audiometry (BERA) is an electrophysiological measurement of the function of the auditory pathway from the cochlear nerve through the brainstem. It is mostly recorded when the babies are sleeping or sedated. Through BERA degree of hearing loss can be assessed accurately at all decibels. Hence it is valuable as a confirmatory test for hearing loss in infants and newborns. Main limitation of BERA is the cost and time involved in performing the test.

Very few studies are carried out in Pakistan about the auditory screening program in neonates[15,16]. As the neonatal hearing loss cannot be detected without a suitable test because newborns with mild to moderate hearing loss may still react to some environmental sounds, making parents imagine that their babies hearing falls within standard parameters[17]. Although comprehensive neonatal screening program have been introduced since mid-eighties but major factor contributing to late detection is the absence of proper neonatal screening program at maternity hospitals[18].

In our study out of initial 120 newborns, 20 (16.6%) were lost in follow up and patient compliance after first screening was very low. Only 10 returned for re-screening out of 30 mainly due to lack of awareness regarding screening and anxiety caused by the process. Detection of unilateral hearing loss on TEOAE is very vital in diagnosing uncommon causes of unilateral deafness such as tumor in the eighth cranial nerve[19]. Hearing device should be fitted before 6 months of age as it will improve subsequent hearing development and is considered as an initial standard goal in the management of children with hearing loss[20].

A study by Tzanakakis[21] compared TEOAE and DPOAE and concluded that TEOAEs testing is easier to perform and it is more reliable as compared to the DPOAEs test. The specificity for TEOAE was found to be 92% which is much similar to our study where we found it as 98.9%. The study by Sachdeva[22] concluded that Distortion Product Otoacoustic Emission and then confirmation by BERA is very beneficial tool in early identification of congenital hearing loss in neonates. The sensitivity for TEOAE found in our study is 100% which is much similar to another study by Iwasaki et al[5].

There are certain factors that might contribute to the delay between diagnosis and intervention in children with hearing loss in our society. It includes, low literacy rate among parents, cultural considerations, doubts about the degree of hearing loss, the benefits of hearing amplification, acceptance in wearing hearing aids, cost and technical considerations[23]. Congenital hearing loss is typically predominant in low-income population. Annually, about 740,000 children (roughly six per 1,000 live births) are detected to have sensorineural hearing impairment in low and middle-income class countries as compared with 28,000 (around two per 1,000 live births) in high income class countries[24]. Available data from the World Health Organization (WHO) suggest that approximately 7.5 million children below the age of 5 years have disabling hearing impairment worldwide, the clear majority (at least 80%) of whom reside in low and middle income countries[25.26,27].

Conclusion:

TEOAE was found to be a cost-effective, rapid and practicable method of identifying congenital hearing loss. It should be done in all newborns as routine screening for hearing loss. Our study strengthens the fact that like other developing countries where they have introduced neonatal hearing screening, the same can be implemented in Pakistan in a cost-effective way, which will help to decrease the impact on child's social, emotional, intellectual and linguistic development.

Limitations:

20 patients were lost for follow-up after first initial TEOAE test after birth who were declared failed. There might be more positive cases who had hearing loss among these 20 patients, causing a change in overall results.

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Conflict of Interest:

None

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Original Article

Efficacy Of Gauze-based Negative Pressure Wound Therapy After Split-thickness Skin Graft In The Care Of Large Wounds

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ABSTRACT

Background: Negative-pressure wound therapy (NPWT) or vacuum dressings involve the application of a controlled negative pressure on the wound. Traditionally, STSGs were fixed with bolster technique, where sutures are used to fix pressure dressings over the top of recently placed grafts. Taking it a step further in our study we applied an effective and user friendly filler material (surgical roll gauze) on very large defects. The objective of this study was to assess the clinical efficacy of gauze-based negative pressure wound therapy as an adjunctive therapy to STSG, over complex and very large wounds.

Material & Methods: This descriptive study was conducted at Army Burn Center, Combined Military Hospital Kharian and PNS Shifa Hospital Karachi from January 2016 to June 2017. Gauze based VAC system used. Negative pressure was applied at -80 mm Hg. Evaluation was carried out to assess the performance of gauze-based NPWT.

Results: Total of 63 patients, 42 males and 21 females, with mean age of 32 years SD+15 were included in the study. The wound size included in the study ranged from 12x10 cm to 88x66 cm. Mean duration of NPWT dressings was 15 days and 313 dressings were employed in total with satisfactory healing achieved in 3 to 4 VAC dressings in most of the cases. Mean duration of hospital stay was 23.92 days at which point graft uptake percentage was in the range of 90% (n=7) to 100% (n=20). Only 3.2% (n=2) cases required partial re-grafting for complete coverage of residual wounds.

Conclusion: Gauze-based Negative-pressure wound therapy over split thickness skin graft is a cost-effective addition to the care and management of large and complex wounds.

KEY WORDS: Skin graft; Vacuum Assisted Closure; Complex wounds;

INTRODUCTION

Negative-pressure wound therapy (NPWT) or vacuum dressings involve the application of a controlled negative pressure on the wound, a method invented in Germany in 1987[1], (when applied for growth of granulation tissue in open fractures, and standardized). It was patented, and published in the United States in 1997 when Morykwas & Argenta studied the use of suction applied to polyurethane foam in wounds[2].

In NPWT, also called sub-atmospheric pressure therapy, vacuum assisted closure (VAC), vacuum sealing, vacuum pack therapy, and sealing aspirative therapy, the sub-atmospheric pressure was directed at the surface of the wound through an interface (polyurethane sponge / gauze), allowing distribution of the negative pressure and use of either a constant or intermittent mode of pressure application[3].

Further utilizing the capabilities of NPWT when it is applied over the split-thickness skin graft (STSG) it proved effective in removal of serous fluid which improved protection against infections that can prevent graft take if allowed to accumulate underneath the graft[4]. Also better immobilization of the graft was achieved in anatomically challenging areas (with complicated wound geometries, irregular wound surfaces or wounds subject to movement e.g. joint proximity)[5]. All the above measures improved the close approximation of graft to the wound bed significantly improving graft take[6].

Traditionally, STSGs were fixed with Bolster technique, where sutures are used to fix pressure dressings over the top of recently placed grafts. Taking it a step further in our study we applied an effective and user friendly filler material (surgical roll gauze) on very large defects, which really pose challenge to the cost of wound care of complex wounds for prolonged period.

The objective of this study was to assess the clinical efficacy of gauze-based negative pressure wound therapy as an adjunctive therapy to STSG, over complex and very large wounds.

MATERIAL AND METHODS

Very large and complex wounds which were expected to heal over prolonged time with post healing sequelae, wounds infected with resistant organisms with persistent discharge rendering inability to successful graft uptake, presence of

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wounds with co-morbidity, extensive war wounds with limited alternate reconstructive options were included in the study. The wounds with underlying vascular repairs, osteomyelitis, or requiring flaps for effective coverage were excluded.

The wound debridement was carried out to prepare the wound bed prior to graft application. The graft was meshed at a 1:1.5 ratio and stapled to the wound bed. (Fig. 1). After graft placement, paraffin gauze was placed. The graft was then covered with layers of sterilized gauze and tubing of redivac drain with second layer of gauze over it. Finally sealed with Op-site dressing after applying tincture Benzoin-co to enhance the adhesiveness of Op-site. The tube was then connected to portable suction machine ensuring negative pressure of 80 to 100 mm of Hg. The vacuum was set to suction for 10 minutes after every 50 minutes. In more complex wounds with less preparation suction protocol was 5 min suction after every 25 min. Same protocol was followed during night where possible. Dressings were changed on every third or fourth day.

Upon removal of the NPWT dressing, the graft site was evaluated to ascertain the "success of graft uptake" (a subjective measurement based on clinical judgment) and a separate assessment of the approximate percentage area of successful and unsuccessful graft take was recorded (an objective measurement of graft success (Fig. 1). Graft sites were subsequently dressed-up with gauze dressing and patients were followed in outpatient clinic weekly after discharge from the hospital.

Data relating to patient demographics, comorbidities, duration, wound management and subsequent outcome was recorded for all patients. Continuous data with normal distribution were summarized using means and standard deviations (e.g. patient age) and medians and ranges were calculated where data did not follow a normal distribution (e.g. wound duration). Categorical data such as patient gender was calculated using frequency distributions.

RESULTS

The study included 63 patients, 42 (66.7%) males and 21 (33.3%) females, with male to female ratio of 2:1. The mean age of patients was 32 years SD+15.

Among these, 13 patients were suffering from diabetes mellitus and 2 with hypertension. Two of the patients were having concomitant genitourinary injuries causing fecal contamination of the wounds. Table 1 : Results Summary

The wound size ranged from 12x10 cm to 88x66 cm. Fifty-seven wounds were having moderate (n = 34) to high (n = 23) amount of exudate in the wound bed. Mean of 8 days SD+5 (Range = 25) were required for wound preparation before placement of STSG.

The mean duration of NPWT dressing post-operatively was 15 days and 313 dressings were employed in total. Satisfactory healing was achieved in 3 to 4 VAC dressings in the majority of cases.

The graft uptake percentage was encouraging with 90% uptake in 7 cases, 95% uptake in 12 cases, 96% uptake in 6 cases, 98% uptake in 12 cases, and 100% uptake in 20 cases. In 4 cases there were difficulties of application of VAC dressing and 3 cases had surgical site infections post-operatively but with no untoward sequelae. Only 2 (3.2%) cases required re-grafting for complete coverage of the wounds.

Mean stay in the hospital was 24 days SD+19 with 4 patients having an extended stay of 40 to 60 days and only 2 cases had a stay over 100 days. The limitation was the need of suction apparatus which required hospital stay.

An essential observation during the study was the low cost of the whole system of VAC, as 54 (85.7%) patients had to bear dressing charges of less than PKR (Pakistani Rupee) 5,000, seven (11.1 %) between 5,000 and 10,000 and only 2 (3.2 %) patients more than PKR 10,000.

DISCUSSION

Large wounds with skin loss is a nightmare for the patients as well as the treating surgeons as it prolongs the duration of treatment and are subject to various complications on the way to healing. Our study included wounds with enormous sizes and complications as evident in the figures (Fig 1 & 2) but with introduction and modification of VAC over graft and effectively reducing the cost by inclusion of commonly available sterilized surgical gauze was our mainstay modality to achieve the successful outcome.

Martinov et al[7] followed a case of wound secondary to necrotizing fasciitis for 10 years before declaring a successful outcome as perineal necrotizing fasciitis complicates the situation with contamination by feces and urine. We were able to deal a very complex perineal wound with the same environment in a shorter time and its successful outcome is evident in Fig. 2 (slide 3).

The logical benefits of employing VAC dressings in a wound include arterial vasodilation[8], stimulation of vascular proliferation[9], increase in local blood flow[10], drainage of exudates, removal of edema[11], reduction in bacterial colonization as shown by Acosta et al[12] and similar environment is the basic requirement for successful graft uptake at recipient site. Azzopardi et al[13] were able to show the evidence of decreased inflammation, and creation of a moist microenvironment beneficial to wound closure and influencing the shape and growth of the surface tissues in a way that helps healing. All these important factors for the successful graft-take make VAC an important adjunct to be used along STSG with complementary benefits.

Twelve patients in our study had wounds secondary to deep burns and underwent successful STSG with VAC after tedious wound preparation a finding similar to the study

	Comorbid		Exudate Levels		Graft Uptake			Complications		Re-grafting	
	None	DM	High	Moderate	95%	98%	100%	None	SSI	Yes	No
Number of Cases	44	13	23	34	12	12	20	56	3	2	61
Percentage	69.8	20.6	36.5	54	19	19	31	89	5	3	97
Total	60										

Figure 1: Method of wound preparation and VAC application over graft.

Figure 2: Outcome of selected cases at various stages.

carried out by Kantak et al[14] as they observed improved rate of revascularization of dermal substitutes and promotion of re-epithelialization of donor sites when wounds were applied with VAC dressings.

The advanced technology associated with the patent VAC dressing module (V.A.C. Granufoam, KCI, San Antonio, Texas)[15] makes these devices too complex for routine use due to increased cost of hospitalization and lack of training and motivation of the patient to use them which required further studies testing modifications enabling easy handling for the patients and attendants but without compromise on results[16].

When dealing with extensive wounds, sterilized polyurethane foam is not easily available hence renders it unusable for frequent change of dressings, on the other hand surgical roll gauze is available in abundance in sterilized form and proves to be cost-effective when wound dressings need to be applied frequently.

Zhao JC[17] combined hypertonic glucose along with VAC dressings to reduce the rate of infection at the recipient site with slight benefit but introduction of the fluid in the wound bed needed further processing and preparation and difficult to keep the fluid in the wound bed along application of vacuum. Similarly other modifications like silver-impregnated dressings as done by Bukovcan et al[18] and antimicrobial-impregnated dressings by Wu et al[19] to improve the outcome, although we were able to achieve comparable results but when it comes to risk cost benefits the simplicity and effectiveness, with improved outcome, achieved with gauze was unmatchable.

Furthermore, surgical roll gauze is sterilized with less bulk when compared to the unsterilized foam causing less pressure to the covering opsite. It is easy to apply and forgiving of complicated wound geometries so it could be an ideal material in this condition[20]. Also if vacuum of the dressing fails surgical gauze can give you time to change the dressing at convenience as there is no threat of surgical site infection by the synthetic un-sterilized material like foam. Also sterilized surgical gause is readily and abundantly available commodity in all the operation theaters everywhere.

There was only one case with poor graft uptake (80%) as multiple factors were involved including continuous fecal discharge nearby causing frequent infections, graft necrosis and frequent leakage of the vacuum due to difficult wound geometry in the area of perineum. (Fig. 2) A remarkable study in this regard was carried out by Lee et al[21] which involved majority of patients with perineal wounds and all were successfully treated with negative pressure therapy. This was also evident in the case report published by Vindigni V et al[22] when they treated a 42-year-old female with fournier's gangrene by NPWT.

Barendse-Hofmann et al[23] published an article in 2009 where he presented the circumferential application of VAC for a degloving injury, we were also able to produce the successful outcome of circumferential VAC application with more ease and lesser cost as evident in Fig. 1.

Although NPWT dressings and devices are more expensive than other wound-care products, cost-effective analysis as done by Koncar et al[24] and Delhougne G et al[25] shows lower treatment expenses when used judiciously and with careful patient selection.

CONCLUSION

Gauze-based negative pressure wound therapy over split thickness skin graft is an effective addition to the care and management of large and complex wounds.

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Original Article

Effects Of Ginger Extract On Glomerular Mesangial Matrix Of Kidneys In Alloxan Induced Diabetic Nephropathy Of Albino Rats

Faiza Irshad, Saira Munawar, Areej Rasheed

ABSTRACT

Background: For a long time, Diabetes mellitus has been treated with medicines derived from plants.

Objective: To evaluate the effect of Ginger aqueous extract on Glomerular mesangial matrix in Alloxan induced diabetic nephropathy of albino rats.

Materials and Methods: In this study we induced diabetes mellitus with Alloxan intraperitoneally (150 mg/kg body weight) in Experimental groups B & C. Then the rats of Experimental group C received 200mg/kg body weight of ginger aqueous extract by gavage daily for five weeks starting from 8th day after Alloxan injection.

Results: We observed that on histopathological examination, Experimental group B kidneys revealed highly increased mesangial matrix while the animals of experimental group C treated with ginger aqueous extract showed less increase in mesangial matrix as compared to experimental group B but it was more than control group A. Three groups had significant difference among them having p-values <0.001.

Conclusion: The results of the present study indicated that the co-treatment of Ginger aqueous extract prevented alloxan induced diabetic nephropathy in albino rats. The aqueous extract of Ginger showed amazing results regarding renal histopathology of diabetic rats. The overall nephroprotective effect of Ginger is probably due to a counteraction of free radicals by its antioxidant components.

KEY WORDS: Diabetes mellitus, Kidney, Diabetic nephropathy, Ginger, Alloxan

IINTRODUCTION

Diabetes mellitus (DM) is a syndrome. Its characteristic features include chronic elevated blood glucose levels and relative insulin deficiency, resistance or both[1]. More than 346 million people suffer from DM worldwide[2]. Diabetic complications include heart disease, peripheral vascular disease, nephropathy, retinopathy, neuropathy and renal failure[3]. The kidney is an organ which excretes metabolic waste products[4]. The functions of kidneys are to maintain plasma osmolality, electrolytes concentration and end products excretion[5]. Best index of functioning renal tissue is Glomerular filtration rate (GFR)[6]. One of the leading cause of end stage renal disease is considered to be diabetic nephropathy[7]. One of the structural changes in Diabetic nephropathy is expansion of mesangium. Diffuse expansion of mesangium is called diffuse diabetic glomerulosclerosis[8]. Diabetic nephropathy is due to various mechanisms. One of the pathophysiological mechanisms which is considered to be major, is the oxidative stress[9]. Alloxan is a glucose analogue and is routinely used to induce diabetes in experimental animals[10]. In rodents diabetes induced by Alloxan results in nephropathy similar to early stage clinical Diabetic Nephropathy[11]. Alloxan rapidly and selectively accumulates in pancreatic beta cells and induces DNA strand breaks in isolated rat pancreatic islets[12]. Due to its toxicity by selectively destroying insulin-producing pancreatic beta cells, it results in an insulin-dependent diabetes mellitus[13]. Zingiber Officinale Roscoe (Zingiberaceae family) is known as Ginger. Ginger is a source of antioxidants which prevent body against oxidative stress which inturn results in damage to DNA and production of free radicals[14]. Nephroprotective role of ginger is due to polyphenols in it[15]. Incidence of Diabetes is gradually increasing in our society and the use of anti-diabetic allopathic drugs is indispensible for treating it. Uncontrolled diabetes can result in early failure of kidneys. The study was designed to evaluate the effects of Ginger extract on the histological structure of kidneys in Alloxan induced diabetic nephropathy in albino rats.

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MATERIALS AND METHODS

Animals:

This study was approved by the Institutional Review Board, Federal postgraduate Medical Institute Lahore, Shaikh Zayed hospital, National Health Research Complex. IRB No: 1208. Ref No: F.39/NHRC/Admin/IRB/389. Dated: 23/11/2012. Total 45 adult wistar albino rats of male sex having weight between 250-300g were randomly selected for the study. They were brought from Veterinary Research Institute, Lahore. These rats were kept in cages in the animal house

of PGMI, Bird wood road Lahore. Free access to water and food were allowed to the rats. Chick feed No.1 (commercial brand) was given to rats. 12 hour dark/light cycle was observed at room temperature 27ºC[13]. Prior to study, animals were acclimatized to their surroundings for seven days.

Induction of diabetes:

After overnight fasting, diabetes was induced in the experimental animals by injecting Alloxan (150 mg/kg BW)[16] intraperitoneally in single dosage, (Sigma-Aldrich, Lot # BCBD6557V, Cat # A7413-10G, Pcode: 101054491, USA), prepared one hour before administration in distilled water[13]. After injection, water and food were given. To counter hypoglycemic shock, 10% glucose solution was given to drink overnight[15]. The plasma glucose concentration (non fasting) was measured by using One Touch Ultra Two Glucometer (Lifescan, Uk) in rats at day 3 after starting the injection[17,18]. The animals which had plasma glucose level above 250mg/dl were labelled as diabetics and chosen for the experiment[15]. After diabetes confirmation rats were allowed for 4 days to acclimatize to diabetic conditions.

Ginger aqueous extract preparation:

Preparation was done in PCSIR, Laboratories Complex, Lahore by the following procedure. Fresh, raw and untreated Ginger was purchased from the market. On crushed ice Ginger roots (500g) were peeled then small pieces were made. These were homogenized in 250ml ice cold water and 750ml cold, sterile 0.9% Normal saline solution to form a total volume of 1000ml. Blender was used for homogenization for 12 minutes. Then cheese cloth was used to filter it for three times. It was centrifuged at 2000rpm for ten min. Supernatant fraction was collected and normal saline was used to make its volume 1000ml. As the weight of ginger in start was 500g so the concentration of the prepared ginger extract was considered to be 500mg/ml. Extract was freeze dried in sample tubes at -20°C till the rats were fed[13]. From Department of Chemistry, Forman Christian College Lahore, active ingredients were quantified of by Gas chromatography–mass spectrometry (GC-MS).

Grouping of Animals:

The animals were divided into three groups i.e normal, non-diabetic (Group A), diabetic untreated (Group B) and diabetic plus ginger treated (group C).

1. Normal (Group A): The rats of this group received distilled water 20ml/kg body weight by gavage.

2. Diabetic (Group B): Alloxan (150 mg/kg BW)[16]. was injected intraperitoneally for induction of diabetes in rats.

3. Diabetic plus Ginger treated (Group C): After diabetes was confirmed, diabetic rats received 200mg/kg body weight of ginger aqueous extract by gavage daily for five weeks starting from eighth day after injection of Alloxan. It was labeled as the 1st day of treatment[17].

Histological studies:

After the completion of treatment, all the animals were euthanized by giving morphine 5-24 mg/kg body weight intraperitoneally as an analgesic agent[19]. and sodium pentabarbitol was intraperitoneally injected in100mg/kg body weight dose[20]. Kidneys were dissected out. Ice cold saline was used to wash the kidneys after isolation. Then they were put in tissue bottles having 10% formaldehyde for 48 hours. 5 µm thick sections were obtained by using rotary microtome and stained with haematoxylin and eosin[21] and PAS[22] for histopathological examination.

Statistical analysis:

Analysis of Data was done by SPSS 22.0. Qualitative data were reported in terms of percentage and frequency of each group. Chi-square test was used for Comparison among groups. < 0.05 P-value was significant with 95% confidence level

RESULTS

Glomerular Mesangial matrix:

PAS stained sections of kidneys revealed that glomerular mesangial matrix was normal in control group A (Fig.2) and highly increased in experimental group B (Alloxan Induced Diabetic) with narrowing of space between Bowman's capsule and glomerular capillary loops (Fig.3). Mesangial matrix was less increased in experimental group C and it was more than control group A (Fig.4). Three groups had significant difference among them having p-values <0.001. (Table.1, Fig. 1) Group wise comparison revealed that experimental (B & C Groups) had difference from control (A Group) having p-values <0.001 which was significant. (Table. 2) Experimental (B Group) had difference from experimental (C Group) having p-values <0.001 which was significant.

DISCUSSION

Diabetes Mellitus (DM) is not a single disease but a group of metabolic disorders having the common feature of hyperglycaemia[1]. Commonest form of diabetes diagnosed in childhood is diabetes mellitus Type 1. Diabetes mellitus Type 2 have strong association with obesity[23]. Diabetes induced nephropathy is one the known cause of end stage renal disease[7]. Diabetic patients with ESRD are left with the options of haemodialysis, peritoneal dialysis or kidney transplantation[24]. Hyperglycaemia increases the glycosylation of proteins (non-enzymatic) which results in formation of advanced glycosylation end-products (AGE). This increase in serum level of AGE produces changes in morphology of kidney including mesangial cell matrix expansion[25]. Expansion of mesangium results due to accumulation of extracellular matrix (ECM) with increased deposition of type IV and VI collagen, fibronectin and laminin[26]. In our research work Glomerular mesangial matrix was normal in control (A Group) and highly increased in experimental (B

Groups	Glomerular Mesangial matrix							
	Normal		Less Increased		Highly Increased		Total	
	N	%	N	%	N	%	N	%
A Group	15	100.0	0	0.0	0	0.0	15	100.0
B Group	0	0.0	0	0.0	15	100.0	15	100.0
C Group	0	0.0	15	100.0	0	0.0	15	100.0
Total	15	33.3	15	33.3	15	33.3	45	100.0

Table. 1. Status of glomerular mesangial matrix animals in control (A Group) and Experimental (B & C Groups)

(I) Groups	(J) Groups	Chi-Square	Df	P-value
A Group	B Group	26.13	1	< 0.001**
	C Group	26.13	1	< 0.001**
B Group	C Group	26.13	1	< 0.001**

Table. 2. Group wise comparison in control (A Group) and experimental (B & C Groups) groups for Status of glomerular mesangial matrix

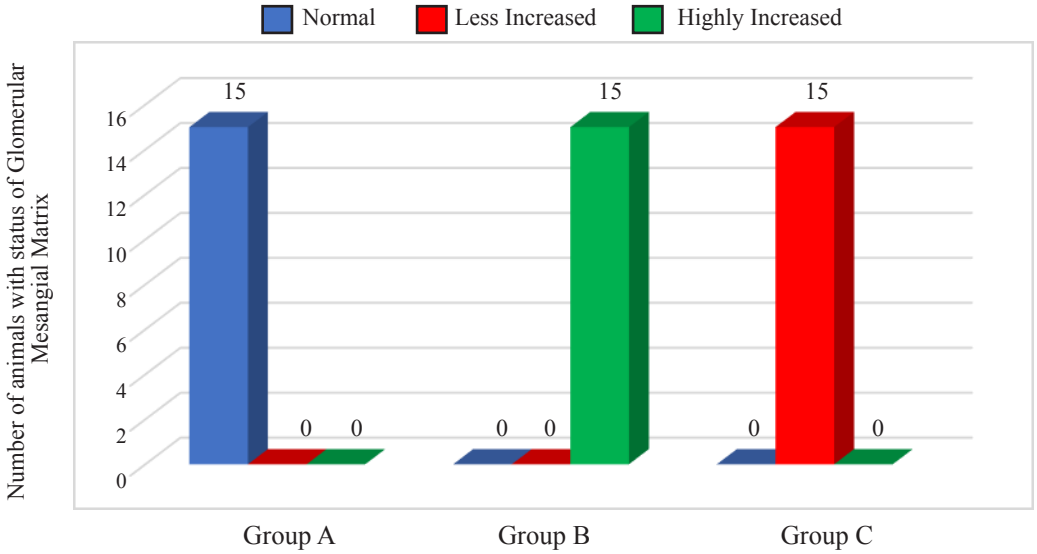

Fig.1 Status of glomerular mesangial matrix in control (A Group) and experimental (B & C Groups)

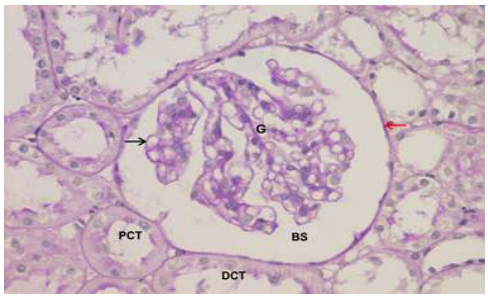

Fig.2 Photomicrograph of Cortex (CX) of kidney rat, Control (A Group) showing Bowman's space (BS), Glomerulus (G), Proximal convoluted tubule (PCT) & Distal convoluted tubule (DCT). Bowman's capsule (red arrow) and Glomerular basement membrane (black arrow).(PAS 40x)

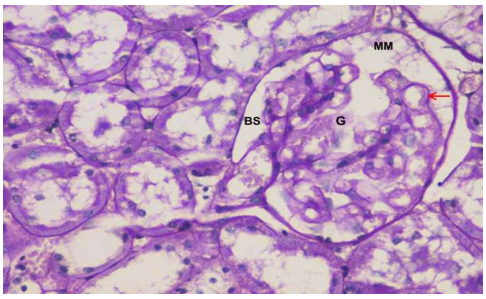

Fig.3 kidney photomicrograph of rat. Experimental (B Group) showing Cortex (CX). Glomerulus (G) with increased mesangial matrix (MM), decreased Bowman's space (BS) (PAS, 40x)

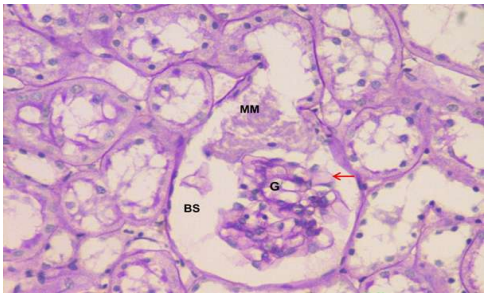

Fig.4 kidney photomicrograph of rat. Experimental (C Group) showing Cortex (CX). Glomerulus (G) with decreased mesangial matrix, increased Bowman's space (BS) (PAS, 40x)

Group) with narrowing of space between Bowman's capsule and glomerular capillary loops. Mesangial matrix was less increased in experimental group C which was treated with Ginger aqueous extract. Results coincided with the study conducted by Thing-Fong Tzeng et al[27].

Ginger is a herb used due to its antioxidant properties[14]. It reduces the elevated blood glucose levels resulting in decreased formation of advanced glycosylation end-products (AGE). It reduces the blood glucose levels due to both pancreatic and extra pancreatic mechanisms. Pancreatic mechanisms include increased release of insulin from pancreatic beta cells or release of bound insulin[17]. Extra pancreatic mechanisms include increasing glucose utilization in liver or other tissues or by reducing intestinal glucose absorption[28]. Ginger causes inhibition of oxidative damage and platelet aggregation[29,30]. It improves dementia, ulcerative colitis and cardiovascular diseases[14,31]. The effectiveness of ginger regarding prevention or suppression of cancer had been revealed in many types of cancer which include liver cancer, lymphoma, colorectal cancer, breast cancer, bladder cancer and skin cancer. The proposed mechanism of action includes induction of apoptosis, antioxidant activity, arrest in cell cycle, suppression of activator protein 1and decrease in proliferation[31].

CONCLUSION

Results of this study indicated that treatment with Ginger aqueous extract reduced the progression of diabetic nephropathy induced by Alloxan in albino rats. Aqueous extract of Ginger showed amazing results histopathologically. The overall reno-protective effect of Ginger is probably due to a counteraction of free radicals by its antioxidant components and improvement of hyperglycemic state by pancreatic and extrapancreatic mechanisms. Further studies regarding higher dosages or longer periods of treatment are needed to see the protective effect of ginger on kidneys against diabetic nephropathy in human beings.

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Original Article

Factors Associated With Timely Initiation Of Breastfeeding Among Mothers In JPMC

Beena Barkat Ali, Shazia Naseeb, Razia Korejo

ABSTARCT

Objective: Study the frequency of common factors Associated with timely initiation of breastfeeding.

Study design: Descriptive Cross sectional.

Duration and place of study: this study was conducted at, Jinnah postgraduate Medical center Karachi unit-I from 19 May to 18 November 2015.

Material & Methods: A total of 108 mother infant pairs were selected by Non probability consecutive sampling technique, meeting our inclusion criteria. Informed consent was taken after explaining the pros and cons, purpose and procedure of the study. The common factors associated with timely initiation of breastfeeding like age of the mother, gestational age, parity, educational status, working status of the mother, mode of delivery, birth weight of the baby and gender of the baby were evaluated through face to face interview of the mothers .

Results: In our study mean age of mothers found to be 26.1 years old. Mean birth interval found to be 3.1years. Mean birth weight of the babies was 2.86 kg. Mean gestational age of the Patients was 38.1weeks. Most of the babies were female 63(58%) other were male 45(42%).Out of 108 patients, 40(37%) received Primary education, 27 (25%) were graduated, 18(17%) were Illiterate, 13(12%) secondary and 10(9%) were Intermediate. Thirty eight (35.2%) belonged to middle class, 56(51.9%) to upper middle class and only 14(13%) to higher class. Fifty eight (53.7%) women were multiparae and 76(70.3%) were employed; And Mostly 66 (61%) delivered through Cesarean -Section.

Conclusion: According to this study the main conclusion of Common factors associated to timely initiation of breastfeeding were age of mothers(74.07%) more than 20years , parity 2 or more(61.1%), educational level secondary and above (50.9%), house wives (32.9%), male sex of infant (41.6%) and Vaginal mode of delivery (38.8%)

Keywords: Breastfeeding, Breastfeeding initiation, primigravidae, practices

INTRODUCTION:

Many women want to breastfeed but are unable to do so. Lack of confidence in their ability to breastfeed, problems with proper positioning of neonate, myths of inadequate milk supply, breast pain and lack of support from health professionals in early post discharge period are some reasons why breastfeeding is not initiated and if initiated is not continued for the recommended duration[2].

Antenatal counseling and postnatal lactation support, improve rates of exclusive breastfeeding. There has been a substantial improvement over the past two decades in the proportion of mothers receiving antenatal care from a skilled health provider, increasing from 26% in 1990-91 to 61 percent in 2006-07 and 73% in 2012-13. Antenatal visits provide an opportunity to educate women regarding the benefits of breastfeeding and can help improve rates of initiation of exclusive breastfeeding[1-4].

Baby Friendly Hospital Initiative was launched in 1991 by UNICEF[4] and WHO[5] to ensure that all maternity services support breastfeeding. Ten steps to successful breastfeeding need to be implemented if a health facility wants to be accredited as Baby Friendly. Step 3 of these steps is 'inform all pregnant women about benefits and management of breastfeeding'. Implementation of baby friendly hospital initiative in Sindh, Pakistan improved breastfeeding practices in some of the centers to 98.97%[5].

Breastfeeding practices in Pakistan are far from ideal. Ninety-four percent of children were reported to have been breastfed at some time. 38% percent of children less than age 6 months are exclusively breastfed. The median duration of exclusive breastfeeding is less than one 1month. Complementary foods are not introduced in a timely fashion for all children. Only 57% of breastfed children age 6-9 months received complementary foods. Overall, only 15% of children ages 6-23 months are fed appropriately based on recommended infant and young child feeding (IYCF) practices[2].

Breastfeeding offers many advantages to the newborn and the new mother. Although emphasis is put on breastfeeding rates, even then, breastfeeding often fall short of the required frequency of breastfeeding.

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The WHO[6] and American Academy of Pediatrics[7] both recommend exclusive breastfeeding for six months and complementary feeding with breastfeeding for at least 12 or 24 months. In our study 78% of women who were counselled knew that exclusive breastfeeding needs to be practiced for first six months and only 35% knew that babies less than 6 months do not need extra water. Ahmad et al report 68% of women breastfeed exclusively after breastfeeding and Dhandapany et al report that more women practice exclusive breastfeeding after counselling[8,9]

The Pakistan Demographic and Health Survey[2] also reported introduction of complementary feeding in 10% of infants less than 6 months and 19% of infants aged 4-5 months. Bottle-feeding is reported as a norm even though not supported by health professionals. More than 1 in 5 babies under two months of age are bottlefed[3]. Similar findings could not be gathered from our study, as the patients were not followed up in the postnatal period. Our study was limited in this context. Early initiation of breast feeding, especially within one hour of birth, refers to the best practice recommended by WHO[10]. Early initiation of breast feeding will directly support progress toward achieving MDG through reducing neonatal mortality[11].

In Pakistan breastfeeding is nearly universal although early initiation is not common. A survey done in 1990-91 revealed that only 8.5% of neonates were breastfed within the first hour and only 25.8% were breastfed on the day of delivery. The estimates rose to 27.2% and 65.5% in 2006-2007, shows considerable improvement[12].

The rationale of the study is that on extensive literature search study on factors associated with timely initiation of breast feeding has not been done locally and there is dearth of literature internationally as well. Therefore this study is designed to estimate the magnitude of these factors and to generate local data. Secondly some policy could be devised to highlight this issue thereby timely initiation of breast feeding could be initiated that will prevent maternal and neonatal morbidity and mortality.

MATERIAL AND METHOD

Women meeting the inclusion criteria admitted in the Department of Obstetrics and Gynecology, JPMC, Karachi, were enrolled in the study. It was a cross sectional study. Mothers were selected through non probability technique. Informed consent was taken after explaining the pros and cons, purpose and procedure of the study. The factors associated with timely initiation of breastfeeding like age of the mother, gestational age, parity, educational status, and occupation of the mother, mode of delivery, birth weight of the baby and gender of the baby were evaluated through face to face interview of the mothers and confirmed by hospital records and documented on structured Performa .

SPSS version 20 was used for data entry and analysis. Mean±SD was calculated for age of the women and gestational age at delivery, birth weight of the baby and birth interval. Frequency and percentages were calculated for gender of the baby, parity, educational level, mode of delivery, occupation of women, family monthly income and family structure (nuclear or extended). Effect modifiers were controlled through stratification of family monthly income, family structure (nuclear or extended) and birth interval to determine the effect of these on outcomes. Chi square test were applied and p value =0.05 was taken as significant.

RESULTS:

Mean age of the patients was 26.1 years ranging from (18-35) years. Mean birth interval of the baby was 3.1years. Mean birth weight of the baby was 2.8 Kg. Mean gestational age of the Patients was 38.1 weeks. The gender distribution of the baby most of the babies were female 63(58%) other were male 45(42%). Out of 108 mothers 18(17%) were Illiterate, 40(37%) were Primary educated, 13(12%), were secondary, 10(9%) were Intermediate and 27 (25%) were graduated. The distribution of monthly income of mother women 38(35.2%) belong to middle class (monthly income <25,000 RS.), 56(51.9%) to upper middle class (monthly income 25,000-50,000 RS.) and only 14(13%) belong to higher class (monthly income >50,000 RS.). Fifty-Eight (53.7%) women had multiparty. Most of the women were employed 76(70.3%). Forty-two patients (38.9%) women belonged to age 26-30 years with next majority between 21-25 years i.e. 36 (33.3%) and only 5(4.7%) patients were more than 30 years of age. The gestational ages at delivery ranged from 34 to 42 weeks but most of them belong to gestational age more than 37 weeks i-e 80(74%). Most of the women 66(61%) who have delivered baby through C-Section. Effect modifiers were controlled through stratification of family monthly income, family structure (nuclear or extended) and birth interval to determine the effect of these on outcomes. Chi square test was applied and p value =0.05 was taken as significant as shown on (Table-2-3). There was significant association is seen family income and gender together affecting breast feeding(table-2),significant association is seen family income and Parity, family income and gest.age affecting breast feeding(Table-3) and significant association is also seen family structure and education, family structure and mode of delivery affecting breast feeding(Table-4).and birth interval and parity, birth interval and gest. Age are also showing significant association.

DISCUSSION:

Breastfeeding is advocated as an important child survival strategy by the World Health Organization especially in countries with poor socioeconomic background[1-2]. Breast-feeding is fundamental to the health and development of children and important for the health of their mother as well.

In Pakistan breastfeeding is nearly universal although early initiation is not common. A survey done in 1990-91 revealed that only 8.5% of neonates were breastfed within the first

CHARACTERISTICS OF MOTHERS	FREQUENCY	PERCENTAGES (%)
Age		
<20 Years	25	23.1%
21-25 Years	36	33.3%
26-30 Years	42	38.9%
>30 Years	5	4.7%
Parity		
Primiparae	42	38.9%
Multiparae	58	53.7%
Grand multiparae	8	0.4%
Educational Status		
Illiterate	18	17%
primary	40	37%
secondary	13	13%
Intermediate	10	9%
Graduate	27	25%
Gender of Baby		
Male	45	42%
Female	63	58%
Birth Weight of baby		
<3kg	35	32%
>3kg	73	68%
Mode of Delivery		
Vaginal delivery	42	39%
Cesarean- sections	66	61%
Profession of Mothers		
House wife	32	29.7%
Working	76	70.3%

Table 1. Demographic and Obstetric Characteristics of Mothers n=108

	Age more than 20 years	Age less than 20 years	Total	P-value	Baby Gender Male	Female	Total	P-value
Family Income Rs < 25,000 Rs 25-50.000 Rs >50,000	20(18.5%) 47(43.5%) 13(12%)	18(16.7%) 09(8.3%) 1(0.9%)	38(35.2%) 56(51.9%) 14(13%)	0.001*	30(27.8%) 10(9.3%) 05(4.6%)	8(7.4%) 46(42.6%) 09(8.3%)	38(35.2%) 56(51.9%) 14(13%)	0.000*
Family Structure Nuclear Extended	35(33%) 45(42.5%)	03(2.8%) 23(21.7%)	38(35.8%) 68(64.2%)	0.004*	16(14.8%) 29(26.9%)	29(26.9%) 34(31.5%)	45(41.7%) 63(58.3%)	0.276
Birth Interval 1-2 3-4 >5	45(41.7%) 35(32.4%) 0(0%)	16(14.8%) 10(9.3%) 2(1.9%)	38(35.8%) 68(64.2%) 68(64.2%)	0.049	25(23.1%) 13(12%) 2(1.9%)	36(33.3%) 32(29.6%) 0(0%)	61(56.5%) 45(41.7%) 2(1.9%)	0.079

Table 2. Association of Family Income and Gender affecting breast feeding

	Parity 2 &>2	Parity <2			Gest.Age Full term baby 37-42	<37 Weeks		
Family Income Rs < 25,000 Rs 25-50.000 Rs >50,000	15(41.7%) 39(18.5%) 12(0.9%)	23(14.8%) 17(23.1%) 2(0.9%)	38(35.2%) 56(51.9%) 14(13%)	0.002*	28(25.9%) 46(42.6%) 06(5.6%)	10(9.3%) 10(9.3%) 08(7.4%)	38(35.2%) 56(51.9%) 14(13%)	0.011*
Family Structure Nuclear Extended	25(23.1%) 41(38%)	15(13.9%) 27(25%)	45(37%) 68(63%)	0.820	30(27.8%) 50(46.3%)	15(13.9%) 13(12%)	45(41.7%) 63(58.3%)	0.276
Birth Interval 1-2 3-4 >5	45(41.7%) 20(18.5%) 1(0.9%)	16(14.8%) 25(23.1%) 1(0.9%)	61(56.5%) 45(41.7%) 2(1.9%)	0.009*	51(47.2%) 29(26.9%) 0(0%)	36(9.3%) 32(14.8%) 2(1.9%)	61(56.5%) 45(41.7%) 2(1.9%)	0.005*

Table 3. Association Family income with Parity of the Mothers and Gestational age

	Education Level: secondary & above	Primary or less			Spontaneous vaginal delivery	C section		
Family Income Rs < 25,000 Rs 25,50.000 Rs >50,000	23(21.3%) 30(27.8%) 05(4.6%)	15(13.9%) 26(24.1%) 9(8.3%)	38(35.2%) 56(51.9%) 14(13%)	0.282	15(13.9%) 24(22.4%) 03(2.8%)	23(21.3%) 33(30.6%) 10(9.3%)	38(35.2%) 56(51.9%) 14(13%)	0.445
Family Structure Nuclear Extended	30(27.8%) 20(18.5%)	15(13.9%) 43(39.8%)	45(41.7%) 63(58.3%)	0.000*	29(26.9%) 13(12%)	16(14.8%) 50(46.3%)	45(41.7%) 63(58.3%)	0.000*
Birth Interval 1-2 (years) 3-4 >5	40(37%) 10(9.3%) 0(0%)	21(19.4%) 35(32.4%) 2(1.9%)	61(56.5%) 45(41.7%) 2(1.9%)	0.000*	24(22.2%) 17(15.7%) 1(0.9%)	10(34.3%) 16(25.9%) 1(0.9%)	61(56.5%) 45(41.7%) 2(1.9%)	0.936

Table 4. Association of Family structure, birth interval and mode of delivery

hour and only 25.8% were breastfed on the day of delivery. The estimates rose to 27.2% and 65.5% in 2006-2007, shows considerable improvement[12].

Promotion of early initiation of breast feeding is necessary for the prevention of avoidable deaths of children as different studies have proved that death rate is high when breast feeding started late[13]. It is shown from different studies that factors like antenatal visits, knowledge about breast feeding, number of live births, age of mother, mode of delivery, her education, occupation and economical status all have strong association with early initiation of breast feeding.

Breastfeeding is multi-factorial in nature and different factors will be at play depending on individual circumstances. We found similar results when we compared our study with a study which was done at Saudi Arabia in that study. The independent predictors of timely initiation were mothers who refrain from prelacteal feeding (16%) and mother's residence rural area (19.2%), absence of breast problems (12.7%) and parity 2 0r more 27%.10 other factors were age >20 years (11.34%), educational level secondary and above (22%), house wife (11.8%), male sex of infant (13.4%). Full term (12.6%), mode of delivery; spontaneous vaginal delivery (13%)[14].

Sharma A et al[15] also found significant association similar to our study between early initiation of breast feeding with education, occupation and economic status of the mother but reported no significant association with maternal age, type of family, family size and live birth. Setegn et al [16] also reported same as formal educated women were 1.4 times as likely to initiate breast feeding with first hour of delivery.

In many developing countries particularly in Asia, the converse is true and extended lactation is more frequent in poor uneducated women in rural areas, and in urban areas higher level of education are negatively associated with breast feeding initiation and duration[17-18].

Other studies in Jeddah, Saudi Arabia by Fida and Al-Aama (2003) and Shawky and Abalkhail (2003)[19-22] included 21% of university graduated women (Fida & Al-Aama, 2003), 39.5% illiterate women and 88% housewives (Shawky & Abalkhail, 2003)[22-25]. A more recent study, which also was done in a private hospital in Jeddah, Saudi Arabia (Mosalli et al, 2012)[23] reported fewer multiparous (54%), graduated (24%), and caesarean delivery (31%) women compared with current study. However, Mosalli et al. (2012) reported similar percentages of housewives (78%) and similar age group distribution.

Many studies have indicated that a woman's obstetric experience may influence her breast-feeding behaviors. Our study shows positive association with vaginal delivery while some researchers[24] have found no association between mode

of delivery and breastfeeding, but others[25] have reported a negative association between cesarean delivery and breast-feeding initiation but not duration once breast feeding has commenced.

Conclusion:

Hence we conclude that age of mother (being more than 20 years), having two or more children, having at least secondary level of education, having male last child, having last birth by spontaneous vaginal delivery and being a house wife were factors responsible for timely initiation of breast feeding in our study.

Recommendation:

In the light of our findings we recommend that breastfeeding education should be in conjunction with obstetrics. Hence two clinics should be merged into one at Jinnah Postgraduate Medical Center Karachi.

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Original Article

Etiology, Patterns And Treatment Modalities For Mandibular Fractures

Muhammad Asif Shahzad, Momin Ayub Marath , Daud Mirza

ABSTRACT

Objective: The objective of current study was to evaluate the etiology, patterns of presentation, frequency and different treatment modalities for mandibular fractures in patients treated at Lahore Medical and Dental College/Ghurki Trust Teaching Hospital (LMDC/GTTH).

Methodology: This descriptive – cross sectional study was conducted at Lahore Medical and Dental College, Lahore/Ghurki Trust Teaching Hospital (LMDC/GTTH) from March 2015 to September 2017. The current study included one hundred and twelve (112) patients who were indentified having mandibular fractures. Data were collected regarding patient's age, gender, etiology, site of fracture, patterns and treatment modalities and analyzed using SPSS version 20.

Results: The patients' ages were between 3 to 55 years (24.87±10.867, mean/SD). The majority of fractures occurred amongst 21-30 years of age group having female to male ratio of 1:5.6. Road traffic accident (RTA) was the most frequent etiological factor for mandibular fractures in 89 (79.47%) of patients, followed by assaults 11(09.82%) and fall 07 (06.25%). A total of 189 fractures were recorded in 112 patients giving a mean of 1.7 fractures per patient. Out of 189 fractures, the parasymphysis was the most prominent site of mandibular fractures(43.39%), followed by condyle (22.75%) and angle (15.87%). The treatment modality of open reduction and internal fixation (ORIF/ORIF with IMF) was performed in 88(78.57%) of patients while closed reduction and indirect fixation (IMF with eyelet wiring/arch bar elastics & splint fixation) was done in 24 (21.43%) of patients.

Conclusion: As evidenced by the present study, road traffic accidents are the most common cause of mandibular fractures in young adults, mostly due to violation of traffic rules. These findings highlight the need to reinforce legislation for prevention of such injuries both in children and adults.

KEY WORDS: Mandibular fractures, Road traffic accidents, Open reduction and internal fixation, Etiology

INTRODUCTION:

The maxillofacial area is anatomically the most exposed part of the body, being more susceptible to injuries[1]. These injuries frequently result in varying degree of disfigurement, functional deficit and psychological problems[2]. The sheer pace of modern life with its high speed travels as well as an increasingly violent and intolerant society has made facial trauma a form of social disease to which no one is immune[3]. Mandibular fractures are amongst the common facial injuries treated in a trauma center, accounting for 36 to 59 % of all facial fractures[4]. Young men are more predisposed to trauma in the second and third decades of life owing to the fact that they frequently engage in outdoor and high risk activities[5]. The most favorable sites of fractures (in descending order) in the mandible are the parasymphysis, body, angle, condylar region, symphysis and coronoid process[6].

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The etiologies of mandibular fractures, incidence and patterns tend to vary with geographic region, socioeconomic status, culture, environmental and technologic factors. Therefore the main cause for mandibular fractures described in literature remains inconsistent[7]. Road traffic accident (RTA) has been reported as the leading etiology in the developing nations, while incidence due to personal violence is more in developed countries[8,9].

Since the last few decades, open reduction and internal fixation (ORIF) using titanium miniplates has become the treatment of choice whenever possible. This has resulted in improved oral hygiene, mouth opening, better speech and patient's earlier return to function and work. Also, a decreased preference and decline has been recorded in the use of wire osteosynthesis and closed reduction and indirect fixation (CRIF) techniques[10,11].

Over the years, the epidemiology of mandibular fractures keeps changing and new trends in etiology, pattern of presentation and management are constantly evolving[12]. This, therefore, necessitates a constant appraisal of these fractures injuries in order to keep abreast with recent developments and changing pattern of their management.

The objective of current study was to evaluate the etiological factors, patterns of presentation, frequency and different treatment modalities for mandibular fractures in patients treated at Lahore Medical and Dental College/Ghurki Trust Teaching Hospital (LMDC/GTTH). This study, in turn, will help the health care providers in a clearer understanding of

the different etiological factors involved and pattern of mandibular fractures while managing these injuries. The study may also provide circumstantial evidence for the recommendation of possible preventive measures and enforcement of seat belt legislation.

METHODOLOGY:

This study was conducted in the Department of Oral and Maxillofacial Surgery, Lahore Medical Dental College / Ghurki Trust Teaching Hospital, Lahore from March 2015 to September 2017.

The patients attending the Accident and Emergency Department as well as Outpatient Section/Department of Oral and Maxillofacial Surgery at Lahore Medical & Dental College / Ghurki Trust Teaching Hospital, Lahore were thoroughly assessed.

All the consecutive patients of any age and either gender having clinical and radiological evidence of mandibular fractures were included in the current study. Medically compromised, previously maltreated and untreated patients were excluded.

The patients were assessed with thorough history and clinical examination and information obtained was filled up in the patient's departmental records. Specific radiographs such as OPG (orthopentomogram) and PA (postero anterior) mandible were obtained to confirm the bony fractures. CT scan and intra-oral radiographs (periapical/occlusal) were prescribed if needed. Classification of fractures was done using standard nomenclature. An appropriated treatment plan was devised and executed after obtaining written informed consent of the patient. The pattern and management of mandibular fractures were compiled according to age, gender, etiology, anatomic site, relative frequency and methods of fixation.

Open reduction and internal fixation (ORIF) under GA (general anesthesia) was the preferred method of treatment for the mandibular fractures whenever possible (Fig 4 & 5). However, closed reduction and indirect fixation techniques were also used for mandibular fractures, with patients under local anesthesia (LA). IMF (intermaxillary fixation) with eyelet wiring was performed for patients who were unable to undergo GA, having financial issues and favourable mandibular fractures without significant displacement. While IMF (arch bar with elastics) was preferably used for condylar fractures. The patients below 12 years (in primary/mixed dentition) were treated under GA because of their uncooperative behavior. Splint fixation under GA was the method of choice for pediatric patients along with edentulous patients with atrophic mandible. A follow up of six weeks was done for all the patients.

The data collected from departmental records was analyzed using SPSS version 20. The qualitative variables like gender, etiology, pattern, anatomic site and treatment modalities were presented as frequency and percentages. While quantitative variable like age was presented by mean and standard deviation. A value of $p<0.05$ was considered significant with a confidence interval of 95%. We did not apply any inferential test as the study was descriptive in nature.

RESULTS:

During the period of March 2015 to September 2017, a total of 112 patients with 189 mandibular fractures were managed at Lahore Medical and Dental College/Ghurki Trust Teaching Hospital (LMDC/GTTH).

The patients' ages were between 3 to 55 years (24.87±10.867, mean/SD). The majority of fractures occurred amongst the 21-30 years of age group (n=49; 43.75%). There were 17 females and 95 males with female to male ratio of 1:5.6 (Figure 1).

Road traffic accident (RTA) was the most frequent etiology in 89 (79.46%) of patients, followed by assaults 11(09.82%), fall 09 (08.04%) and sports 02 (01.79%) (Figure 2).

The location and anatomical positions of fractures were determined in the mandible. 189 lines were detected in 112 patients with fractured mandibles, which were due to variations in mandibular fractures in each patient. It gave a mean of 1.7 fractures per patient.

Out of 189 fractures, the most prominent site of mandibular fractures was parasymphysis (n=82; 43.39%), followed by condyle (n=43;22.75%), angle (n=30;15.87%), body (n=20;10.58%), dentoalveolar (n=6;3.17%), symphysis (n=5;02.65%), ramus (n=2;01.06%), and coronoid (n=1;0.53%) (Table 1).

By excluding the symphysis and dentoalveolar fractures, out of 178 fractures, 98 (55.06%) were present on the right side and 80 (44.94%) on the left side. The mandible had a single fracture (unifocal) in 43(38.39%) of cases, 61(54.47%) had two fractures (bifocal) and 08(07.14%) with three fractures (trifocal) in mandible. The most common combinations in 112 patients were parasymphysis/condyle (n=27; 24.11%), followed by parasymphysis/angle (n=21; 18.75%), body/angle (n=04; 03.57%), parasymphysis/body (n=3; 02.68%) and (n=2; 1.79%) body/condyle.

The mandibular fractures were managed by using different treatment modalities of reduction and fixation (Figure 3). Out of the 112 patients, the technique of ORIF using miniplates was applied in 51(45.54%). 09(08.03%) were treated by ORIF with additional postoperative IMF using eyelet wiring, while ORIF with postoperative IMF using arch bar and elastics were used in 28(25.00%) of patients. The additional IMF was used in these patients due to multiple mandibular fractures usually in association with condylar region. Closed reduction and indirect fixation (CRIF) alone was the treatment of choice in 24(21.43%) of the patients, namely a non surgical approach of IMF. 06 (0.5.36%) of

them used IMF (with eyelet wiring) and 05 (04.47%) by IMF (with arch bar and elastics), mainly used to treat condylar fractures. Also 06 (05.36%) used wire composite splinting/or arch bar. In 07(06.25%) of pediatric patients, occlusal splint fixation with circum-mandibular wiring was used as the treatment of choice, while 02(01.79%) of the children were treated by ORIF with resorbable miniplates.

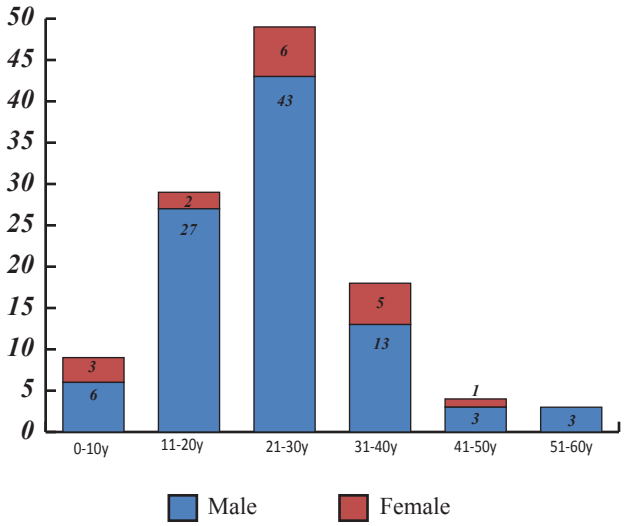

Figure 1: Age and Gender Distribution

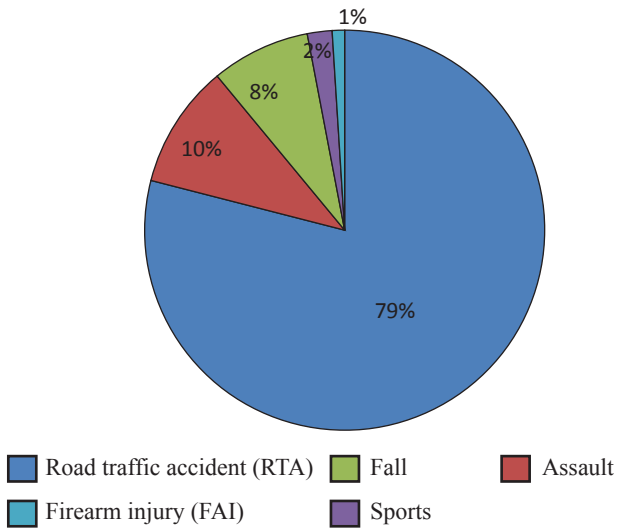

Figure 2: Etiology of Mandibular Fractures

Fracture Site	No of Fracture (n = 189)	%
Symphysis	05	02.65
Parasymphysis	82	43.39
Body	20	10.58
Angle	30	15.87
Condyle	43	22.75
Ramus	02	01.06
Dentoalveolar	06	03.17
Coronoid	01	00.53
Total	189	100.00

Table 1: Anatomical Location of Mandibular Fractures

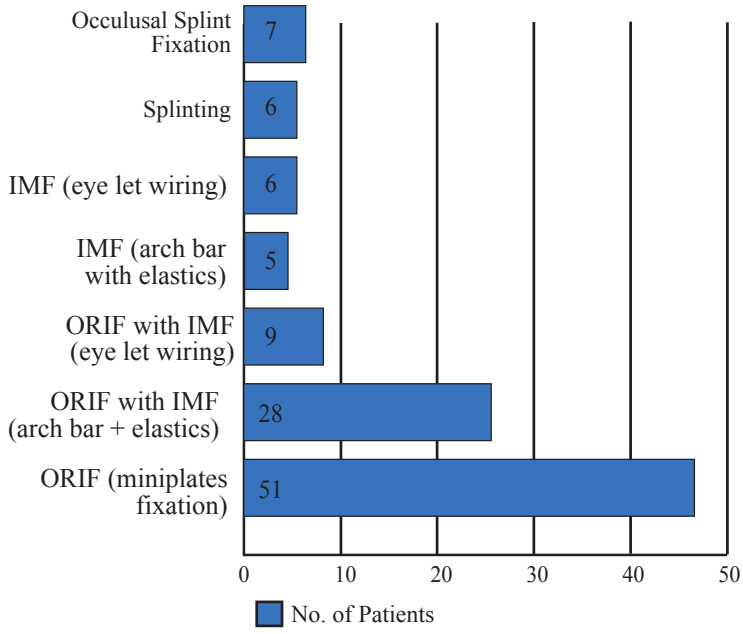

Figure 3: Treatment Modalities for Mandibular Fractures

Figure 4: Open reduction and internal fixation (ORIF) of parasymphyseal fracture (R) with titanium miniplates

Figure 5: (ORIF) of mandibular angle fracture (L)

DISCUSSION:

All over the world, maxillofacial injuries have continued to generate discussion among researchers, due to the functional and cosmetic deformities affecting the victims. The etiological factors, incidence and pattern of mandibular fractures tend to vary with geographic region, socioeconomic status, culture, religion and era[13]. Most of the literature confirms the predominance of mandibular trauma in 21-30 years of age group[9,14]. This assertion is supported by our study in which 49 (43.75%) of patients were between the ages of 21 to 30 years. The possible explanation can be attributed to the fact is that people in this age group take part in dangerous exercises and sports, careless driving of motor vehicles and are more likely to be involved in violence.

A higher frequency of mandibular fractures in males than females has been reported in most of the conducted studies[9,15]. In present study it remained 5.6:1, that is higher than reported by Boffano et al[13] (2.2:1). This finding is understandable and could be related to the fact that men are active and more exposed, due to their more frequent participation in outdoor and high risk activities such as driving vehicles, and sports that involve physical contact. Men are also more involved in violent interaction along with drugs and alcohol habits.

Our study highlights that road traffic accident (79.46%) was the most frequent etiology of mandibular, followed by assault (09.82%), fall (08.04%) and sports (01.79%),which is in agreement with other studies conducted in developing countries[14,16], while other studies have reported the assault as the most common cause of fracture[17]. Apart from RTA and assaults, other common cause of mandibular fractures include sporting injuries, falls, domestic accidents and industrial injuries[12]. These etiological variations reflect differences in the socio-economic factors, national infrastructure development(particularly roadways, traffic regulations and legislation) and other behavioral habits, such as alcohol consumption or criminal activities. The reasons for this higher rate of RTA in our region include poor road networks, improper licensing of drivers/riders, non usage of seatbelts, neglect of helmets by motorbike riders, addiction of drugs or alcohol and non compliance with traffic rules among others.

As revealed by the current study, the most prominent site of fracture in mandible was the parasymphysis region (43.39%), which is consistent with the findings of Sunita Malik *et al*[18]. However, the present study was not in agreement with the results of Nair[19] and Adebayo[20] who showed the body as the most common site, whereas Van Beek[21] observed the condyle and Chalya *et al*[22]. stated the angle region as the most frequent site of fracture. The parasymphysis/condyle (n=27; 24.11%), has been described as the most frequent combination in mandibular fractures, followed by parasymphysis/angle (n=21; 18.75%), These finding are consistent with the observations of Ogundare *et al*.[23] However, Abiose[24] reported bilateral body as the most frequent mandibular fracture combination. The particular reason for these variations is difficult to describe but one can assume that inter-population difference in the sites of maxillofacial fractures may be attributed to the diverse etiologic factors involved.

Over the last few decades, open reduction and internal fixation (ORIF) using titanium miniplates has become the treatment of choice whenever possible[10,11,25,26]. Open reduction and internal fixation (ORIF/ORIF with IMF) was performed in 88(78.57%) of patients while closed reduction and indirect fixation (IMF with eyelet wiring/arch bar elastics & splint fixation) was done in 24 (21.43%) of patients. All the treatment modalities were used without any device for external fixation achieving satisfactory results.

Al Moraissi et al[25] and Ellis E III[26] has also recommended

the use of ORIF, whenever possible. Whereas Chandra[27] and Kilasara[28] found that most of the mandibular fractures could be managed by closed reduction. The method of ORIF has been advocated to be the "gold standard" for the treatment of mandibular fractures. This has resulted in improved oral hygiene, mouth opening, better speech and patient's earlier return to function and work. However, this form of treatment has not become popular in our country due to lack of expertise (*i.e*. maxillofacial surgeons) and reduced facilities for open reduction and internal fixation; even when available, the cost of the treatment is usually prohibitive.

CONCLUSION/RECOMMENDATIONS:

This current study shows that the majority of fractures occurred amongst the 21-30 years of age group having female to male ratio of 1:5.6. Road traffic accident (RTA) was the most frequent etiological factor for mandibular fractures. Among the mandibular fractures, the most common site involved was the parasymphysis followed by condylar region. The most frequent technique used was ORIF/ORIF with IMF of patients.

As evidenced by the present study that the road traffic accidents are the leading cause of mandibular fractures in young adults, mostly due to traffic rules violations. These finding should alert the authorities to the need for the enforcement of existing traffic laws to control excessive speed on highways and careless driving; provision of better roads; and the use of safety belts is to be made compulsory. It is also recommended that there is need of cooperation and coordination among the various medical disciplines for a rapid management of maxillofacial injuries which might prevent functional as well as aesthetic morbidity.

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Original Article

Temporomandibular Joint Disorders And Gender Differences Among Habitants Of Karachi

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ABSTRACT:

Background: This study aimed to determine the prevalence of TMDs among the sample of Karachi and to observe the most frequent TMJ sound in this population.

Methodology: It was a cross sectional study conducted from Sep 2017 to Nov 2017. Three hundred patients were selected through cluster sample technique from the public/private dental institutes and private dental clinics of Karachi. The data was collected with the help of questionnaire and intraoral examination was performed by the researchers. All those patients with complain of TMDs and between 20-75 years were included in this study. The frequency and association between gender and TMDs were assessed through the application of Chi square.

Results: There were more males (n=162, 54%) and (n=138, 46%) females in this study. Majority of participants fall under the age group of 20-30 years of age. Most common TMDs symptom among male was pain during mastication (n=104, 64%) and most common symptoms among female was pain on neck/cervical area which was (n=92, 66%). Headache and earache was the least common symptom among both genders and p-value was 0.003 and 0.024 respectively. Clicking was the most common TMJ sound found among both genders, in male it was (n=58, 35.8%) and in female it was (n=48, 34.7%) followed by crepitation. Regarding parafunctional habits; majority of females (n=95, 68.8%) were in habit of clenching than male (n=60, 37%) and p-value was 0.0001 followed by tooth grinding which was also found mostly in female (n=64, 46.3%) then male (n=10, 6.1%) and p-value was 0.0001. Regarding the risk factors of TMDs; while examination majority of females were found with disturbed articulation,(n= 37,26.8%) and in male it was (n=10, 6.1%), significance difference was found between both genders and p-value was 0.0001. Stress was found to be most common risk factor and aggravating factor of TMDs among both genders. Missing teeth were found in both gender; (n=100, 61.7%) male and (n=71, 51.4%) female and calculated p-value was 0.047.

Conclusion: It was inferred from this study that greater prevalence of TMDs was mostly found in female gender. The statistically significant difference was found among stress as an aggravating factor of TMDs and gender. Clicking was the most prevalent TMJ sound and clenching was the most frequently observed parafunctional habit among both gender, followed by tooth grinding and statistically significant difference found among both gender.

KEYWORDS: Temporomandibular Joint, Temporomandibular Joint Disorders

INTRODUCTION:

Temporomandibular joint disorders (TMDs) have been an enigma in the world of dental literature. It accounts for the second most common pain in intraoral and circum-oral region[1]. Temporomandibular Joint (TMJ) is a main component of stomatognathic system which aids in diverse functioning of mandible, speech, chewing, and swallowing[2]. Any disruption in the structure of TMJ leads to the development of TMDs. The typical features involved in TMDs are pain and fatigue in muscles of mastication, pain in preauriclar region, headache, jaw joint noises, pain in neck and cervical spine, disability in mastication, mandibular deviation, limited movement of TMJ[3]. The etiology of TMJ is multi factorial with multiple predisposing and aggravating factors[1,4].

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Patient strives for dental treatment in case of pain in TMJ. Majority of patients experienced pain during jaw movements, mastication; palpation and tenderness in muscles of mastication and pain at rest[5]. This pain is mainly due to alteration in muscle's activity and its further damage is prevented by limiting jaw movements which promotes healing of stomatognathic system[6]. TMDs can be an upshot of discomfort in non-dental part of the orofacial region, and there is a positive correlation present between prevalence of headaches and TMDs[6].

Crepitation and clicking are the most occurring TMJ noises followed by headache[7]. TMJ noises are not the consistent problem or disorder but are relatively a risk factor[7]. TMJ clicking without pain or significant dysfunction usually occurs due to alteration in disc displacement, variation in condyle morphology and mechanical disk derangements[8].

There is sufficient literature available worldwide which exhibited the association between stress and anxiety and TMDs and multiple studies indicated that depression, stress and anxiety are the predisposing factors and risk factors for TMDs and may aggravates the symptoms of TMDs[1, 9]. In 2008, according to the study conducted in Japan revealed the greater prevalence of TMDs was observed in working people and was around 17-18% and among general population the prevalence of TMDs was 5%-12%. It was inferred from the study that this huge difference was caused by the stress due to working climate, work load and interpersonal relationships which acted as an aggravating psychological factors[10]. Moreover psychological status have been correlated to the TMDs in multiple studies[1]. One comparative study of TMD sufferers and without TMDs reported augmented levels of somatization due to anxiety and depression[1].

There are ample epidemiological studies conducted worldwide which revealed the high prevalence of TMJ sounds among the age group of 15 and 25 years old[1]. The range reported for the prevalence of TMDs in various investigations has been 1%-75% of general population exhibiting at least 1 objective TMD sign, and 5%-33% reporting subjective symptoms[1]. One of the studies conducted in New Zealand in 2015 revealed 12% incidence of TMJ clicking as a self reported symptom and primary clinical finding[11]. This can be attributed to differences in race, sampling design, and diagnostic tools[1].

There are multiple medical and dental factors related to TMDs were highlighted in literature for example age, gender, emotional stress, psychosocial and genetic factors, disc anatomy and pathophysiology of muscles, occlusion, dental treatments (restorative, prosthetics, orthodontic), parafunctional and oral habits, posture and trauma[1,4].

Abundant literature revealed dental factors such as interference in normal occlusion like open bite, cross bite, crowding, missing teeth, midline discrepancies excessive overbite and overjet as perpetuating, triggering or predisposing factors for TMDs[11]. Parafunctional activities are usually harmless, until the forces exerted exceed the structural tolerance[1]. TMJ space reduction, followed by disc compression results in pain in muscles of mastication and discomfort and these symptoms are reported among the patients with chronic habit of clenching and bruxism[8].

According to Goran Agerberg et al; TMJ clicking was found to be most frequent clinical finding[12] while, Virginia Tuerling et al reported muscle tenderness was the most frequent complain among 80.9% of patients[13]. In 2002 according to Johansson et al discomfort in mastication was found in 61% of patients, pain during mouth opening among 19.4% patients , jaw joint noises in 28.5% of patients in a cross sectional study of (n= 8,888) subjects[14]. According to Michelotti et al jaw joint noises were the most occurring symptoms of TMDs followed by pain[11].

Fariha Shah in 2014 conducted a study in Shadman Lahore Pakistan which revealed pain while yawning and eating was most frequent complains followed by TMJ sounds of clicking and crepitus[15]. Another study conducted in Mardan, Pakistan evidenced clicking as a commonest symptom of TMDS among college students[16].

It was hypothesized that TMDs were more prevalent among female gender and TMJ clicking is the most frequently occurring sound. There is ample literature available worldwide and more work should be done nationwide to develop a strong Pakistani reference material to compare it with other studies and indeed it was the rational of the study. The objective was to determine the prevalence of TMDs among the sample of Karachi and to observe the most frequent TMJ sound in this population.

Methodology: This was a cross sectional study to determine the prevalence of TMDs among the sample from Karachi. The sample size was calculated as 289 based on the prevalence of 25% which then augmented to 300 by using sample size calculation formula N= (Z) 2 x P (1-P)/ d2[1]. Three hundred participants were inducted through cluster sampling technique from Karachi. Karachi is the metropolitan city and has the federation of eighteen autonomous towns and every town was sampled as cluster[17]. Approximately 17 participants were selected from every town and though this sample was the true representative of Karachi population. The data was collected from Sep to Nov 2017 in the oral medicines OPD of all the clusters. The data was collected by the help of self administered questionnaire and intraoral examination was conducted by researchers and was formulated with the help of Research Diagnostic Criteria for TMD (RDC/TMD)[1, 18]. The questionnaire was validated after conduction of pilot study on 30 participants. The rational of the study was explained to every participant before the informed consent. The study protocol was approved by the Ethical Review Committee of BUMDC numbered 37/17. All those patients who were reported to Dental OPD between 20-75 years gave consent and had complain of any TMJ symptoms were included in the study. The subjects with atypical odontalgia, burning mouth syndrome, atypical facial pain, cervical and neuropathic pain, fibromyalgia, migraine, trigeminal neuralgia and with the history of treatment of TMDs were excluded from the study. The demographic variables were age, gender, dental history (filled/missing teeth, removable/fixed prosthesis), symptoms of TMDs were assessed by asking questions regarding pain during mastication and mouth opening, pain on neck/cervical area, MPDs tenderness, headache, earache. TMJ sounds clicking/crepitation, parafunctional habits i.e: clenching, tooth grinding. Risk factors of TMDs for example TMJ pain aggravates under stress, nervousness, history of head and neck trauma were asked.

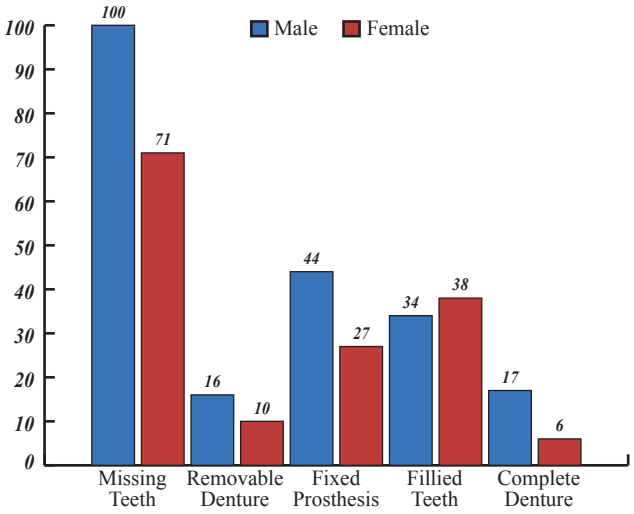
Oral examination: The clinical examination of TMJ was conducted via the help of questionnaire i.e; inspection,

palpation, and an intraoral examination. The localized tense and painful area was examined. The suprahyoid, subhyoid head and neck muscles and muscles of mastication were examined. The origin and insertion of massater muscle was palpated at zygomatic arch and angle of the mandible. Mouth opening was measured with the help of ruler between the central incisor and TMJ sounds were assessed as clicking, crepitation or no sound with the help of stethoscope. To assess the articulation, mandible deviation and dental status of patient about missing teeth, filled teeth, presence of removable or fixed prosthesis or presence of complete denture intraoral examination was performed.

Statistical Analysis:

The data was entered manually on SPSS version 23 for data analysis. To compare prevalence of clicking with gender descriptive analysis and chi square (x^2) was applied. Confidence interval was set at 95% and P value less than 0.05 was taken as statistically significant.

Results: Our study focused on 300 participants who fulfilled the inclusion criteria and were recruited through cluster sampling technique. There were (n=162, 54%) males and (n=138, 46%) females in this study. Majority of participants fall under the age group of 20-30 years of age. During assessing the association between gender and TMDs symptoms; pain during mastication (n=104, 64%), was the most common symptom in male followed by pain on neck/cervical area which was (n=93, 57%) and MPDS tenderness was (n=73, 45%) and most common symptoms in female was pain on neck/cervical area which was (n=92, 66%) followed by pain during mastication and MPDs tenderness which was (n=78, 56%). Pain during mouth opening was slightly greater (n=36, 22%) in male and then female (n=29, 21%) and p-value was 0.063. Headache and earache was the least common symptom among both genders. Headache was (n=10, 6.1%) in male and (n=23, 16.6%) in female and p-value was 0.003. Earache was (n=12, 7.4%) in males and (n=21, 15.2%) in females and p-value was 0.024.Table-1. For assessing the association between gender and TMJ sounds; clicking was the most common sound found among both genders, in male it was (n=58, 35.8%) and in female it was (n=48, 34.7%) and p-value was 0.475 followed by crepitation which was (n=8, 4.9%) in male and (n=12, 8.6%) in female and calculated p-value was 0.143. Regarding parafunctional habits majority of females (n=95, 68.8%) were in habit of clenching than male (n=60, 37%) and p-value was 0.0001 followed by tooth grinding which was also found in majority of female (n=64, 46.3%) then male (n=10, 6.1%) and p-value was 0.0001 Table-2. Stress was found to be most common risk factor and aggravating factor of TMDs among both genders. From the total (n=73, 45%) male and (n=78, 56.5%) female responded affirmatively that TMJ pain aggravates during stress and statistically significant difference found between both genders and p-value was 0.0001on the other hand (n=12, 7.4%) male and (n=21, 15.2%) female were found to be nervous, p-value was 0.0001. Upon examination, majority of females were found with disturbed articulation, (n= 37, 26.8%) and in male it was (n=10, 6.1%), and calculated p-value was 0.0001. Deviated mandible was found slightly more in males (n=14, 8.6%) and in female it was (n=13, 9.4%) and p-value was 0.485. From the total females (n=11, 7.9%) had the history of head and neck trauma than male which was (n=8, 4.9%), (n=8, 5.7%) female and (n=7, 4.3%) male encountered TMJ locking during their life-(Table-3). Regarding dental status; missing teeth were found in both gender; (n=100, 61.7%) male and (n=71, 51.4%) female and calculated p-value was 0.047. In male (n=44, 27%) had fixed prosthesis, (n=34, 20.9%) had filled teeth, (n=17, 10.4%) were wearing complete denture and (n=16, 9.8%) had removable partial denture. In female (n=38, 27.5%) had filled teeth, (n=27, 19.5%) had fixed prosthesis, (n=10, 7.2%) had removable partial denture and (n=6, 4.3%) were wearing complete denture. When comparing the gender, male was having more number of missing teeth, removable denture, fixed prosthesis and complete denture then female and greater number of filled teeth was seen in female gender then male. Graph-1. Explicit analyses of this study accept the research hypothesis.



Graph: 1 Dental Status and Gender

Discussion: Multiple clinical symptoms related to the TMDs were assessed in several studies for example parafunctional habits, TMJ clicking, jaw locking, history of trauma to head and neck and dental status like missing teeth[19]. However, it is difficult to classify TMDs according to greater number of symptoms and the variations found in a single patient. There were ample retrospective clinical studies examined the association between TMDs and risk factors. Age, gender, psychological factors were associated with TMDs according to the systemic review based on clinical studies. The effect of oral parafunctional habits on TMDs were studied by Michelotti *et al* and revealed that

TMDs Symptoms	Gender		P-value
	Male(n=162)	Female(n=138)	
Pain during mastication	104	78	0.108
	64%	56.5%	
Pain during mouth opening	36	29	0.456
	22%	21%	
Pain on neck/cervical area	93	92	0.063
	57%	66%	
MPDs Tenderness	73	78	0.031*
	45%	56.5%	
Headache	10	23	0.003*
	6.1%	16.6%	
Earache	12	21	0.024*
	7.4%	15.2%	

Table-1: Association between Gender and TMDs Symptoms

TMJ Sounds	Gender		P-value
	Male(n=162)	Female(n=138)	
Clicking	58	48	0.475
	35.8%	34.7%	
Crepitation	8	12	0.143
	4.9%	8.6%	
Clenching	60	95	0.0001*
	37%	68.8%	
Tooth Grinding	10	64	0.0001*
	6.1%	46.3%	

Table-2: Association between Gender and TMJ sounds and Parafunctional habits

TMDs Symptoms	Gender		P-value
	Male(n=162)	Female(n=138)	
TMJ pain aggravates under stress	73	78	0.0001*
	45%	56.5%	
Nervousness	12	21	0.0001*
	7.4%	15.2%	
Disturbed articulation	10	37	0.0001*
	6.1%	26.8%	
Deviated mandible	14	13	0.485
	8.6%	9.4%	
H/O head and neck trauma	8	11	0.201
	4.9%	7.9%	
TMJ locking	7	8	0.373*
	4.3%	5.7%	

Table-3: Impact of Risk factors of TMDs on Gender

diurnal parafunctional activities, especially daytime tooth clenching/grinding, were risk factors for subgroups of TMDs and myofacial pain[20]. According to Lee et al; jaw disability was the risk factor among 87 psychological distress patients[21]. Hagag et al discovered that prosthodontic treatment and occlusion has an impact on TMDs[22] while Mohlin et al examined that orthodontic treatment and malocclusion has no association with TMDs[23].

The primary aim of this study was to study the prevalence of TMDs symptoms associated with gender among the population of Karachi. Multiple epidemiological studies reported severity and high frequency of TMDs were found in females as compare to males[20]. These differences were well explained due to hormonal, psychosocial, behavioral and constitutional factors without any significant result according to multiple studies[1, 23]. In our study, females were found to have a higher prevalence of TMDs symptoms than males and these results were parallel with observations of Manfredini *et al*. on 433 patients[24]. Pain in temporo-mandibular joint is the only reason to visit the dentists by the sufferers of TMDs. According to our study tool; questions related to pain during mastication, pain during mouth opening, pain on neck/cervical area, pain in MPDs, frequent earaches and headaches were asked. In our study, pain during mastication, pain in neck/cervical area and in MPDs were observed mostly among females and similar trends were observed in another study[5] and these results were in harmony with the study of Begis which revealed that pain in resting position at TMJ area and in masseter muscle was significantly higher in female gender[19]. According to Velly *et al* females were three times more at the risk of MPDs in 83 patients[25]. In our study, majority of females were the sufferers of headache and earache and significance difference was found between both genders and these results were compatible with the study of Bora.[19] and Cooper et al who investigated TMDs among 4528 patients and discovered that around 96.1% subjects reported pain in temporal region which followed by headache in 87% of participants.[26]

Symptoms of TMDs include jaw joint noises for example TMJ clicking, crepitation.[7] In our study the prevalence of clicking was 35% and mostly reported by males and crepitation was 6% which was mostly reported by females and no statistical significance were noticed among both gender and these results were almost in agreement with the study of Bora in which 39% patients reported with clicking and 6% with crepitation with significantly different results among both gender which found nearly four times more frequent among females then males[19]. and Troeltzsch *et al*. reported the opposite results then our study , in 1031 patients ; they observed more clicking among female patients[27]. Another study reported 40% clicking and 15% crepitation[28]. Important etiological factors of TMDs include bruxism, clenching and grinding as a parafunctional habits[25]. During bruxism, the habit of grinding and pressing the teeth alters the biomechanical mechanism of TMJ by overloading the articular surfaces[29]. In our study, most frequent parafuctional habits were clenching and grinding which were frequently observed in female patients and these results were compatible with the study of Bora Begis[19]. Among the risk factors disturbed articulation, deviated mandible, TMJ locking , history of head and neck were the infrequent findings and mostly found in females in our study.

Multiple studies conducted worldwide which exhibited the strong association between TMDs and anxiety and depression. The patients with TMDs demonstrated greater frequency of stress, anxiety, somatization and depression[1,30]. Our study demonstrated nervousness and stress as an aggravating factor in temporomandibular pain and mostly found in females and significant difference was found among both genders and these results were comparable with the study of Ali KFM[1] Furthermore, the female gender has been ascertained a predisposing factor in the establishment of TMDs due to the higher hormonal fluctuations, estrogen levels, biological differences, social status and low threshold of pain perception[1, 12-14].

Ample literature evidenced the dental status for example malocclusion and missing teeth as predisposing factors to TMDs[31, 32] however the role of occlusion related factors is controversial as they are weakly associated with TMDs[21]. In our study missing teeth was more frequently observed in both gender but impact of missing teeth on TMDs should be verified on a larger sample size.

Strengths and limitations of the study:

Non standardized examination procedure was one of the limitations of the study. The second limitation was the smaller sample size. The third limitation was another variable like ethnicity and age related variable should be included in the study tool. The cluster sampling technique and the study tool which was formulated with the help of validated questionnaire based on the Research Diagnostic Criteria for TMD (RDC/TMD) [36] were the strengths of our study.

Conclusion:

It was inferred from this study that greater prevalence of TMDs was mostly found in female gender. The statistically significant difference was found among stress as an aggravating factor of TMDs and gender. Pain during mastication, pain on neck/cervical area and MPDs tenderness were the most common symptoms among both gender. Statistically significance difference was found among both gender while assessing headache and earache. Clicking was the most prevalent TMJ sound and clenching was the most frequently observed parafunctional habit among both gender, followed by tooth grinding and statistically significant difference found among both gender. Stress was found as an aggravating factor, nervousness and disturbed articulation were the significant risk factors among both genders.

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Original Article

Circumcision in patients with bleeding disorders: Can it be done safely?

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ABSTRACT

Purpose: The purpose of our study was to review outcome of circumcision among children with bleeding disorders at our institution and also to determine the impact of optimization leading to safe circumcision.

Methods: Data representing boys (age 0-16 years) who underwent routine circumcision at the Aga Khan University Hospital (AKUH) between1988-2014 was retrospectively reviewed. Children with bleeding disorder were identified using International Classification of Diseases (ICD) Code 64.0. Data was retrieved and confidentially was maintained. SPSS version 19 was used for statistical analysis.

Results: During 26 years 13,200 circumcisions were performed at AKUH. Amongst these 8,463 (64.11%) were done by using Plastibell, while 4,737 (35.88%) by open slit method. Only 23 (0.17%) children were identified with bleeding disorder. Two groups were made, Group-A (n:15) children with known bleeding disorders having circumcision and Group-B, (n:8) those in whom bleeding disorder was diagnosed after circumcision.

Median age of children in Group-A was 9 years. All children in Group-A underwent open circumcision. 10 patients had Factor VIII deficiency, 2 had Glanzmann's thrombasthenia, 1 had Factor IX deficiency, 1 had Quebec platelet disorder, and 1 had Von Willebrand disorder.

Median age of children in Group-B was 3 months. 7 out of 8 underwent plastibell while one had circumcision by open technique. 7 were diagnosed as Factor VIII deficiency and 1 diagnosed later to have Glanzmann's thrombasthenia. Statistical analysis showed significant difference among these two groups' p-value with respect to age (p-value 0.00) and family history (p-value 0.04- Fisher's exact test). Both groups had similar postoperative length of stay. Overall bleeding complication rate after optimization was 13.33%.

Conclusion: With the help of hematologist and adequate Factor replacement, these children can be managed as daycare. We suggest risks and benefit should be discussed with parents before procedure.

Key words: Bleeding, circumcision, hemophiliacs

INTRODUCTION:

Circumcision is one of the oldest surgical procedures with the origin dating back to ancient times[1]. In some societies i.e. Muslims and Jews, circumcision is entirely a religious rite, whereas in others it may be a cultural and traditional practice[2]. However, in some societies in Africa it is a local cultural practice. According to WHO, 30% of males are circumcised, majority being Muslims. Its prevalence has risen from 48% to 61% during the years 1988 to 1991[3]. Age at circumcision shows differences between societies. Jews as a continuation of God's covenant, circumcise boys 8 days after birth, whereas usually muslim males are circumcised before puberty[4]. It is one of the commonly performed surgical procedures in pediatric surgery practice in our country due to religious reason.

Bleeding is the most common early complication after circumcision followed by infection[5]. The complication rate depends on multiple factor including anatomic variations and surgical technique used. Mostly bleeding occurs along skin edges or from discrete blood vessels, surrounding frenular area[6]. Reported incidence of bleeding after circumcision in normal individuals is reported to be 0.1-35%. However, post circumcision bleeding in children with bleeding disorder is higher which varies between 23-56%[7]. As majority of circumcisions are performed in neonatal period, excessive post circumcision bleeding is often the first sign of congenital bleeding disorder as reported by Shahida et al to be nearly 62%[8]. This higher incidence of bleeding in such children can lead to catastrophic bleeding events. However limited data is available about management of these children.

In developing countries where routine screening is not done, many individual are diagnosed with bleeding disorder following circumcision. In Pakistan, 90-95% circumcisions are performed by village barbers or paramedical staff. And rest being performed within a proper medical setup[9]. Due to paucity of local literature on this subject, this study was conducted too review our experience of dealing with these

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situations.

MATERIALS AND METHODS:

This was a retrospective chart review. The study was conducted at the section of pediatric surgery, The Aga Khan University Hospital Karachi, Pakistan. We reviewed files of all children with bleeding disorders who underwent circumcision from April 1988 till May 2014. ICD code 64.0 (procedure code), 99.06, 155.0, 286.0, 286.3, 286.9, 287.1, 287.5, 570, 571.5 was used to identify patients. Children were divided into two groups, Group-A included children with known bleeding disorders prior to circumcision and Group-B included those in whom bleeding disorder was diagnosed after performing surgery, Figure 1. Data including patient's demographics, type of bleeding disorder, reason for circumcision, Bleeding disorder status whether known before or after the procedure, pre and postoperative strategies used for homeostasis and length of hospital stay. Data was collected in coded form on a specifically designed questionnaire. All the possible efforts were made to prevent patient disclosure. Data was entered and analyzed using SPSS version 19.

RESULTS:

A total of 13220 children were circumcised during the study period. Plastibell technique was used in 8,463 (64.11%) (Mabis Healthcare USA/ Hollister) followed by open method 4,737 (35.88%). Total 26 children developed bleeding after circumcision. However, the record of 3 children were incomplete, therefore 23 were included in our study (Figure 1). We divided the children into two groups. Group A; with known bleeding disorders prior to surgery included 15 children and Group B; diagnosed later with bleeding disorder had 8 children. The surgery was done as an elective procedure for all children. The indication for circumcision was religious grounds in all of the cases. In majority of patients, procedure time was observed to be 15-30min (39%) followed by 30-60 minutes (34%). However in 2 children procedure time was more than one hours. Sutures and bipolar diathermy were used to secure homeostasis in 21 out of 23 children

In Group A, 7 children underwent procedure under penile block, while 6 underwent procedure under general anesthesia. All had circumcision by open method. Majority of the children (73%) were hemophiliacs. Two children were found to have Glanzmann's thrombasthenia. One child had Quebec syndrome and another had Von Willebrand disease.

Preoperative optimization of the children was done according to the nature of the bleeding disorder. Guidelines of world federation of hemophiliac for developing country were followed including pre-operative levels of factor (40-80 IU/DL), factors transfused1-2 hours before surgery, post-operative levels between 20-50 IU/DL for 1-5 days transfusion(10). Since the majority of children were hemophiliacs, therefore factor levels were optimized before and after the procedure in accordance with these guidelines in collaboration with hematologist. Those with platelet deficiencies were transfused platelets. The same strategy was used for postoperative optimization i.e. based on the nature of the bleeding disorder, as given in Table 1.

Three children had post-operative complications in Group-A. One patient developed hematoma on day 15. Other had postoperative bleeding on day 12, while third had bleeding on day 9. This child was initially diagnosed as Factor XIII deficiency but the bleeding did not stop despite adequate factor replacement. Later he was found to have Glanzmann's thrombasthenia, Table 1.

In Group-B, 3 children were operated at our institute, while 5 children were referred to us after having had procedure from some other facility. All of them were hemophiliacs with Factor VIII deficiency as shown in Figure 2. 7 out of 8 underwent plastibell circumcision. Postoperatively these children received plasma and plasma products as they had no prior diagnosis of congenital bleeding disorder, Table 1.

DISCUSSION:

Male circumcision is one of the oldest surgical operation known, its history dates to ancient times (15000 BC)[11]. Worldwide prevalence is 20-30%. It is ritual among Jews and Muslims. Complication rates vary from 1-15%. It's most common complications is bleeding, rate varies from 0.1-35%[12]. Risk associated in children with bleeding disorder is even greater and if proper measures are not taken it can be life threatening[13]. In our country because of religious obligation parents wish to have their child get circumcised despite a known bleeding disorder[14].

In countries, where circum is not a traditional practice, the main reason for the procedure is a medical indication, they include lower rate of urinary tract infection seen only in infancy, 10 times higher in uncircumcised boys, 3 times of higher risk of penile cancer, and the risk of cervical cancer in partners of circumcised males is low[15,16]. Patient on clean intermittent also gets benefit from circumcision[17].

Bleeding disorders can be categorized into three groups: disorders of platelet function or number, disorders of clotting factors, and a combination of these. Initial laboratory investigations should include a complete blood count (CBC), prothrombin time (PT), activated partial thromboplastin time (APTT), platelet function screening and peripheral film examination should be done in patient with positive family history of bleeding diathesis[18]. A preoperative screen for a patient with a negative history and examination should include a CBC, PT, and APTT only.

Clotting factor disorder whether acquired or inherited can result in bleeding disorders[19]. Hemophilia is the most commonly the X-linked recessive diseases characterized by deficiency either of factor VIII (hemophilia A) or factor IX (hemophilia B, or Christmas disease). The incidence is 1 per 5000 live births with no racial tendency[20]. The diagnosis is suggested by an elevated APTT level in a male patient

Variables	Group A (N = 15) known diseased	Group B (N = 08) not diagnosed	P - Value
Median age	9 years	3 months	0.001
Preoperative optimization • Cryoprecipitate • Clotting factors • Platelets • Factors + cryoprecipitate	15 (100%) 03 08 03 01	0	
Surgical techniques • Open method • Plastibell	15 (100%) 0 (0%)	01 (12.5%) 07 (87.5%)	
Postoperative optimization • Factor 8 • Cryoprecipitate • Factor 9 • Cryoprecipitate + FFP • platelets	15 (100%) 06 04 01 01 03	0	
Postoperative complications	03 (20%)	0	
Postoperative Bleeding	02 (13%)	0	0.00
Family history	07 (46.66%)	0 (0%)	0.04
Length of hospital stay	05 days	05 days	0.5

Table 1: Comparative analysis of two Groups

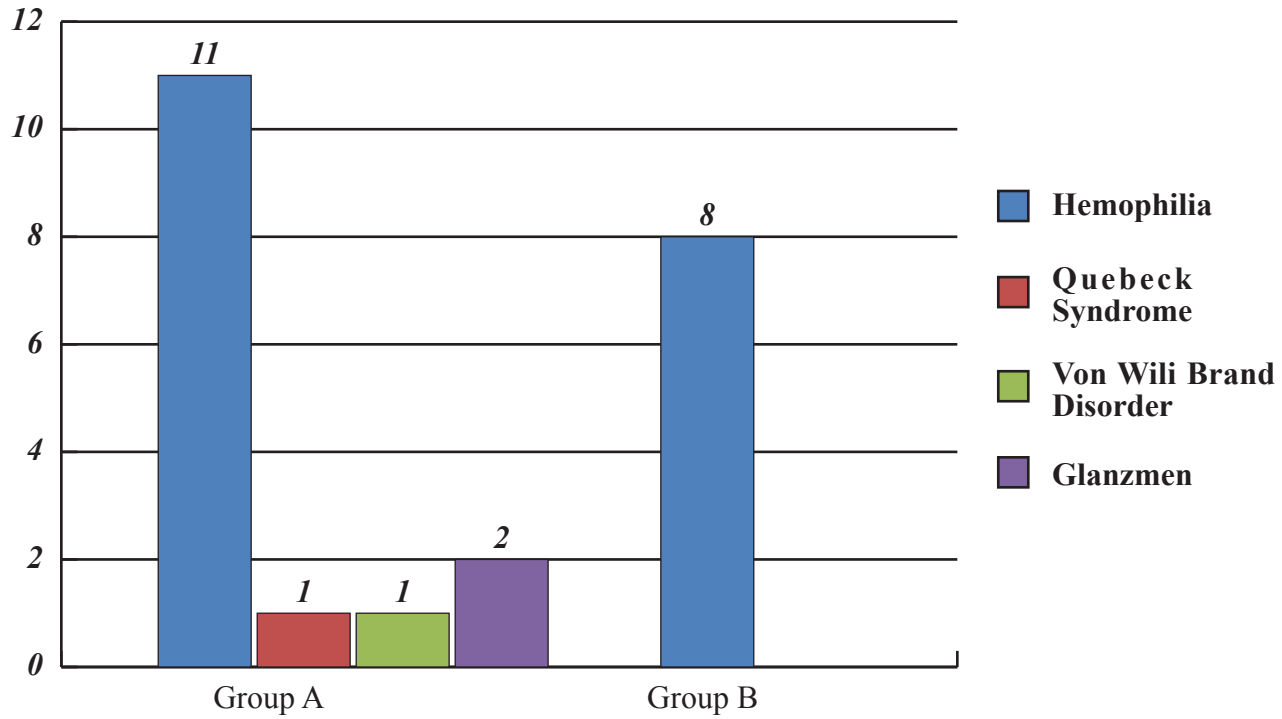

Figure 2: Diagnosis in two groups

with a positive family history. Factors VIII and IX levels are decreased in hemophilia's A and B, respectively[21].

Most surgical and invasive procedures can be performed safely in children with bleeding disorder with factor replacement therapy[22]. Appropriate pre-operative optimization of patient with factor replacement can decrease pre, peri- and post-operative bleeding complications. Replacement therapy is required for children undergoing circumcision. A target level of 80% and maintenance of replacement therapy during 3–4 days are recommended. Adjunctive treatment with antifibrinolytics and/or fibrin glue should be considered[23].

In Group-A preoperative and postoperative optimization was done specifically according to nature of disease. We have used Factor VIII in 8 children, cryoprecipitate in 3 children, cryoprecipitate and Factor IX in single child, platelets in 3 children. Whereas, postoperative optimization was done using Factor VIII in 6 children, cryoprecipitate in 4 children, cryoprecipitate and Factor IX in 1 children, cryoprecipitate and FFPs in one child and platelets in 3 children. However, no pre operative optimization done in Group-B as we were unaware of their diagnosis. All children in Group B received cryoprecipitate and FFPs postoperatively, Table 1. These are the patients had bleeding disorder but it was not diagnosed unless had circumcision and was diagnosed after circumcision. In our health care system it is possible as most of children had no access to screening or mostly because parents are not aware of other symptoms like bruising or unexplained bleeding.

A study conducted in Iran had a very large sample size of 424 children with previously diagnosed bleeding disorder and that of a US study had a sample size of 21 children. In comparison to these studies, our study had 15 children with previously known bleeding disorders. More than ¾ of the children in our study were hemophiliacs. All our previously diagnosed children were preoperatively optimized before the procedure, whereas in the US study 57% and in the Iranian study 35% children were preoperatively optimized[24,25]. We have found the lowest rate of bleeding complication in our study. On comparison, the children with previously known bleeding disorder were found to have slightly higher risk of bleeding 20%. The reason could be attributed to the fact that two children were circumcised before factors were available for optimization, while in third case diagnosis was delayed.

This study is an eye opener for us as ritual circumcision is a norm in our socially and because of lots of social and religious obligations parents are more the willing to proceed for circumcision. Unfortunately most of our children don't have an access to better screening due to poor socio-economic conditions. Although this procedure apparently seems a simple procedure but this can be a high risk procedure especially for this cohort of patient who hasn't been screened before or even if known to us due to various bleeding disorders. We believe without adequate optimization it can lead serious complications which are impossible to manage outside tertiary care setting.

Circumcision can be done safely in children with bleeding disorders but with prior adequate optimization and timely prep consultation with hematologist in management decreases the incidence of postoperative bleeding and circumcision may be done as a daycare procedure[26].

CONCLUSION:

The complication rates were found to be similar in children with and without bleeding disorder. With prior optimisation which we have mentioned above complications rates are similar between these high risk group and normal children.

Circumcision can be done safely in children with bleeding disorders but with prior adequate optimization. Although procedure appears to be simple, but without adequate optimization it can lead serious complications which are impossible to manage outside tertiary care setting.

The involvement of hematologist in management decreases the incidence of postoperative bleeding and circumcision may be done as a daycare procedure.

Conflict of interest:

There is no conflict of interest in our study

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Original Article

Frequency Of Oral Findings With Reference To Diabetes Mellitus Patients: A Multi-center Cross-sectional Study

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ABSTRACT:

Objective: Oral pathological findings are often associated with diabetes mellitus. The aim of the study was to assess the frequency of oral findings among diabetic patients of both genders.

Materials and Methods: A cross-sectional observational study was conducted from February 2017 to November 2017 at Bahria University Dental Hospital & Mamji Hospital, Karachi. A total of 363 diagnosed patients of diabetes mellitus were selected for the study. A questionnaire was designed and oral clinical examination was performed. The collected data was analyzed by using SPSS version 23.

Results: A total number of 363 diagnosed patients of diabetes mellitus were included in the study. Among these 187 (51.52%) were male and 176 (48.48%) were female. The overall oral mucosal findings were predominantly present in male diabetic patients as compared to females.

Conclusion: The result of this study showed a high prevalence of oral pathological findings in diabetic patients.

Keywords: Dentistry, Diabetes mellitus, Oral mucosa, Lesions

INTRODUCTION:

Diabetes Mellitus (DM) is an endocrine disorder which is highly prevalent around the globe[1]. First reported case of DM was found in an Egyptian manuscript dated around three millenniums ago[2]. In the contemporary times, it has become a major public health concern and a leading cause of morbidity and mortality[3]. This metabolic syndrome is mediated by numerous factors resulting from deficiency of insulin, which may be absolute due to pancreatic beta-cell destruction (Type 1) or relative due to an increased resistance of the tissues to insulin (Type 2)[4,5].

The etiology of DM is multifactorial in origin. Environmental factors like obesity, sedentary lifestyle and diet are the main causes. Other socioeconomic factors such as rising living standards, steady urban migration, and lifestyle changes are possible factors for development of DM[6,7,8].

The prevalence of DM varies from country to country. The demographical studies have shown that the prevalence of DM in Pakistan is high, ranging from 7.6% to 11%[1].

In patients of DM various alterations had been observed in the oral cavity, including inflammatory conditions such as gingivitis and periodontitis. Salivary dysfunction, altered taste and burning mouth are also seen. Oral mucosal lesions were also reported in DM patients in the form of stomatitis, geographic tongue (GT), benign migratory glossitis (BMG), fissured tongue (FT), traumatic ulcers, lichen planus, lichenoid reaction and angular cheilitis[7,8]. Furthermore, dental caries, tooth loss and delayed mucosal healing have been also found in patients[8,9,10].

The aim of this study was to determine the frequency and types of oral mucosal findings and investigating the possible association with DM.

MATERIALS AND METHODS:

The present cross-sectional study was carried in patients, who visited Dental OPD at Bahria University Dental Hospital (BUDH) and Mamji Hospital, Karachi. The study lasted for the period of 10 months from February 2017 and November 2017. A total of 363 diagnosed patients of diabetes mellitus of both genders were examined. The patients, who were non-diabetic, medically handicapped and those unwilling to give consent, were excluded from the study.

The patient's data including gender, chief complaint, social habits and type of oral finding were recorded on proforma. The data was statistically analyzed by Statistical Package

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for the Social Sciences (SPSS) version 23 to find out the significance of variables.

RESULTS:

A total number of 363 diagnosed patients of DM were included in the study. Among these 187 (51.52%) were male and 176 (48.48%) were females.

In present study, with respect to gender, higher frequency of linea alba, that is 34.76%(65), was also seen in males. It was followed by fissured tongue and racial pigmentation of gums with 31 (16.58%) and 17(9.09%) cases respectively. Similarly, in females the linea alba 24.43% was dominant while fordyce granules 14.77% and fissured tongue 14.20% came after in descending order. (Table: 1)

DISCUSSION:

DM is a disease spreading rapidly across the globe[11,12]. The middle and low-income countries show increased incidence of the disease above 60 years of age group[13,14]. According to the statistics of the International Diabetes Federation (IDF), Pakistan stands on number seventh position in global standings[15,16]. This concerning situation poses a grave challenge for health care professionals in the country[17,18].

The present data findings has identified a high prevalence of oral mucosal findings among DM patients. Earlier study documented the prevalence of oral mucosal lesions among diabetes patients that was about 80%[19]. Similar studies conducted in Brazil and Malaysia showed high prevalence of oral lesions in diabetics than controls[20].

Linea alba are white lines that occur most commonly on the buccal mucosa either due to pressure, friction, sucking or trauma. It had the highest number of cases in our subjects[21]. Mirza et al recorded 76 cases of linea alba among non-

Oral Findings	Male	Female	Total
Racial pigmentation	17 (9.09%)	5 (2.84%)	12(3.30%)
Frictional Keratosis	4 (2.14%)	2 (1.12%)	6 (1.65%)
Angular cheilitis	13 (6.95%)	22 (12.5%)	35 (9.64%)
Denture stomatitis	3 (1.60%)	6 (3.41%)	9 (2.48%)
Apthous ulcer	7 (3.74%)	7 (3.98%)	24 (6.61%)
Leukoplakia	3 (1.60%)	0 (0%)	3 (0.83%)
Traumatic Ulcer	12 (6.42%)	19 (10.79%)	31 (8.54%)
Candidiasis	2 (1.46%)	0 (0%)	2 (0.55%)
Linea Alba	65 (34.76%)	43 (24.43%)	108 (29.75%)
Oral Lichen planus	4 (2.14%)	4 (2.27%)	8 (2.20%)
Tongue tie	1 (0.53%)	4 (2.27%)	5 (1.38%)
Median Rhomboid Glossitis	3 (1.60%)	5 (2.84%)	8 (2.20%)
Fissured tongue	31 (16.58%)	25 (14.20%)	56(15.43%)
Hairy Tongue	2 (1.46%)	5 (2.84%)	7 (1.93%)
Geographic tongue	4 (2.14%)	3 (1.70%)	7 (1.93%)
Fordyce granule	16 (8.56%)	26 (14.77%)	42 (11.57%)
Total	187 (51.52%)	176 (48.48%)	363

Table 1: Table showing oral lesion findings with respect to gender and frequency

diabetic patients in the same setting[22].

The second most common category of oral findings was fissured tongue (FT) in both genders but, with male predominance. However, Jahanbani et al. conducted a study in Tehran which showed higher frequency of FT in females than males[23]. In 2016, a domestic study conducted by Mohsin and colleagues documented a total of 15.9% of FT in total of 225 cases in Karachi. The frequency coincides with our study which shows 15.43% of FT in 363 subjects[24].

Fordyce granules was the third most common finding in present study. However, study conducted by Mirza in 2017 showed the highest prevalence of fordyce granules among the DM patients[25].

CONCLUSION:

DM is a chronic insidious disease that may later result in neuropathy, nephropathy and retinopathy etc. Furthermore, oral mucosa is adversely affected. It can be deduced that in addition to the systemic complications, the dentists should monitor the oral health of DM patients, since a high incidence of oral mucosal alterations indicates a need for urgent treatment. The study also emphasizes on regular clinical examinations to ensure early diagnosis and prompt tackling of adverse oral findings in DM patients.

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Review Article

Copper and Human Health- A Review

Nasim Karim

ABSTRACT:

Copper (Cu), is an essential trace element. Along with lead, arsenic, mercury, cadmium etc. it is classified as a member of heavy metal group. Deficiency of copper is involved in the etiology and promotion of many disease processes related to gastrointestinal and neurological systems as well as affect functions of heart, blood vessel, pancreas etc. Deficiency of copper in early part of gestation can produce major organ malformations in the developing fetus and this in turn if persistently present can lead to neurological as well as immunological abnormalities in the newborn. Conversely presence of enormous concentrations of copper is also a great danger for the human health. Acute copper toxicity predisposes to various pathological conditions and can cause death in severe cases. Chronic exposure to copper produces anemia, liver toxicity and severe neurological defects.

Key words: Copper, Essential trace element, Heavy metal, Deficiency, Health hazards

INTRODUCTION:

Heavy metals like lead, arsenic, mercury, cadmium, copper etc. are environmental pollutants and are vastly used in industries. These metals have become a major cause of diseases in human beings[1]. The word Copper (Cu) has been derived from roman word "cyprium" probably because of the presence of a large number of copper mines in Cyprus. Copper is a red colored natural metal dispersed in the whole environment surrounding us. The crust around the earth has nearly fifty parts of copper per million parts of soil (ppm). It is an important and necessary metal for all living beings inclusive of plants, animals and mankind but only if consumed at lower levels. Toxic effects are liable to occur at high levels. Copper sulfate is the most commonly used form of copper compound. Copper is usually utilized as a metal but it`s alloys are also available for example brass and bronze etc. It is used in the manufacture of wires, metal sheets, pipes and other products of metals. In agriculture copper compounds are used to treat various plant diseases. They are also used for water treatment and as preservatives for wood, leather, fabrics etc[2].

Copper belongs to Group I-B of the periodic table. There are 04 different forms of copper , Cu (O), Cu (I), Cu (II), and Cu (III). Prolong exposure to copper can produce allergic rhinitis, lacrimation, photophobia and excessive salivation. Various central nervous system, gastrointestinal and renal problems can arise due to copper. Production of copper in industries produces fumes, dust particles and mists and can promote nasal mucosal atrophy. Prolong exposure to copper in high doses may cause Wilson's disease characterized by development of Kayser-fleischer ring due to corneal accumulation of copper.[3]

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The environment around us that is water, air, soil and even food may have heavy metal contaminants including that of copper. It is the contact of these agents with the human beings that is important[4]. Environmental pollutants enter human body through respiratory tract, skin contact and ingestion via mouth etc[5]. Humans are exposed to copper mainly by consumption of contaminated food and drinking water. Copper pipes can be an important source of water contamination. Agriculture lands near the industries and highways, foods rich in copper like seafood, mushroom, seeds, nuts, pulses, dried fruit, goat cheese, fermented soy foods are other sources of exposures[6].

METHODOLOGY:

Literature search was done utilizing search engines of Google and Google Scholar. Filter used are literature search duration 1997-2018, human studies, review article, original articles, guidelines. Key words and phrases used are copper trace element, heavy metal copper, pharmacokinetics of copper, pharmacodynamics of copper, biological effect of copper deficiency, health hazards of copper, analytical techniques for copper evaluation in humans. A total of 56 articles are selected for write up of this review.

LITERATURE REVIEW:

Copper (Cu), is an essential trace element. Along with lead arsenic, mercury, cadmium etc. it is classified as a member of heavy metal group. Deficiency of copper and conversely presence of excessive amounts in the body both situations are detrimental for human health. Acute toxicity of copper predisposes to various pathological conditions and can cause death in severe cases. Chronic exposure to copper produces hepatotoxicity and neurological problems. Most of the copper compounds vividly bind to dust particles or they may be embedded in mineral component of rocks and soil. Copper gains entrance into the human body through drinking water or through respiratory tract upon inhaling dust particles that contains copper. Copper can also affect human beings in an indirect manner by dissolving in water. This soluble form of copper in water may be used in cultivation of plants or

for rearing cattle and other animals and is really threatening our health. Upon release into lakes and rivers soluble copper compounds becomes attached to particles in water, approximately in one day and remain suspended for prolonged periods of time. The concentration of copper in air ranges from a few nanograms in a cubic meter of air (ng/m³) to about 200 ng/m³. This concentration may reach upto 5,000 ng/m³ in the vicinity of copper smelter industries. People residing or working near mines of copper or industries that use copper metal are exposed to increased amounts of copper in the form of copper dust. The average concentration of copper in tap water ranges from 20 to 75 ppb. However, many households have copper concentrations of over 1,000 ppb. When water sits in the pipes overnight the copper present in pipes dissolves in water and thus makes this drinking water polluted for use. We can reduce the concentration of copper by letting water flow for about fifteen to thirty seconds from the tap before using it for any purpose. Copper concentration in lake water and river water varies from 0.5 to 1,000. Copper present in gardening products for treating diseases in plants is still another source of predisposition for humans. They may come in contact with skin and may be swallowed accidentally. Soil generally contains 2 to 250 ppm copper however up to 17,000 ppm have been found near copper and brass industries. Copper dust and waste from copper smelters, grinding, welding and mining industries as well as sludge from sewage treatment plants accounts for high concentrations of copper in the soil around the industrial areas thereby affecting people living in the locality. Workers in these industries are exposed to copper by either inhaling dust contaminated with copper or by absorption of copper from epidermal layer of skin. Air borne exposure to copper at workplace must be regulated to reduce harmful effects to humans[7].

Pharmacokinetics of Copper

Absorption of copper occurs from stomach and upper intestine. It varies from 15–97% and depends upon the component of copper present in the consumed dietary amount[8]. Zinc and cadmium inhibit absorption of copper presumably by competitively affecting the transport of copper or by increasing the level of metallothionein in the intestines. Conversely bioavailability of copper is reduced by fructose and other carbohydrates, dietary cellulose fiber and phytates[9]. Copper binds to albumin, glutathione, and amino acids in the portal blood after being released from intestinal cells into the serosal capillaries. In the liver, copper is either incorporated into copper dependent proteins or is excreted into the bile[10]. Liver regulates copper release and maintains homeostatic control on the extrahepatic distribution of copper[11,12]. More than 95% of the copper found in plasma is present in a serum ferroxidase called as Ceruloplasmin. This sialoglycosylated oxidase protein contains 07 atoms of copper. Ceruloplasmin activates mobilizable stores of iron present in the specific cells and bring about the release of iron[13]. Copper is mainly eliminated through bile and is responsible for most of the component of copper present in the feces. The remaining component is obtained from copper which is either not absorbed or is obtained from the desquamation of mucosal lining cells. Copper transportation through hepatobiliary tract follows a saturable kinetics pattern. This is evident from the fact that copper elimination in the bile does not increments proportionately with the dose following intravenous administration[14].

Pharmacodynamics of Copper

Copper play an important role in many oxidative processes in the human body such as produced by oxidases, cytochrome oxidase, metalloenzymes etc. In case of copper deficiency the function of these enzymes becomes erratic and thus may cause various diseases specially anemia[15,16]. Copper may also produce glucose -6-phosphate deficiency and hence a high risk of hematologic diseases[17]. Copper forms metalloprotein that is metallothionein and cytosolic copper chaperons. It activates copper-binding proteins in small peptides like albumin, ceruloplasmin, glutathione[18]. Copper undergoes entero-hepatic circulation and is excreted primarily in bile. It acts as catalyst in metabolic reactions and predisposes to mutations[19,20,21]. The copper/ zinc superoxide dismutase enzyme found in the brain, blood,, liver, lung, and thyroid is responsible for provision of protection against oxygen toxicity[22,23].

Copper toxicity is dependent on the ability of copper ions present in free form to catalyze the formation of reactive oxygen species such as superoxide and hydroxyl ions. Functioning of hepatic cytochrome P450 enzyme system is affected by copper ions. These ions bind and oxidize the cysteinyl containing residues of monooxygenase enzymes which are components of CYP450 system[24]. Increase in the levels of copper causes oxidative damage and alterations in the function of cell membranes, peroxidation of lipids, inhibition of receptors, abnormalities in liver functions, decline in fluidity, changes in the enzymes function and ionic permeation[25]. The dietary allowance of copper varies according to age, pregnancy, lactation, and for adults[26,27].

In born errors of Copper metabolism

(1) Menkes Disease: John Menkes a physician in 1962 described this disorder for the first time. It is an X-linked syndrome that has a frequency of about 1/200,000 live births. Boys are affected primarily by this disease but few girls have also been documented to be affected[28]. There is severe deficiency of copper which causes death in early years of childhood. Development and growth of brain requires certain enzymes which need copper for proper functioning and deficiency of copper is hence accompanied by severe neurological abnormalities. There is hypo-pigmentation of hairs due to lack of melanin being caused by deficiency of enzyme tyrosinase. Deficiency of cuproenzyme is also present so cross-linking of keratin does not occurs and the

hair appear steely, brittle and kinky therefore also named as "kinky hair disease." The activity of cytochrome *c* oxidase enzyme is suppressed which causes severe neurological defects including mental retardation. Death commonly occurs in children before they reach the age of ten years. Diagnosis at an initial stage and prompt management of these individuals usually fails to defer or delay death. Absorption of copper does occurs from small intestine but there is fault in pumping out of absorbed copper into the vascular tree, liver and to other parts and organs[29,30].

(2) Wilson Disease: It is also named as hepatolenticular degeneration. It is an autosomal recessive inherited disorder of copper transport that involves chromosome 13[31,32]. It is characterized by poor copper inclusion into ceruloplasmin and impaired elimination of copper in the bile. There are mutations in the enzyme Wilson copper ATPase which in turn produces alteration in the function of this enzyme. The resultant accumulation of large amounts of copper in the liver and brain causes dysfunction of these organs. Other organs like kidneys, eyes etc. are compromised to a lesser extent. The estimated incidence of Wilson disease is 1/30,000[33]. The age on onset is 3 to 50 year. Patients with Wilson disease may present commonly with features related to hepatic, neurologic, or psychiatric problems. Hepatic features may be similar to acute hepatitis. They may be self limiting or can progress rapidly to fulminant hepatitis. Conversely picture may be of chronic active hepatitis or cirrhosis with hepatic insufficiency. Deepening jaundice, encephalopathy, clotting abnormalities, intravascular coagulation, hemolytic anemia and renal insufficiency may also be present. Death occurs in untreated cases. Copper accumulates in the liver cells, which undergo lysis if capacity is exceeded thereby releasing the metal into the circulation and promoting accumulation in the tissues other than liver. Damage is mainly produced in the region of lenticular nucleus comprising of putamen and globus pallidus and is exhibited as neurological features. This is characterized by tremors particularly in arms and hands, dyskinesias and behavioral alterations. Copper deposition at the outer rim of the iris produces characteristic rusty brown rings in the eyes called as the Kayser-Fleischer rings. Ninety percent of patients with Wilson disease develop such rings[34].

(3) Other Copper-Related Hereditary Syndromes: Indian childhood cirrhosis (ICC) and idiopathic copper toxicosis (ICT), or non-Indian childhood cirrhosis are the other copper related hereditary syndromes[35]. Both syndromes have genetic predisposition and increased copper levels. In cases of ICC excessive copper ingestion is caused by heating or storing milk in copper or brass containers. In ICT excessive amount of copper is present in the drinking water supplies and is the causative agent that in turn produces elevated copper levels in the patients[36].

Biological effects of copper

It is reported that ingestion of copper salts 20–70 gm intentionally or accidentally produces features as headache, dizziness, abdominal pain, nausea, vomiting, diarrhea, increased heart rate, difficulties in respiratory process, hemolytic type of anemia, presence of blood in urine, moderate to severe GIT bleeding, hepatic and renal failure and death. Acute Exposure can occur after single or repeated intake of drinking water containing copper usually above 3–6 mg/L. It produces predominantly features of acute gastrointestinal upset such as nausea, vomiting stomach irritation. Allergic features may develop in sensitive individuals upon dermal exposure. High copper level in air produces elevated serum copper levels and hepatomegaly in workers of mining and smelting industries. Copper -T and multiload are used as intrauterine devices to prevent conception. It act by producing metal toxicity to sperm and inhibits implantation of blastocyst in the uterine endometrium as well as by inhibiting embryonic development. It has been documented that chances of spontaneous abortions are quite high in untreated females having Wilson disease.[37]Chronic deficiency of copper in infants and children produces features related to low RBC and WBC count. It also produces abnormalities of bone-marrow which subsides with supplements of copper. Copper is essentially involved in the synthesis and maturation of bone tissue, blood cells and also takes part in the neurological development. It also plays a vital role in the functions of cardiovascular and immune systems besides being involved in the process of lipid metabolism. Copper deficiency is commonly seen in babies and infants having low weight at birth and in children administered nutrition through parenteral route. Hypochromic, normocytic or macrocytic anemia with low copper plasma levels is produced. It is refractory to iron therapy and is readily reversed by copper supplements. There is defect in iron mobilization caused by decreased ceruloplasmin - ferroxidase I activity. Bone abnormalities are produced in low-birth-weight infants and young children that are similar to scurvy. Alterations in clotting factors, bone metabolism markers,[38] oxidant status, enhanced chances of infections, hypopigmentation of hair, osteoporosis, fractures of bone, abnormal bone growth etc. may also be produced. Besides genetically sensitive populations infants with low weight at birth and on cow's milk feed, pregnant and nursing women, patients on nutritional therapy through parenteral route, patients having malabsorption problems and chronic diseases, diabetics, alcoholics, elderly, athletes[39,40]. vegetarians and persons with eating disorders are also susceptible to develop copper deficiency[41].

Analytical technique

Deficiency as well as elevated level of copper both increases risk to human health[42]. Copper is present in blood, urine, feces, hair, and nails. Copper level can be measured in these samples by specific tests which are not available usually at the commercial laboratories as they require special equipment. Research related to human health requires monitoring of

metals in all biological matrices[43]. Samples are dissolved and pretreated for both organic and inorganic matrices prior to instrumental analysis. Spectrophotometry for determination of metals is one of the most important tools in chemical analysis of metals in biological samples[44]. Determination of metal levels by atomic absorption spectrometry (AAS) as mentioned above similarly requires a preliminary sample treatment[45,46]. In AAS sample preparation involve digestion, extraction and calibration by Certified Reference Material (CRMs) of analytes. Conventional sample preparation of organic materials for atomic absorption spectrometric analysis involves solubulization and or decomposition of the matrix typically achieved by wet digestion or dry ashing techniques using oxidative acids[47]. To estimate human exposure to contaminants and their concentrations, blood is generally used as a biomarker[48,49,50,51].

Thus copper is essential to human health. Along with amino acids, fatty acids and vitamins it is also needed for normal reactions of metabolism taking place in our body. Copper is not synthesized by humans therefore dietary sources must supply this element. Adult body contains 1.4 - 2.1mg of copper/ kg body weight. In the body copper activates enzymes that act as catalysts. Apart from biochemical reactions copper also provides help in the transformation of, development of and elastin tissues cross-linkages, maintenance and repairing of connective tissues[52].

Copper is also documented to be important for cardiovascular system and its deficiency predisposes to increased risk of developing coronary heart disease. Excess amount of copper in the body can be removed by utilizing specific chelating agents. Conversely using zinc in large amounts is also said to be beneficial. Brazilian nuts and cashew nuts, poppy and sunflower seeds, chickpeas, liver oysters, cereals, beef , mutton, fish etc are potential dietary sources of copper. Copper is also said to have anti-inflammatory, anti-ulcer and anticonvulsive properties. Diet must provide adequate amount of copper needed for the physiological processes of the body. Overall trend of changes in the human dietary patterns may result in inadequate copper intakes. Copper is also required for normal and healthy growth of plants and animals and this in turn can be beneficial to the humans through the food chains[53]. Toxic effect of copper is produced by its ability to incorporate and release electrons. This causes production of reactive radical ions like. Copper is said to be toxic when it is un-sequestered and un-mediated. This ultimately produces oxidative stress that plays an important role in various disease processes such as in which copper and zinc binds to. Excess level of copper are also associated with the effects of aging process[54, 55].

Copper is present in human body and this provides the proof that it is essential for human beings. Diet devoid of copper produces adverse effects that are reversible by administration of copper supplements. Copper content in adults is 50–120 mg. Highest concentrations of copper are found in liver and brain. Copper in liver is the main storage form however copper content in the basal ganglia of the brain takes part in the neurotransmitter metabolism. Intravenous nutrition therapy without addition of copper produces copper deficiency state that is exhibited as features of anemia, neutropenia etc within few weeks of copper deprivation in the patients[56].

CONCLUSION:

Copper (Cu), is an essential trace element. Both deficiency and elevated level of copper are detrimental for human health. Acute copper toxicity can predispose to a number of pathological conditions and even death in severe cases. Chronic exposure to copper produces anemia, liver toxicity and severe neurological defects.

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Perinatal Arterial Ischaemic Stroke In Neonate

Anila Haroon, Shakeel Ahmed, Syed Rehan Ali

ABSTRACT

Arterial ischemic stroke (AIS) is not uncommon in neonates, but in large part of developing world it has been missed and remains undiagnosed because of lack of resources and insufficient engagement by health care providers. The incidence of ischemic perinatal stroke ranges between 1 in 200 No, to 1 in 5000 births and is reported to be responsible for 30% to 50% of congenital hemiplegic cerebral palsy (CP) who were born at term or late preterm gestations. The true incidence of AIS from the developing world is not known as neuroimaging facilities are available in few centers; most of these cases remain undiagnosed.

Over the past decades, ischemic perinatal stroke has emerged as an important cause of brain injury in the perinatal period and remains a leading cause of cerebral palsy. We are reporting a 3 days old male baby who presented with refractory seizures, subsequently diagnosed as arterial ischemic stroke.

Key words: neonate, arterial ischemic stroke, neuroimaging

Introduction

Ischemic perinatal arterial stroke (IPS) is defined as a group of heterogeneous conditions in which there is focal disruption of cerebral blood flow secondary to arterial or cerebral venous thrombosis or embolization, happens between 20 weeks of fetal life through the 28th postnatal day and is confirmed by neuroimaging or neuro-pathologic studies[1,2]. AIS are estimated to affect 1 in 4000 neonates, 17 times more common in the perinatal age group as compared to rest of pediatric population[3]. The type of stroke and etiology depend on the age of the fetus and the infant. The left middle cerebral artery (MCA) is the most common vessel involved, with the left cerebral hemisphere the most common region area involved[4]. Infants often presents with focal or generalized seizures and sometimes with apnea, hypotonia, or episodes of duskiness, irritability, and poor feeding. Long term risks from IPS include seizure disorders and delayed or impaired language development. Neuroimaging studies remain the most important tools for the confirmatory diagnosis of IPS.

Case History

A 3 day old baby boy was born to a young primigravida at 31 weeks of gestation with emergency LSCS due to premature rupture of membranes. Pregnancy was uneventful with no known comorbids except vitamin D Deficiency. Birth weight was 2300 grams with Apgar 7 in 1 min and 9 in 5 min. On 3rd day of life, baby developed seizures and difficulty in breathing. Vitals: HR 160/min, RR 56/min, BP 60/40 mm Hg, O2 saturation 99%, Temp 36ºC, OFC 29 cm. Baby was loaded with phenobarbitone but seizures continued so loaded with another dose of phenobarbitone followed by phenytoin. Seizure was continued after every 10 to 15 minutes clinically as well as on EEG for which midazolam infusion was started. Baby responded well with cessation of seizure activity evidenced on EEG. Initial investigations revealed WBC $19.4x10^9$/L, platelets $201x10^9$/L, normal coagulation screen, CRP <0.3mg/dl (n=0-1.0), Calcium 8.0mg/dl (8.4-10.2), Lumber puncture revealed white cell count of 29 /cu mm (0-6), glucose 54mg/dl (45-80) with blood glucose of 74mg/dl (80-110) and protein count 1 gram/dl (15-40mg/dl). Baby was started on cefotaxime and amikacin in meningitic doses. Initial ultrasound head revealed grade 1 IVH on left side. Baby remained seizure free over the next 2 days but found to be hypotonic. Phenobarbitone levels were normal. Further investigation revealed Ammonia level: 166 µmol/l (18-60), Homocysteine: 13.73 µmol/l (4.72-14.05), Lactic acid: 2.0 mmol/L (2.5-5.0), Protein C: 31 (72-106%), Protein S: 34 (60-110%), Anti-thrombin III: 69 (80-120%) Factor V Leiden: 1.01 (0.9-2.9%). MRI Brain showed multiple small areas of diffusion restriction in the left thalamus and bilateral periventricular regions most likely representing areas of acute infarction (Figure 1, 2). Midazolam infusion was stopped on day 2 and baby was continued on oral phenobarbitone. Baby subsequently improved with good neurological examination and developed breast feeding. He was discharged in a stable condition, maintenance dose of phenobarbitone and orogastric feed.

Discussion

In developing countries due to limited resources and lack of expertise, AIS are not reported or missed frequently, although one way or the other doctors come across a lot of cases of cerebral palsy. Knowledge of the preexisting perinatal

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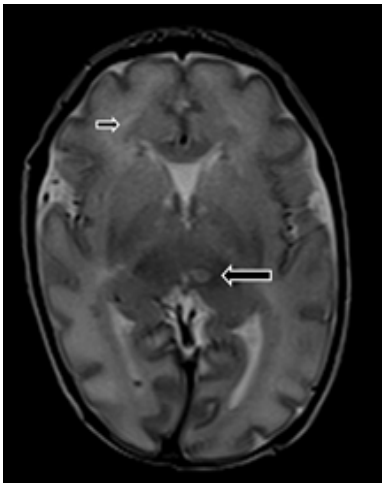

Figure 1

MRI axial image T2 weighted image. Small areas of high signal in the left thalamus (long arrow) and along the frontal horn of right lateral ventricle (short arrow) most likely representing areas of acute infarction.

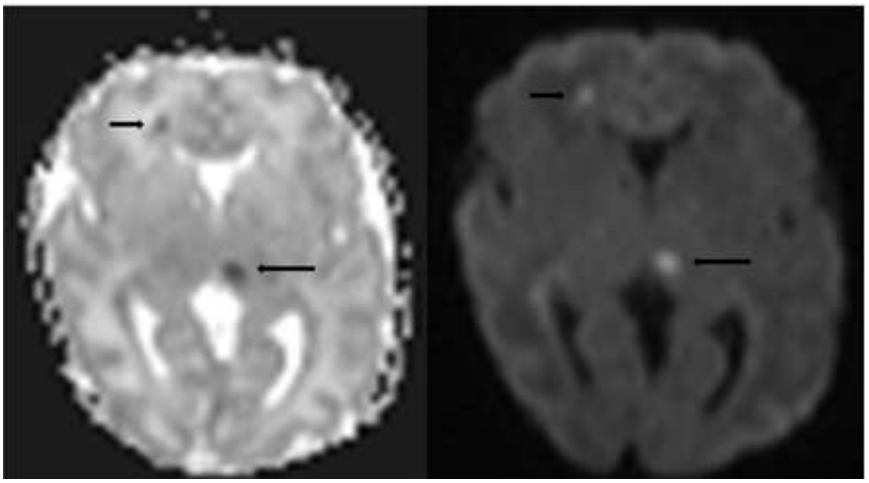

Figure 2

Diffusion weighted images. Small areas of diffusion restriction seen in the left thalamus (long arrow) and along the frontal horn of right lateral ventricle (short arrow) most likely representing areas of acute infarction.

arterial stroke (PAS) and the availability and accessibility of diagnostic modality make it possible to diagnose and manage this important condition promptly.

The Canadian stroke registry, one of the largest studies on perinatal arterial stroke, reported complicated birth asphyxia to be present in about 18% of patients[5]. Other studies have also found emergency caesarean section, vacuum extraction, prolong rupture of membranes, prolong stage II of labor and cord abnormalities to be potential risk factors for PAS[3,6].

Contrary to these findings, the national hospital discharge survey (NHDS 1980-1998) recorded perinatal asphyxia in < 5% of neonatal stroke[7]. This factor has been questioned in recent studies and while there is good evidence of an association of asphyxia with border zone cerebral ischemia, evidence to support a strong association with focal infarction is lacking. There have been reports of non-hemorrhagic arterial stroke with hereditary protein C deficiency, but larger studies have not convincingly demonstrated that protein C deficiency is a risk factor for the development of arterial thrombosis[7].

Neonates with underlying cerebral ischemia, rarely present with focal signs but may present with seizures, apneic spells, lethargy, poor feeding, birth asphyxia or hypotonia during the first 24-72 hours of life[8]. Seizures have been reported as the most common presentation of neonatal stroke. The Canadian stroke registry, has also reported similar findings; seizures in 85% of cases and hemiparesis in only 7% cases[5]. Generalized hypotonia and lethargy has been found to be the most frequent findings on neurologic examination[9].

In literature infections, dehydration and infection during the perinatal period are also a risk factor for stroke in neonate. Neonatal pulmonary hypertension and extracorporeal membrane oxygenation (ECMO) have also been stated as a risk factor in some cases[9]. The international pediatric stroke study involved 30 centers in 10 countries. They enrolled 248 neonates on the basis of symptoms and neuroimaging. They found 10% babies were premature. Seizures were commonest presentation present in 72% and non-focal neurologic signs in 63%[4].

The primary objective in the treatment of neonatal ischemic stroke is reestablishing the obstructed blood flow and thus, reduced oxygen supply. The management of neonatal stroke includes supportive care to provide adequate ventilation, meticulous fluid management, avoidance of hypotension and hypoglycemia, and treatment of seizures[10].

In developing country like us where there is limited facilities and resources for neuroimaging and other investigations, these cases are often not diagnosed and increased the morbidity in the form of cerebral palsy. Health care provide should have knowledge of this important entity and if there is high suspicion, neuroimaging should be done. A prospective study should be carried out in babies who have suspected IPS to know the real burden of this important condition in our country.

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Case Report

Adult Granulosa Cell Tumor: A Small Mass Producing Troublesome Morbidity To A Woman

Khalida Nasreen, Samreen Iqbal

Abstract:

Granulosa cell tumors are sex-cord stromal tumor ofovary, a rare neoplasmaccounting for approximately 3-5% of all ovarian malignancies. Hormone producing tumor, a total of 95% of all GCTs are adult type and of large size. A majority of women present with abdominal mass and diagnosis made on histopathology. While small size symptoms producing Granulosa cell tumors are rare and it's a rare virilizing tumor of adolescents. Adult Granulosa cell tumor is a clinically and molecularly unique subtype of ovarian cancer. The present case study reports on a case of a small size Granulosa cell tumor producing postmenopausal bleeding in 56-year-old woman.

Key words: Adult Granulosa cell tumors, ovarian carcinoma, FOXL2 C134W mutation

INTRODUCTION:

Granulosa cell tumors (GCTs) are sex-cord stromal tumor of ovaryaccounting for approximately 3-5% of all ovarian malignancies with a relatively favorable prognosis. A total of 95% of all GCTs are adult typeand 5% are juvenile type. Majority of patients are diagnosed in stage I due to the enlarge size and irregular vaginal bleeding[1,2,3].

Granulosa cell tumorpredominantly produce estrogen and androgens and these hormones are responsible for patient's symptoms like irregular vaginal bleeding, postmenopausal bleeding and hirsiutism[4]. Viralization is the prominent feature of juvenile type of Granulosa cell tumors[5]. Adolescent girls become muscular, develop excessive and male pattern body hairs, breast atrophy, and irregular vaginal bleeding. Surgical management based on stage of tumor as well as age of the patient. Premenarchal and reproductive age women with early stage disease are often managed with unilateral salpingo-oophorectomy and appropriate surgical staging in an attempt to preserve fertility. In postmenopausal women and those who have completed child bearing, surgery consists of a total abdominal hysterectomy and bilateral salpingo-oophorectomy, along with standard surgical staging[1].

Case Report:

A 56-year-old female, Nulliparous, married for 14 years, Menopausal for 10 years, presented to Gynae OPD with history of Postmenopausal bleeding on & off for the last 2 years. There is no comorbid, on examination she is of average height and built. On examination: pulse 90b/m, BP, 130/90 mmHg, temperature -98ºF, R/R 12b/m, Chest was clear on auscultation, on abdominal examination abdomen was flabby, No mass palpable, fluid thrill and shifting dullness was negative, gut sounds were audible. On Speculum examination cervix was swollen, nebothian cysts present. On bimanual examination: N/S uterus, Fornixes. On Laboratory investigations, Blood group O +, Hb%- 13 g/dl, RBs 95mg%, HepBsAg – Negative, Anti HCV antibodies- Negative.

On Ultrasound uterus- A/V, N/S, endometrium thick 1.1cm, both ovaries were normal in size. One year back her endometrial sampling was done for the same complaint and histopathology report showed that focal complex hyperplasia with endometrial polyp. She has been prescribed multiple medications from many doctors but she got temporary relief. We have planned total abdominal hysterectomy and bilateral salpingo-oophorectomy for her. Work up has been completed; fitness for general anesthesia has been taken. After taking written informed consent her total abdominal hysterectomy and bilateral salpingo-oophorectomy done and sample contain uterus, both fallopian tubes and both ovaries. Patient remains stable after operation and recovery was speedy. Histopathology report showedcervix- chronic cervicitis, Endometrium- disordered proliferative with fixation artifacts, right ovary – unremarkable, left ovary- adult Granulosa cell tumor measuring 1.5 X 1.0 cm. On immunohistochemistry: Calretinin – positive, Inhibin- positive, Ki 67- Negative. As the whole tumor removed with surgery and there was no evidence of tumor spread beyond ovary so she is not a candidate for chemotherapy or radiotherapy.

DISCUSSION:

Granulosa cell tumors are divided into two histological subtypes, classified as adult- type and juvenile - type. The adult subtype representing 95% of all Granulosa cell tumors (GCTs), occur in perimenopausal or postmenopausal women, at a peak age frequency between50 and 55 years[1,2,3]. The symptoms of the tumor occur due to its hormone production: hyperestrogenism in 97-98% of the cases, and hyperandrogenism in 2-3% of the cases. Clinical manifestations of estrogen producing tumor are amenorrhea, dysfunctional

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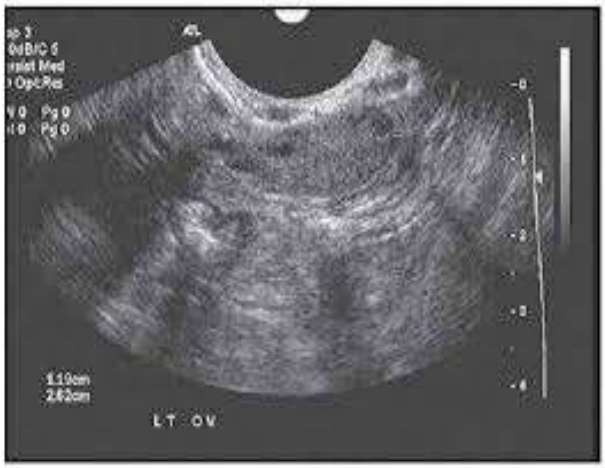
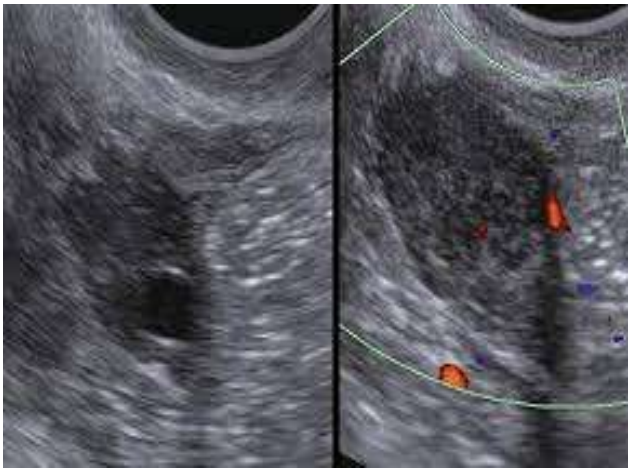


a) Normal size ovary with small cystic area measuring 1X1cm.



b) Doppler ultrasound of ovary showing active blood flow.

uterine bleeding, growth of uterine fibroids and hyperplasia of the endometrium or endometrial cancer. The symptoms and signs of rare virilizing GCTs are primary or secondary amenorrhea, hirsiutism, clitoris hypertrophy, deepening of the voice, muscular development and acne due to elevated testosterone levels[5]. GCts secrete gonadal peptides including Inhibin and Mullerian inhibiting substance (MIS) /anti-Mullerian hormone and synthesize estrogen[6]. Adult – type Granulosa cell tumors are molecularly characterized by a pethogenomic somatic point mutation402C->G(C134W) in the transcription factor FOXL2[7].

Diagnosisis based on laboratory and histopathological findings. Anti-Mullerian hormone and Inhibin-B are currently the most accurate circulating biomarkers[7].

Imunohistochemical data on estrogen and progesterone receptors in ovarian neoplasm is limited, with many reports suggesting that estrogen receptors alpha and progesterone receptor were frequently expressed in adult granulose cell tumors (66% and 98%, respectively) and Sertoli-Leydig cell tumors (79% and 86%, respectively)[8]. Microscopic features of Adult granulose cell tumor is mature follicles with Call-Exner bodies[3,9]. Adult granulosa cell tumor is most commonly detected in stage I, whereupon the prognosis is good. The disease however, recurs in one third of stage I patients and death in half of these[1,10]. Adjuvant chemotherapy, hormonal therapy, and radiotherapy were not associated with survival. Older age, more comorbidities, prior malignancy, higher stage, poor differentiation, larger tumor size, incomplete surgical staging and residual disease at a surgical margin were independently associated with increased hazard of death. Among women with stage I disease, each one centimeter increase in tumor size was associated with 4% increased hazard of death[11,12]. recurrent disease develops in up to 25% of patients, often after a long interval. Early recurring tumors had less Call –Exner bodies, higher mitotic rates and higher degrees of atypia[3,12].

CONCLUSION:

Every patient with postmenopausal bleeding should be investigating for Adult granulosa cell tumor as a small tumor can produce a troublesome morbidity to the patient. Majority of patients with granulosa cell tumors of the ovary present in early stage. Surgery is the primary treatment modality for granulosa cell tumors. Advance stage and presence of residual disease were associated with inferior survival, but only prospective studies can ascertain their definite role.

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Road Traffic Accidents And Fatal Injuries: A Global Burden

Afsheen Sayyar, Muhammad Shahrukh Khan Sadiq

INTRODUCTION

The invention of motor vehicles has raised the bar of civilization and living standard to the unprecedented level. In contemporary times, use of motor vehicles are regarded as a necessity. On the other hand, they can cause a large number of injuries and damage to property, which has exacerbated the global burden.

According to Word Health Organization (WHO), an average of Approximately 1.25 million deaths due road traffic accidents are recorded annually[1]. It is a leading cause of mortality among the young populace of ages between 16 and 35 years[2].

Low and middle-income countries are the more adversely affected, because road traffic accidents are associated with a range of factors; poor road infrastructure, inappropriate mixing of vehicle types, inadequate traffic law enforcement and delayed implementation of road safety policies[3].

Factors influencing RTAs

Following factors are associated with RTAs:

Age and Gender: Gopalakrishan et al found that males drove more miles than females and adopted fewer safety precautions[5]. About ¾ of all road traffic deaths occur in males under the age of 25 years. Only a quarter of females of the same age group are affected[1].

Increased number of vehicles: 90% of the world's fatalities on the roads occur in low and middle-income countries, even though these countries contribute to 54% of the global share of vechiles[6]. Mainly due to rapid increase in vehicle numbers and inadequate implementation in urban management and road safety strategies, road injuries occur twice as often in low and middle-income countries when juxtaposed with developed ones[7].

Road Infrastructure: Proper road structure and its adequate condition (road surface, speed breaker, pedestrian track, zebra crossing, road lights, traffic signals, and sign boards) is an important factor influencing the rate of RTAs. Olsen et al studied the data of reported RTA from the period 1997–2014 from a UK database extensively. They concluded that owing to the construction of quality M74 motorway, Glasgow and surrounding local authorities saw a 50.6% reduction in annual RTAs during the time period[8].

Lack of education about traffic regulations: Novoa et al found that the risk of death from injury is higher among uneducated drivers compared to educated ones[9]. Nearly half of global deaths due to RTA comprise of pedestrians, cyclists, and motorcyclists (also known as vulnerable road users)[1].

Timings: According to one New Zealander study, routine timings is another important factor in RTAs. According to the study, accidents occurred largely during the morning rush hour, i.e. 7:45 and 08:30. Second and third larger one occurred at around 15:00 and 17:30 that coincides with the school and office close time. More school-aged pedestrians are killed in the afternoon than in the morning[10].

Economic and Social Development: More than 90% of deaths due to RTA occur in low and middle-income countries. RTA rates are highest in the Sub-Saharan Africa. Even within developed countries, population from lower socioeconomic stratum are more vulnerable to RTAs[11].

Pattern of Injuries in RTAs:

Two major patterns of injuries are often seen in RTAs are:

1) Primary impact injuries: caused by the impact between the vehicle and the pedestrian.

Sites: Head in children and trunk and legs in adults due to collision with part of the car i.e bumper, lights, radiator or bonnet. The height of the pedestrian often determines the site and the nature of injuries[12].

2) Secondary impact injuries: caused when struck victim falls on the ground or any other stationary object.

Sites: Lower trunk and pelvic bone is more likely to be fractured. The vehicle speed and centre of gravity of collision plays a vital role[13].

Types of impacts of crash:

The driver and passenger injuries depend upon the types of impact of crash that are:

1) **Front impact crash:** The injuries in this impact are due to the car strikes on another or it strikes fixed object and resulting in impact of knees against dash board commonly causes fractures of tibia fibula femur, hips and pelvis. The circular rim of steering causes fractures of teeth, jaws, and facial bones as well as imprint abrasions, minor bruises and contusions of the chest or rib fractures. Fractured steering wheel may spokes may penetrate the chest and lacerate the heart and lungs[14].

2) **Side impact crash:** A vehicle that is struck on the side by another vehicle or that skids sideways into a fixed object sustains a side impact .Diced injuries are characteristic right

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angled or v shaped cuts caused by the diced or cubical fragments of tempered class of a broken side windows being struck by or the victim. Cervical spine fractures are common as well as fractured ribs, contusion, laceration and explosive tearing of the lungs, on the side of the impact[15].

3) **Rear impact crash:** Low velocity rear impact are relatively common resulting in whiplash or acceleration deceleration injury and causes muscle spasm and possible ligamentous injury in the neck[16].

4) **Roll over crash:** Although the automobile may suffer severe damage in a roll over crash, the occupants receive surprisingly moderate impact as the vehicle is not brought to a sudden stop and impact is spread over period of time. The belted occupants frequently survive the crash. Non belted occupants are subject to either injury due to tumbling around inside the vehicle or from striking the interior of the vehicle. Fracture and subluxation of cervical spine may occur[17].

Measures to cope up the fatal injuries

Drivers in Pakistan have poor knowledge about traffic signs and pay little attention to them, which increases the likelihood of road crashes. It is noted with concern that even the licensed drivers are involved in about 80% of fatal crashes. It implies that driving licensing system is vague and unable to ensure the proper driving skills among the licensees. This is because of the reason that licensees in Pakistan are not required to attend driving theory courses and no for - mal test is administered to assess their theoretical knowledge about road markers and traffic signs.

Even the practical tests are not stringent enough, and people get easily driving licenses by approaching the licensing authorities directly or by paying small bribes. There is an obvious need to make these criteria more stringent. The test instructors should also be trained to judge applicants' ability. Commercial passenger-carrier and goods-carrier companies must also provide road safety training to their drivers as a regular feature to update the drivers' knowledge about the traffic rules and regulations.

Conclusion

In a nutshell, education, awareness, and strict compliance with and enforcement of traffic rules and regulations are required to counter this menace. In addition, uplifting the socioeconomic dimension of worldwide populace can counter RTAs in a significant manner.

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Chickengunya

Mehwash Kashif, Haya Arshad Ali

Dear Sir,

There is a recent outbreak of the disease chickengunya in Pakistan. A lot of cases have been reported out of which majorly are from Karachi. The increase in temperature and deteriorating sanitary conditions of Pakistan further adds fuel to the fire by providing excellent breeding grounds for the arthropod vectors[1]. Thus I am writing to your esteemed journal to inform the readers about the disease and its possible ways of prevention.

Sindh Health Department released a report which stated that a total 4,329 chikungunya suspected cases surfaced in the province, out of which 3,462 were from Karachi while rest of the cases surfaced in Tharparkar/Mithi, Sanghar and Umerkot[2]. Out of total 3,462, 1740 cases were reported in District Malir, 156 in District Central, 180 in District South, 1210 in District West, 165 in District East and 11 in District Korangi[3].

"Chikungunya" word comes from the Makonde language which means to walk bent over. During an outbreak in Tanzania in 1952, disease was first described. Chikungunya is an RNA virus and a member of the Togaviridae family. It is transmitted by a bite from an infected female mosquito (Aedes aegypti and Aedes albopictus) and the symptoms appear after a few days. Symptoms include fever (sometimes as high as 104 °F), joint pain, headache, muscle pain, rash, swelling around the joints. Other symptoms include fatigue, nausea aphthae, erosions and cheilitis atypical manif neurological, cardiovascular, skin, ocular, renal and other manifestations[4].

Only a blood test can definitively diagnose chikungunya as symptoms are not always easy to tell apart from other conditions.

Currently, there is no vaccine or antiviral treatment. There are no specific drugs to treat chikungunya; doctors simply recommend rest and plenty of fluid Medication focuses on relieving the symptoms rather than the causes[5]. Seeing as the major mode of chikungunya transmission is by mosquito bite, the best methods of prevention involve minimizing contact with mosquitos. Steps that can be taken to prevent chikungunya include:

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- Using insect repellent containing DEET (N, N-Diethyl-meta-toluamide) or picaridin on skin and clothing.
- Wearing clothing that covers the whole body.
- Staying indoors as much as possible, especially during early morning and late afternoon.
- Avoiding traveling to areas experiencing outbreaks.
- Using products containing oil of lemon eucalyptus or PMD (p-Menthane-3, 8-diol) can be effective.
- Using air-conditioning - this deters mosquitos from entering rooms.
- Sleeping under a mosquito net.
- Using mosquito coils and insecticide vaporizers.

Although chikungunya is very rarely fatal, the symptoms are distressing and can be long-lived. Avoiding mosquitos is the key to prevention. The outbreak is closely tied up with the warm climate and wretched sanitary state of the city Educating the public on vector control measures such as spraying insecticides, an urgent need to rid the city of stagnant water bodies and other preventive measures should be emphasized.

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

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