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Editorial**Amebiasis: Tip of An Iceberg****Mohsin Masud Jan**

Editor

Amebiasis is an important disease of humans and other primates caused by a protozoan parasite *Entamoeba histolytica*, that is found throughout the world. The highest prevalence of amebiasis is found in developing countries where the barriers between human feces and food and water supplies are inadequate. Although most cases of amebiasis are asymptomatic or subclinical, however, dysentery, fever and invasive extraintestinal disease can occur.

Amoebic liver abscess is the most common manifestation of invasive amebiasis, but other organs can also be involved, including pleuropulmonary, cardiac, cerebral, renal, genitourinary, peritoneal, and cutaneous sites. In developed countries, amebiasis primarily affects migrants from and travelers to endemic regions, men who have sex with men, and immunosuppressed or institutionalized individuals. *E. histolytica* is transmitted by ingestion of the cystic form of the protozoa. Amoebic cysts can survive in the environment for weeks to months.

These cysts can be found in fecally contaminated soil, fertilizer or water or on the contaminated hands of food handlers. Feco-oral transmission can also occur in the setting of anal sexual practices or direct rectal inoculation through colonic irrigation devices. Excystation then occurs in the terminal ileum or colon, resulting in trophozoites, which is an invasive form of the parasite.

The trophozoites can penetrate and invade the colonic mucosal barrier, leading to tissue destruction, secretory bloody diarrhea, and colitis resembling inflammatory bowel disease. In addition, the trophozoites can spread hematogenously by means of portal circulation to the liver or even to more distant organs.

Laboratory diagnosis of amebiasis is made by demonstrating the organism or by employing immunologic techniques. In addition to standard blood tests, other laboratory studies employed for diagnosis include microscopy, culture, serologic testing, and polymerase chain reaction (PCR) assay. Treatment of amebiasis includes pharmacologic therapy, surgical intervention, and preventive measures, as appropriate. Worldwide, approximately 50 million cases of invasive *E. histolytica* disease occur each year, resulting in as many as 100,000 deaths.

This represents the tip of the iceberg because only 10% - 20% of infected individuals become symptomatic. The incidence of amebiasis is higher in developing countries. Earlier estimates of *E. histolytica* infection, based on examination of stool for ova and parasites, are inaccurate, because this test cannot differentiate *E. histolytica* from *E. dispar* and *E. moshkovskii*.

The prevalence of *Entamoeba* infection is as high as 22% in the metropolitan city of Lahore from three. One hundred and thirty five (22.5%) of the 600 samples examined were positive for *E. histolytica* cysts in the triple test fecal examination, while 101 (16.8%) of the 600 samples were positive for antigens of *E. histolytica* in the antigen ELISA. We found that 15 (11.1%) of 135 positive triple test positive samples were negative by fecal antigen ELISA. Five (11.3%) samples from upper class, 3 (7.6%) from middle class, and 7 (13.4%) from lower class were triple fecal test positive samples that were negative for fecal antigen ELISA. It is possible that this prevalence represents the prevalence of *E. dispar* or *E. moshkovskii* in our population.

Overall the highest seasonal prevalence was recorded during summers, whereas lowest during winters in both dogs and humans. It was recorded that a higher infection rate was recorded in the young. Infection was slightly higher in males than females. Sewerage water is more contaminated than tap water. Cysts of *Entamoeba histolytica* are also present in soil samples.

Metrological data played very important role in the causation of disease. One hundred and twenty (120) dogs were used in 12 controlled experiments to compare the efficacy of *Nigella sativa*, *Saussurea lappa* and *Allium cepa* with metronidazole against amoebiasis.

Efficacy was calculated on basis of reduction of cysts per gram of feces. The highest efficacy was noted in allopathic drug i.e metronidazole followed by *Nigella sativa*, *Saussurea lappa* and *Allium cepa*.

The use of *Nigella sativa* and *Saussurea lappa* was recommended for routine use. No side effects were found in any of the indigenous drugs. It was also concluded that all serum enzymes, blood parameters and serum electrolytes become normal after treatment.

Seroprevalence of Hepatitis B Virus (Hbs) In Southern Punjab

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ABSTRACT

Objective: To find out the seroprevalence of Hepatitis B Virus Antigen (HBs Ag) detected during blood screening in the candidates of recruitment in Armed forces of Pakistan from Southern Punjab.

Study Design: Observational study

Place and Duration of Study: This study was carried out at the Department of Pathology, Combined Military Hospital (CMH), Multan from January to December 2013.

Materials and Methods: Serological blood screening of blood donors and candidates coming for recruitment in armed forces of Pakistan at CMH Multan was performed. Test was performed with rapid screening kit initially and suspected cases were confirmed with third generation ELISA technique. Bio-data of Hepatitis B virus Antigen (HBs Ag) positive cases was collected, analyzed and compared with national and international literature.

Results: A total of 10666 persons were screened out, 388 (3.63%) were HBs Ag positive.

Conclusion: Seroprevalence of HBs Ag in this region is also high like rest of the world. Public awareness about the disease, prophylactic vaccination against hepatitis B, blood screening before transfusion, use of disposable syringe, proper disposal of contaminated material and prevention from sexual transmission are required to decrease the incidence and its spread.

Key Words: Hepatitis B (HBs Ag), Blood Screening, Southern Punjab.

Citation of article: Parveen S, Latif A, Ashraf. M. Seroprevalence of Hepatitis B Virus (Hbs) In Southern Punjab. Med Forum 2015;26(1):2-4.

INTRODUCTION

Hepatitis B is an infectious disease of the liver caused by the hepatitis B virus also known as "serum hepatitis",^[1] the disease has caused epidemics in parts of Asia and Africa, and it is now only endemic in China.^[2] About a third of the world population has been infected at one point in their lives,^[3] including 350 million who are chronic carriers.^[4] The virus is transmitted by exposure to infectious blood or body fluids such as semen and vaginal fluids, while viral DNA has been detected in the saliva, tears, and urine of chronic carriers. Perinatal infection is a major route of infection in endemic (mainly developing) countries.^[5] Other risk factors for developing HBV infection include working in a healthcare setting, transfusions, dialysis, acupuncture, tattooing, sharing razors or toothbrushes with an infected person, travel in countries where it is endemic, and residence in an institution.^{[3][6][7][8]} However, hepatitis B viruses cannot be spread by holding hands, sharing eating utensils or drinking glasses, kissing, coughing, sneezing, or breastfeeding.^{[8][9]} The acute and chronic consequences of hepatitis B virus infection continue to be a major

public health problem worldwide and only in United annual infections occurring over the past 2 decades.' However, because the majority of children and adults infected with hepatitis B virus do not develop clinical disease,^[10] seroepidemiologic studies provide a more comprehensive picture of the distribution of this infection than does acute disease surveillance.^[11] Trends in hepatitis B virus infection are important in evaluating the effectiveness of recommended routine vaccination of infants and younger adolescents, along with older adolescents and adults at high risk of infection.'

MATERIALS AND METHODS

This is an observational study carried out between January 2013 to December 2013 at Haematology unit of Department of Pathology, Combined Military Hospital (CMH) Multan. All the persons coming for blood screening were included in the study. Majority were the blood donors and other were the candidates for recruitment in Armed Forces of Pakistan appearing at Multan Center from different areas of Southern Punjab. Among the Blood donors, majority consisted of volunteers of Armed forces, relative of patients requiring blood at CMH, Departments of Paediatric Surgery, Nishtar Medical College and Hospital, and Institute of Child Health Multan. The study protocol consisted of the informed consent, age, address, occupation, education, marital and socio economic

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status. Five ml blood was taken from each candidate and screened for various serologically positive infective diseases including Hepatitis B (HBs Ag) by rapid kit screening technique. Seropositivity was confirmed by third generation ELISA technique. All the informations were collected on a predesigned performa. Results regarding various infective diseases as Hepatitis B, C and HIV were noted. Bio-data of Hepatitis B (HBs Ag) was separated, analyzed and compared with national and international literature.

RESULTS

A total of 10666 persons were screened for Hepatitis B (HBs Ag). Among these, 6216 persons were blood donors and 4450 were candidates for recruitment in Armed forces of Pakistan at Combined Military Hospital (CMH), Multan. In blood donors, 5990 (96%) were males and 226 (4%) were females. All the candidates for recruitment were male. This means that out of 10666 persons, 10440 (98%) were male and 226(2%) were female. Age range was between 18-40 years in blood donors while candidates for recruitment were 18-24 years old. Out of 6216 blood donors, 204(3.28%) were positive. While out of 4450 candidates for recruitments in armed forces of Pakistan 184(4.13%) were positive for HBs Ag. Overall, 10666 persons were screened and 388 (3.63%) were found positive for HBs Ag. Out of 10440, males, 381 (3.64%) and out of 226 females, 7(3.09%) were found positive.

Table No.1: Prevalence in Blood Donor Group

Total number Screened	HBs Ag +	Percentage
6216	204	3.28%

Table No.2: Prevalence in Recruits Group

Total number Screened	HBs Ag +	Percentage
4450	184	4.13%

Table No.3: Prevalence as a whole

Gender	Number Screened	HBs Ag +	Percentage
Male	10440	381	3.64%
Female	226	7	3.09%
Total	10666	388	3.63%

DISCUSSION

This study was an attempt to define the seroprevalence of HBs Ag in relatively healthy and young population in Southern Punjab. Data consisted of analysis of the results of blood screening in candidates of recruitment in armed forces of Pakistan and blood donors at CMH, Multan during a year from January to December 2013. The testing method consisted of third generation ELISA technique which is used by the majority of the screening centers. As minimum age limit for blood

donation and recruitment in Armed Forces is 18 years, so it was not possible to access the minimum age of acquisition of hepatitis B in this study. Result of our study showed that prevalence of HBs Ag in blood donors is 3.28%, in candidates for recruitment in armed forces is 4.13% .Overall, prevalence is 3.63%. HBV infection has significant morbidity and mortality worldwide. The global prevalence of HBsAg varies from 0.1% to 0.2% in Britain and USA, 3% in Greece and southern Italy and up to 15% in Africa and Asia [12]. In Pakistan, a prevalence of 10% has been estimated [13]. Different reports have estimated the prevalence of HBsAg in voluntary blood donors from 0.82% to 5% [14-17]. An estimated one-third of the world's population has serologic evidence of past infection, and the virus causes more than 1 million deaths annually [18] [14]. In the USA, the incidence of HBV infection declined from about 0.014% to about 0.003% during the last two decades [19] [15]. However, there are still 1.25 million adults and children in the USA with chronic HBV infection. In South-East Asia, China, and Africa, HBV infection has high prevalence of chronic infection (5% to 20%). In contrast, 80% of infections in the USA, Canada and western Europe occur in adults via sexual contact or intravenous drug use, leading to a much lower baseline prevalence (0.1%). In the USA, groups at increased risk for HBV infection have been identified [20]

CONCLUSION

In this study, prevalence of HBs Ag is comparatively high and still increasing. Certain steps should be taken to stop the increasing trend of Hepatitis B like monitoring disease incidence and determine the sources of infection and modes of transmission. Certain control measures should be taken like immunization; the most effective and cost saving means of prevention, along with education of high risk groups and health care personnel to reduce the chances for transmission to other. Ensuring the safety of patients by reducing the residual risk of transfusion-transmitted hepatitis is the concern of every transfusion center. Pre-donation counseling, donor self-exclusion and ensuring 100% voluntary blood donation will be effective. Use of disposable syringes for injections and incineration of contaminated material is mandatory

REFERENCES

1. Barker LF, Shulman NR, Murray R, Hirschman RJ, Ratner F, Diefenbach WC, et al. Transmission of serum hepatitis. 1970. J Am Med Assoc 1996;276 (10):841-844.
2. Williams R. Global challenges in liver disease. Hepatology (Baltimore, Md) 2006;44(3): 521-526.
3. Hepatitis B. World Health Organization (WHO). Retrieved 2009-09-19.

4. Schilsky ML. Hepatitis B "360" Transplantation Proceedings 2013;45 (3): 982–985.
5. Coopstead, Lee-Ellen C. Pathophysiology. Missouri: Saunders 2010;886–7.
6. Sleisenger MH, Feldman M, Friedman LS. Fordtran's gastrointestinal and liver disease: pathophysiology, diagnosis, management. 8th ed. Philadelphia: Saunders; 2006.
7. Kidd-Ljunggren K, Holmberg A, Bläckberg J, Lindqvist B. High levels of hepatitis B virus DNA in body fluids from chronic carriers. The J of Hospital Infect 2006;64 (4): 352–7.
8. Hepatitis B FAQs for the Public — Transmission". U.S. Centers for Disease Control and Prevention (CDC). Retrieved 2011-11-29.
9. "Hepatitis B". National Institute of Health. Retrieved 2010-11-23.
10. Bhattacharya P, Chandra PK, Datta S, Banerjee A, Chakraborty S, Rajendran K, et al. Significant increase in HBV, HCV, HIV and syphilis infections among blood donors in West Bengal, Eastern India 2004-2005: Exploratory screening reveals high frequency of occult HBV infection. World J Gastroenterol 2007;21: 3730-37.
11. Behal R, Jain R, Behal KK, Bhagoliwal A, Aggarwal N, Dhole TN. Seroprevalence and risk factors for hepatitis B virus infection among general population in Northern India. Arq Gastroenterol 2008;45:137-40.
12. Pahuja S, Sharma M, Baitha B, Jain M. Prevalence and trends of markers of Hepatitis C Virus, Hepatitis B Virus and Human Immunodeficiency Virus in Delhi blood donors: A Hospital Based Study. Jpn J Infect Dis 2007;60:389-391.
13. Singh B, Kataria SP, Gupta R. Infectious markers in blood donors of East Delhi: prevalence and trends. Indian J Pathol Microbiol 2004;47:477-479.
14. Karki S, Ghimire P, Tiwari BR, Rajkarnikar M. HBsAg serosurveillance among Nepalese blood donors. Annals of Tropical Medicine and Public Health 2008;1:15-18.
15. Mathai J, Sulochana PV, Satyabhama S, Nair PK, Sivakumar S. Profile of transfusion transmissible infections and associated risk factors among blood donors of Kerala. Ind J Pathol Microbiol 2002;45: 319-322.
16. Sonwane BR, Birare SD, Kulkarni PV. Prevalence of seroreactivity among blood donors in rural population. Indian J of Med Sci 2003;57:405-407.
17. Singhvi A, Pulimood RB, John TJ, Babu PG, Samuel BU, Padankatti T, et al. The prevalence of markers for hepatitis B and human immunodeficiency viruses, malarial parasites and microfilaria in blood donors in a large hospital in south India. J Trop Med Hyg 1990;93:178-82.
18. Chattoraj A, Behl R, Kataria VK. Infectious Disease Markers in Blood Donors Medical journal Armed Forces of Ind 2008;64: 33-35.
19. Karandeep Singh, Sudha B, Shamee S Trend in seroprevalence of Hepatitis B virus infection among blood donors of coastal Karnataka, Ind J Infect Dev Ctries 2009; 3(5):376-379.
20. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines—2002. Morbidity and mortality weekly report, 2002, 51(RR06).

Frequency of Pregnancy Induced Hypertension in Teenage Pregnancy

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ABSTRACT

Objective: To determine frequency of Pregnancy Induced Hypertension in teenage pregnancy.

Study Design: Descriptive Cross Sectional Study

Place and Duration of Study: This study was conducted at Shaikh Zaid women hospital Chandka Medical College Hospital Larkana from 1st June 2013 to 1st December 2013.

Materials and Methods: A total of 163 women with singleton pregnancy having gestational age from 20 weeks onwards were included in this study. Gestational age was diagnosed on earlier dating ultrasound and from last menstrual period (LMP). Pregnancy induced hypertension was diagnosed on the basis of clinical examination which was done by measuring blood pressure via well maintained sphygmomanometer. Data was recorded on predesigned proforma including age, parity, gestational age and frequency of teenagers with high blood pressure.

Results: Frequency of pregnancy induced hypertension in teenage pregnancy was observed in 21.47% in our study population. The age group of patients affected mostly with pregnancy induced hypertension was 16 to 17 years of age, and their mean age was 16.35 ± 1.68 years while mean gestational age of the patients was 27.04 ± 3.44 weeks. Looking in to parity of patients, 64 (39.26%) women were primigravida, 64 (39.26%) were primipara (having already given birth to one baby) and 35 (21.47%) had Parity of 2.

Conclusion: Teenage pregnancy is associated with higher risk of pregnancy induced hypertension. Teenage mothers generally encounter more problems during pregnancy and child birth than older women. Early booking, good care during pregnancy and delivery and proper utilization of contraceptive services can prevent the complications in this group.

Key Words: Pregnancy induced hypertension, Teenage pregnancy, complications

Citation of article: Shaikh S. Frequency of Pregnancy Induced Hypertension in Teenage Pregnancy. Med Forum 2015;26(1):5-8

INTRODUCTION

Teenage pregnancy is defined by international organizations as a pregnancy occurring in girl aged 13 to 19 years.¹ Approximately 11% of all births occur in teenage mother worldwide.² Around the world fifteen million women less than 20 years of age bear child which is one fifth of all births.³

These teenage adolescent girls face extensive health hazards during pregnancy and childbirth, contributing for 15% global load of diseases for maternal morbidities and consequently maternal deaths up to 13%.⁴

The circumstances in South Asian countries are unsympathetic, as there are greater shares of teenage pregnancy in this region due to communal practice of early marriage and subsequently social hope to have a child soon after marriage.⁵

Teenage pregnancies parallel to a time when there is ongoing changeover from childhood to adulthood with

probable encounter between physical and Psychological emotional and social development.⁶

Pregnancy induced hypertension have been seen in 12% of teenage group in comparison to 5% in adult group. The consensus on etiology of pregnancy induced hypertension is not entirely agreed and immunological factors seem to trigger the placental diseases where genetic arrangement governs maternal vulnerability.⁷ Study conducted in Bangladesh where social conditions are almost same as prevalent in Pakistan, concluded that more than 50% teenagers suffer from pregnancy induced hypertension, eclampsia, obstructed labour, postpartum hemorrhage and other childbirth complications.⁸

The prevalence of teenage pregnancy is still high worldwide, plenty of research has been done regarding the risk factors, complications and outcome of teenage pregnancy, but studies specifically focused on frequency of pregnancy induced hypertension in teenage pregnancy in scarce in Pakistan, so this study had been planned to observe specifically the frequency of induced hypertension in teenage mothers to identify the burden of this diseases and to take efficient steps in reducing the maternal and fetal morbidity and mortality in teenage pregnancies..

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MATERIALS AND METHODS

In this cross sectional study, a total of 163 teenage pregnant women were included. Sample size calculated according to prevalence of condition (12%)⁷ with non-probability consecutive sampling technique keeping confidence interval of 95% and absolute precision required 5%. These women were selected from outpatients department (OPD) and from the obstetric ward of Shaikh Zaid Women Hospital Larkana from 1st June 2013 to 1st December 2013 after informed written consent, once they were fulfilling inclusion criteria which are as under:

Inclusion Criteria:

- Age between 13 to 19
- Gestational age from 20 weeks onwards
- Singleton pregnancy on dating ultrasound
- Primigravidas and women with parity 1 or 2

Exclusion Criteria:

- Age of 20 or more than 20 Years
- Mother with major illness such as diabetes, chronic Hypertension and renal disease.
- Multi fetal pregnancy
- Smoking
- Congenital anomalies
- Pre-eclampsia and Eclampsia

Gestational age was diagnosed on earlier dating ultrasound and from last menstrual period. Pregnancy induced hypertension was diagnosed on the basis of clinical examination done by measuring blood pressure via well maintained sphygmomanometer. The criteria taken for hypertension was Blood pressure more than or equal to 140/90 and Urine for Albumin sent to Pathology lab for excluding preeclampsia. Information regarding age of women, parity and gestational age was taken from each patient. Data was recorded on predesigned proforma. Data was entered and analyzed using SPSS 10. Mean and standard deviation were computed for quantitative variables like age, gestational age. Frequency and percentage were presented for qualitative variables like pregnancy induced hypertension.

RESULTS

A total of 163 women with singleton pregnancy, gestational age from 20 weeks onwards were included in this study. Most of the patients were 16 to 17 years of age as presented in figure 1. The mean age and gestational age of the patients was 16.35 ± 1.68 years and 27.04 ± 3.44 weeks respectively as shown in table 1. Regarding parity status, 64(39.26%) women were primigravida, while 64(39.26%) came with history of having already given birth to one child (primipara) and 35(21.47%) had Para 2.

Frequency of pregnancy induced hypertension in teenage pregnancy was observed in 21.47% (35/163). Percentage of women with PIH was 30.2% in 13 to 15 years of age, 17.4% in 16 to 17 years of age and 19.6% had 18 to 19 years of age women. Significant difference was not observed among different age groups ($p=0.25$) as shown in table 2. Similarly frequency of PIH was also not significant between gestational age ($p=0.39$).

Table No.1: Descriptive Statistics of Study Patients n=163

Statistics		Age (Years)	Gestational Age (weeks)
Mean		16.35	27.04
Std. Deviation		1.68	3.44
95% Confidence Interval for Mean	Lower Bound	16.09	26.5
	Upper Bound	16.61	27.57
Minimum		13	20
Maximum		19	34

Table No.2: Frequency of pregnancy induced hypertension in teenage pregnancy with respect to age group

Age Groups (Years)	Pregnancy induced hypertension		Total
	Yes	No	
13 to 15 Years	13(30.2%)	30(69.8%)	43
16 to 17 Years	12(17.4%)	57(82.6%)	69
18 to 19 Years	10(19.6%)	41(80.4%)	51
Chi-Square=2.74; $p=0.25$			

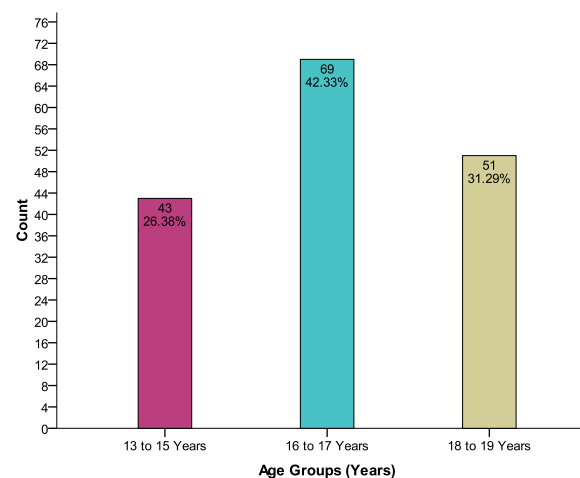


Figure No.1: Patients age groups.

DISCUSSION

Teenage pregnancy is a high risk pregnancy. Pakistan's environment is mired in aboriginal customs so consanguineous and early age marriages are beyond expectations, hence is rise in adolescent pregnancy. According to Pakistan demographic survey, up to 18 years of age 40% young girls get married.⁹ The

worldwide occurrence of ill-timed births and low birth weight is greater among teenage mothers and as because these girls have poor eating practices and are less likely to take adequate nutrition during pregnancy therefore, always at superior threat of having medical complications.

In our study most of the patients were of 16 to 17 years of age. The mean age patients was 16.35 ± 1.68 years which is very tender age and likely to have more problems as compared to adults. Closely related figures are seen in study done in Malaysia, where majority of teenage mothers were of 17 years,¹⁰ while in India it was 18 years.¹¹ However study done by Nusrat and colleagues involving multiple centers of Sindh province of Pakistan, the median age of adolescent pregnant women was 19 years.¹²

We had in our study observed the parity status as 39.26% women were primigravida, and surprisingly equal number was of (39.26%) mothers having history of already given birth to one child (primipara), may be because of earlier marriage in this age group and the rest of girls were even were (21.47%) Para 2. Highest number of nulliparous mothers were found in a study from a developing country Nigeria where these young nulliparous mothers even comprised up to 92% of study population.¹³ We had 21.47% mothers having parity of 2 even. Pregnancy outcome for teenage multiparous mothers is considered to be worse from complication point of view than those teenagers having first experience of child birth¹⁴. This later group's parity indicates poor consumption of contraceptive method and improper planning so these women had by this time two children before the age of 20 years. Level of education has been considered as predictor of marriage and higher is the education definitely late is marriage elderly is parous woman.¹⁵

Researchers are of opinion that young married women might not use the utmost ways of pregnancy prevention and seems to have more unintended pregnancies despite living in developed countries.^{16,17}

In present study frequency of pregnancy induced hypertension (PIH) in teenage pregnancy was observed in 21.47% (35/163). Our figures correlate with studies, where apart from other complications PIH found to be of 20%¹⁸ in one international and it was 18% in a local study.¹² Two other studies have concluded the frequency of Pregnancy induced hypertension in their studied population of teenage mothers was 30% and 32% respectively.^{19,20}

In spite of the extensive societal changes that have befallen during the previous two to three decades, the South Asian countries still have the highest level of teenage childbearing. According to one survey done in Bangladesh, more than 50% teenagers mothers suffer from pregnancy induced hypertension, eclampsia, obstructed labour, postpartum hemorrhage and delay in delivery of placenta risking them to face death.⁸ Same

magnitude of disease where only group of 70 teenage mothers were involved surprisingly showed the frequency of hypertensive disorders even up to 37% which is quite higher from our figures.²¹

In this study percentage of women with PIH was 30.2% in 13 to 15 years of age, 17.4% in 16 to 17 years of age and 19.6% had 18 to 19 years of age women. Significant difference was not observed among different age groups ($p=0.25$).

Teenage pregnancy is a polygonal problem and equally biologic and communal aspects add to the misery. Dearth, melancholy and social segregation are frequent trappings. Consequential stress on the teenage mothers may also lead to hostile occurring of chain of events undesirable for mothers.

CONCLUSION

Teenage pregnancy is connected with advanced risk of pregnancy induced hypertension. Teenage mothers generally come across with more problems during pregnancy and child birth than older women. Early booking, good care during pregnancy and delivery and proper consumption of contraceptive services can avert the worries in this group. Efforts need to be directed towards strict enforcement of laws prohibiting teenage marriage in Pakistan. Access to quality health services that are gender-sensitive and adolescent-friendly should be ensured.

REFERENCES

1. UNICEF. Fact Sheet: World Population Day. UNICEF Malaysia Communications Young People and Family Planning: Teenage Pregnancy; 2008; Available from: http://www.unicef.org/malaysia/Teenage_Pregnancies_Overview.pdf, Accessed 02/12/12.
2. James RE. Position paper on mainstreaming adolescent pregnancy in efforts to make pregnancy safer. WHO Geneva Switzerland 2010.
3. WHO. Maternal mortality ratios and rates: a tabulation of available information. 3rd Edition, World Health Organization 1991; Geneva. WHO/MCH/MSM/91.6.
4. World Health Organization. Adolescent pregnancy—unmet needs and undone deeds: a review of the literature and programs. Geneva, Switzerland: WHO Press; 2007.
5. Kovaivisarach E, Chairaj S, Tosang K, Savapiryanont AS, Chotigeat U. Outcome of teenage pregnancy in Rajavithi Hospital. J Med association Thai 2010;93(1):1-8.
6. Khashan AS, Baker NP, Kenny LC. Preterm birth and reduced birth weight in first and second teenage pregnancies a register based cohort study. BMC pregnancy and Childbirth 2010;10:31-6.

7. Naqvi MM, Naseem A. Maternal and fetal risks associated with teenage and adult pregnancy. *JRMC* 2010;14 (1):40-2.
8. Banerjee B. Teenage pregnancy: a socially inflicted health hazard. *Ind J Comm Med* 2009;34(3): 227-231.
9. Pakistan Demographic and Health Survey 2006-07. Islamabad, Pakistan: National Institute of Population Studies and Macro International Inc. 2008.
10. Sulaiman S, Othman S, Razal N, Hassan J. Obstetric and perinatal outcome in teenage pregnancies. *S Afr J OG* 2013; 19 (3):74-7.
11. Kumar A, Singh T, Basu S, Pandey S, Bhargava V. Outcome of teenage pregnancy. *Ind J Pediatr* 2007; 74 (10):927-931.
12. Shah N, et al. Comparison of obstetric outcome among teenage and non-teenage mothers from three tertiary care hospitals of Sindh, Pakistan. *J Pak Med Assoc* 2011; 61 (10): 963-7.
13. Udo A, Ekott M, Ekanem E. Teenage Pregnancy and Adverse Birth Outcomes in Calabar, Nigeria. *The Int J of Gyne and Obst* 2013;17 (2).
14. Klerman LV. Risk of poor pregnancy outcomes: is it higher among multiparous teenage mothers? *J Adolesc Health* 2006;38 (6):761-4.
15. Akter S, Rahman MM. Direct and Indirect Effects of Socioeconomic Factors on Age at First Marriage in Slum Areas, Bangladesh. *Chinese J Population Resources and Environment* 2009;7(3):79-82.
16. Rashid SF. Emerging changes in reproductive behavior among married adolescent girls in an urban slum in Dhaka, Bangladesh. *Reprod Health Matters* 2006; 14(27):151-9.
17. Whitaker AK, Gilliam M. Contraceptive care for adolescents. *Clin Obstet Gynecol* 2008;51(2): 268-280.
18. Chahande MS, Jadho AR, Wadhwa SK, Udhade S. Study of some epidemiological factors in teenage pregnancy hospital based case comparison study. *Ind J Comm Med* 2002;27:106-9.
19. Saxena P, Salhan S, Chattopadhyay B, Kohli M, Nandan D, Adhish SV. Obstetric and perinatal outcome of teenage and older primigravidas- a retrospective analysis. *Health and Population: Perspectives and Issues* 2010;33(1):16-22.
20. Rudra S, Bal H, Singh S. A retrospective study of teenage pregnancy in a tertiary care hospital. *Int J Reprod Contracept Obstet Gynecol* 2013; 2(3): 383-87
21. Grover N, Sandhu KK. Teenage Pregnancy: Too Much Too Soon. *JSAFOG* 2009; 1(3):41-3.

Relationship of Testosterone with Hemoglobin in Healthy Fertile Males

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ABSTRACT

Objectives: To establish a probable relationship of serum total testosterone with hemoglobin under normal physiological conditions in Pakistani population.

Study Design: Cross sectional study.

Place and Duration of Study: This study was carried out at the Institute of Basic Medical Sciences, Department of Physiology, Dow University of Health Sciences, Karachi from September 2010 to September 2011.

Material and Methods: 200 apparently healthy, non-smoker and adult males of age group 30 – 50 years were selected by convenient sampling. Early morning samples of serum total testosterone and hemoglobin were obtained by venipuncture after detailed medical history and thorough physical examination. All the tests were done on the same day and results were calculated.

Results: The mean (\pm SD) total testosterone was 15.92 (\pm 6.32) nmol/L. The frequency of low serum total testosterone was 13.5%. The frequency of anemia was 4.0%. Hemoglobin and MCHC directly correlated with total testosterone ($p < 0.05$) while PCV, RBC count and MCH did not show significant correlation ($p > 0.05$).

Conclusions: Low testosterone is prevalent in Pakistani apparently healthy males in the age group 30-50 years. Significant direct relationship of testosterone with hemoglobin showed that physiological variations in testosterone can modulate hemoglobin status in middle age apparently healthy sedentary Pakistani men.

Key Words: Serum total testosterone, hemoglobin, middle age.

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INTRODUCTION

Testosterone is the main androgen secreted in males causing genital growth and development and is essential for reproducibility. In addition, testosterone not only affects body musculature¹ and bone mass² but also erythropoiesis.³ Testosterone affects erythropoiesis by multiple mechanisms including both erythropoietin dependent⁴ and independent mechanisms⁵. Anemia has been observed as the frequent feature of hypogonadism in men.^{6,7} On the contrary, men receiving testosterone replacement therapy may experience polycythemia.^{8,9,10} The relationship of testosterone with hemoglobin in middle age apparently healthy men is not well defined.

MATERIALS AND METHODS

200 males aged 30-50 years were selected for the study by purposive sampling. The study was carried out at Institute of Basic Medical Sciences (IBMS), Dow University of Health Sciences (DUHS) from 2010 to 2011. The following were excluded from the study: Smokers; Variable levels of testosterone in smokers have been reported.^{11,12,13}

Individuals indulged in regular heavy exercise; Higher

physical activity has been associated with increased testosterone,¹⁴ individuals suffering from diseases like asthma, TB, diabetes mellitus, hypertension, ischemic heart disease; testosterone level tends to decline with acute/chronic illness by 10 to 15%,¹⁵ individuals with total leucocyte count more than 11×10^9 cells, with recent history of malaria and/or jaundice, acute or chronic blood loss and/or anemia on clinical examination. Individuals having reticulocyte count more than 2.5%, and/or serum creatinine level more than 1.5mg/dl. Individuals with history of testosterone supplementation; it leads to the suppression of endogenous testosterone, and/or with history of hypogonadism and signs and symptoms including decreased libido and erectile dysfunction with evidence of low testosterone from medical records.

A total of 245 individuals were interviewed from 2010 to 2011. Out of these 245 individuals, 26 were smokers, 17 had systemic disease (3 having diabetes with hypertension, 2 with ischemic heart disease, 8 with diabetes mellitus, 2 with bronchial asthma, 1 with obstructive uropathy, 1 with glomerulonephritis) and were excluded on the basis of history, clinical examination and laboratory investigations where available. In addition, 2 participants consented but did not come up for sampling. So they were also excluded from the study. This eventually led to the final sample size of 200.

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Informed written consent, approved by Institutional Review Board (IRB) of DUHS, was taken by the subjects willing to participate in the study. Detailed medical history with general and systemic examination was carried out and findings were recorded on prescribed proforma approved by IRB of DUHS.

Weight and height of participants were recorded on proforma and blood samples were collected from one of the peripheral veins of arm in the morning as testosterone shows diurnal variation and low levels in the evening. All tests were done in Dow Diagnostic Reference Research Laboratory (DDRRL) on the same day. The results were computed on SPSS version 16.0.

RESULTS

The mean age of the respondents was 38.72 ± 6.56 . The mean weight and height were recorded as 73.17 ± 12.66 kg and 1.71 ± 0.06 m respectively. Mean serum total testosterone, hemoglobin, red cell count, packed cell volume (PCV), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC) of the sample is shown in table 1. 13.5% of participants had testosterone lower than normal. The comparison of mean values between two groups of testosterone showed significant differences for hemoglobin and MCV ($p < 0.05$), whereas insignificant difference in mean values for RBC count, PCV, MCH and MCHC (p value > 0.05). Pearson correlation showed that serum testosterone directly correlated with hemoglobin and MCHC. (p value < 0.05) as shown in table 2.

Table No.1: Mean values of Testosterone, Hemoglobin, RBC count, PCV, MCV, MCH and MCHC

Variable	Mean \pm SD
Testosterone	15.92 ± 6.32 nmol/L
Hemoglobin	14.95 ± 1.25 g/dl
RBC count	$5.23 \pm 0.49 \times 10^{12}$ /L
PCV	44.56 ± 3.62 %
MCV	83.86 ± 5.25 fl
MCH	28.24 ± 1.91 pg
MCHC	33.02 ± 1.35 g/dl

Table No.2: Correlation between Testosterone and Hematological Variables

	Correlation Coefficient(r)	p value [†]
Hemoglobin	.162	0.022
RBC count	.043	0.544
PCV	.092	0.197
MCV	.046	0.515
MCH	.135	0.057
MCHC	.217	0.002

[†] Significant < 0.05

DISCUSSION

Testosterone levels have been investigated in many parts of the world including Pakistan with main stay of focus being infertility. Aging males experience decreased levels of testosterone after the age of 30 to 40 years¹⁶ showing a longitudinal decline of about 1.6% per year.¹⁵ In our study, the frequency of testosterone deficiency in Pakistani healthy, non-smoking males aged 30 to 50 years was found to be 13.5%. Harman, et al reported prevalence of serum total testosterone deficiency as 20% above 60 years.¹⁷ In Indian healthy population aged 40 to 60 years, 24.2% frequency of low total testosterone has been reported.¹⁸ The differences observed between the present study and other studies may be related to the differences in populations studied and/or criteria used to define the end point. Moreover, present study was conducted on Pakistani healthy males living in Pakistan, 20% higher levels were observed by Orwoll et al in Asians who were living in Japan and Hong Kong as compared to Asians living in USA, suggesting some geographical impact on testosterone levels.¹⁹ The mean total testosterone in this study was 15.92 nmol/L which was consistent with mean testosterone of 14.6 nmol/L reported by Heald et al for Pakistani men residing in England suggesting the role of ethnicity in testosterone.²⁰

In the present study, it was observed that the mean hemoglobin level was 14.95 g/dl which was lower as compared to 15.91 g/dl in the study by Tahir, et al²¹ However, Usman, et al²² observed mean hemoglobin as 13.04 g/dl which is low as compared to the present study. Beutler reported mean hemoglobin of 15.23 g/dl from National Health and nutrition examination survey (NHANES III) and Scripps Kaiser database²³ which is in accordance with the present study.

The frequency of anemia in the present study was 3.0%. Yeap, et al reported 3.7% prevalence of anemia in males 30-94 years old.²⁴ Tahiret al reported 1.5% frequency of anemia in male students of Peshawar University.²¹

In present study, mean RBC count was 5.2×10^{12} /L, mean PCV was 44.5%, MCV was 83.86 fl, MCH was 28.24 pg and MCHC was 33.02 g/dl which all were higher than Usman et al, who reported mean RBC count (5.3×10^{12} /L), PCV (39%), MCV (76.30 fl), MCH (25.54 pg) and MCHC (32.27 g/dl).²² Tahiret al reported higher PCV (46.49 %), RBC count (5.41×10^{12} /L) and MCV (84.09 fl) while lower MCH (27.74 pg) and MCHC (32.12 g/dl) than present study.²¹

It has been well established that the anemia due to testosterone deficiency is mild and normocytic normochromic.²⁵ Willoughby and colleagues found no statistical difference in MCV, MCH, MCHC, PCV, RBC count and hemoglobin in young eugonadal men with 400% average increase in total testosterone after 8 weeks of aromatase inhibitor therapy.²⁶ Contrary to

this, it was observed in the present study that MCHC directly correlated with testosterone (p value < 0.05). Coviello et al⁵ found insignificant relationship of testosterone with soluble transferrin receptors which are regarded as an indicator of bone marrow iron stores and bone marrow activity. Testosterone is one of the determinants of hemoglobin, and its deficiency alone, may not be able to create clinically significant anemia. None of the participants of present study had anemia on clinical examination and all had normocytic normochromic peripheral film.

In present study, no statistical significant difference was observed between two testosterone groups and PCV or RBC count. In contrast, Rochira et al²⁷ and Coviello et al⁵ observed significant rise in PCV and red cell count with exogenous testosterone treatment. This may be the effect of supraphysiological dose of testosterone administered as compared to normal physiological variation of testosterone producing different dose related effect on RBC count and PCV.

In this study, significant direct relationship of age adjusted total testosterone was found with hemoglobin in males aged 30-50 years. This finding is consistent with Ferruciet al²⁸ who also found significant age adjusted correlation of testosterone with hemoglobin in males and females aged more than 65 years but insignificant correlation with males alone. Yeap et al also found significant correlation of both total and bioavailable testosterone in males spanning middle to old age.²⁴

The strengths of the study were; the study provided estimates of testosterone levels in middle age sedentary non-smoker men and its physiological relationship with hemoglobin in Pakistani population. This study was done on apparently healthy population so that confounding factors like acute and chronic diseases were minimized both for the estimation of testosterone and hemoglobin. Sampling of blood was not associated with storage of samples for any length of time (tests were done within 4 hours of sampling) as storage of serum total testosterone may lead to the degradation of SHBG thus giving high levels of testosterone.¹⁷

The limitations of the study were; sampling was convenient and was done in one point of time and Sex Hormone Binding Globulin (SHBG) could not be measured.

It is recommended that males with mild anemia should be looked for testosterone level when no other cause is found.

CONCLUSION

Low testosterone is prevalent in Pakistani apparently healthy males in the age group 30-50 years. Significant direct relationship of testosterone with hemoglobin showed that physiological variations in testosterone can modulate hemoglobin status in middle age apparently healthy sedentary Pakistani men.

REFERENCES

1. Bhasin S, Woodhouse L, Casaburi R, Singh AB, Bhasin D, Berman N, et al. Testosterone dose-response relationships in healthy young men. *Am J Physiol Endocrinol Metab* 2001;281:1172-1181.
2. ¹Yilmaz D, Ersoy B, Bilgin E, Gumuser G, Onur E, Pinar ED. Bone mineral density in girls and boys at different pubertal stages: relation with gonadal steroids, bone formation markers, and growth parameters. *J Bone Miner Metab* 2005;23:476-82.
3. Hero M, Wickman S, Hanhijarvi R, Siimes M, Dunkel L. Pubertal up regulation of erythropoiesis in boys is determined primarily by androgen. *J Pediatr* 2005;146:245-252.
4. ¹Flora F, Irene P, Brown R, Cunningham I, Handelsman DJ, Liu YP. Trough serum testosterone predicts the development of polycythemia in hypogonadal men treated for up to 21 years with subcutaneous testosterone pellets. *Eur J Endocrinol* 2010;162:385-390.
5. Coviello AD, Kaplan B, Lakshman KM, Chen T, Singh AB, Bhasin S. Effects of graded doses of testosterone on erythropoiesis in healthy young and old men. *J Clin Endocrinol Metab* 2008;93:914-919.
6. Rhoden EL, Morgentaler A. Risks of testosterone-replacement therapy and recommendations for monitoring. *N Engl J Med* 2004; 350: 482- 492.
7. Kelleher S, Conway AJ, Handelsman DJ. Blood testosterone threshold for androgen deficiency symptoms. *J Clin Endocrinol Metab* 2004; 89: 3813-7.
8. Stergiopoulos K, Brennan J, Mathews R, Setaro F, Kort S. Anabolic steroids, acute myocardial infarction and polycythemia: A case report and review of the literature. *Vascular Health Risk Management* 2008;4:1475-80.
9. ¹Bhasin S, Cunningham G, Hayes F, Matsumoto A, Snyder P, Swerdloff R, et al. Testosterone therapy in adult men with androgen deficiency syndromes: An endocrine society clinical practice guideline. *J Clin Endocrinol Metab* 2006; 91: 1995-2010.
10. Amory K, Watts B, Easley A, Sutton R, Anawalt D, Matsumoto M, et al. Exogenous testosterone or testosterone with finasteride increases bone mineral density in older men with low serum testosterone. *J Clin Endocrinol Metab* 2004; 89: 503-510.
11. Al-Matubsi HY, Kanaan RA, Hamdan F, Salim M, Oriquat GA, Al Hanbali OA. Smoking practices in Jordanian people and their impact on semen quality and hormonal levels among adult men. *Cent Eur J Public Health* 2011; 19: 54-9.
12. Ramlau-Hansen HC, Thulstrup MA, Aggerholm AS, Jensen SM, Toft G, Bonde PJ. Is smoking a risk factor for decreased semen quality? A cross-

- sectional analysis. *Human Reproduction* 2007; 22: 1188-1196.
13. Pasqualotto FF, Sobreiro BP, Hallak J, Pasqualotto EB, Lucon AM. Cigarette smoking is related to a decrease in semen volume in a population of fertile men. *BJU Int* 2006; 97: 324-6.
 14. Wu FC, Tajar A, Pye SR, Silman AJ, Finn JD, O'Neill TW, et al. Hypothalamic-pituitary-testicular axis disruptions in older men are differentially linked to age and modifiable risk factors: the European male aging study. *J Clin Endocrinol Metab* 2008; 93:2737-2745.
 15. Feldman HA, Longcope C, Derby CA, Johannes CB, Araujo AB, Coviello AD, et al. Age trends in the level of serum testosterone and other hormones in middle aged men: Longitudinal results from the Massachusetts male ageing study. *J Clin Endocrinol Metab* 2002; 87: 589-598.
 16. Araujo B, Esche R, Kupelian V, O'Donnell B, Travison G, Williams E, et al. Prevalence of symptomatic androgen deficiency in men. *J Clin Endocrinol Metab* 2007; 92: 4241-47.
 17. Harman SM, Metter EJ, Tobin JD, Blackman MR, Pearson J. Longitudinal effects of aging on serum testosterone and FT in healthy men. *J Clin Endocrinol Metab* 2001; 86: 724-731.
 18. Goel A, Kumar S, Natsu SM, Dalela D, Sinha RJ, Awasthi S. A cross-sectional pilot study to determine the prevalence of testosterone deficiency syndrome in working population of Indian men. *Ind J Urol* 2009; 25: 190-4.
 19. Orwoll S, Nielson M, Labrie F, Connor E, Cauley A, Cummings R, et al. Evidence for geographical and racial variation in serum sex steroid levels in older men. *J Clin Endocrinol Metab* 2010;95: 151-160.
 20. Heald AH, Ivison F, Anderson SG, Cruickshank K, Laing I, Gibson JM. Significant ethnic variation in total and free testosterone concentration. *Clin Endocrinol (Oxf)* 2003; 58: 262-6.
 21. Khan MT, Akhtar T, Niazi M. Prevalence of anemia among university of Peshawar students. *JPMI* 2010; 24: 265-269.
 22. Usman K, Syed ZA, Rao AA. Reference range values of haematological parameters in healthy Pakistani adults. *Pak J Physiol* 2007; 3: 19-22.
 23. Beutler E, Waalen J. The definition of anemia: what is the lower limit of normal of the blood hemoglobin concentration? *Blood* 2006;107:1747-1750.
 24. Yeap BB, Berlin J, Shi Z, Mathew W, Knuiman MW, Olynyk JK, et al. Serum testosterone levels correlate with hemoglobin in middle aged and older men. *Int Med J* 2009; 39: 532-8.
 25. Rao P, Mada S, Erukulapathi R, Jones S. Anemia leading to diagnosis of pan-hypopituitarism in an elderly gentleman. *Endocrine Abstracts* 2009; 19: 248.
 26. Willoughby SD, Wilborn C, Taylor L, Campbell W. Eight weeks of aromatase inhibition using the nutritional supplement Novedex XT: Effects in young, eugonadal men. *Int J Sport Nutr Exerc Metab* 2007; 17: 92-108.
 27. Rochira V, Zirilli L, Madeo B, Maffei L, Carani C. Testosterone action on erythropoiesis does not require its aromatization to estrogen: Insights from the testosterone and estrogen treatment of two aromatase-deficient men. *J Steroid Biochem Mol Biol* 2009;113: 189-94.
 28. Ferrucci L, Maggio M, Bandinelli S, Basaria S, Lauretani F, Ble A, et al. Low testosterone levels and the risk of anemia in older men and women. *Arch Intern Med* 2006; 166:1380-88.

Evaluation of Serum Triglyceride and Cholesterol in Subclinical Hypothyroidism

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ABSTRACT

Objective: This study was aimed to evaluate the effects of subclinical hypothyroidism on lipid profile with special reference to total cholesterol and triglyceride levels.

Study Design: Analytic study

Place and Duration Study: This study was carried out at the Punjab Institute of Nuclear Medicine (PINUM), Faisalabad and IMBB, university of Lahore from January 2011 to September 2011. (Eight months)

Materials and Methods: 100 female patients of age ranges from 20-50 years having subclinical hypothyroidism (SCH) and 20 euthyroid subject of same age and sex (control) were included in this study. Serum FT₄, FT₃, TSH, total cholesterol and triglyceride of subclinical hypothyroid patients and control group were determined.

Result: In subclinical hypothyroid patients total cholesterol were significantly increased as compared to euthyroid group. Serum TSH and total cholesterol showed positive correlation. Serum triglyceride did not significantly increased in SCH.

Conclusion: The total cholesterol level elevated in SCH. This increases the risk of atherosclerotic coronary artery disease (CAD) in subclinical hypothyroid patients.

Key Words: Subclinical hypothyroidism (SCH), Free thyroxine (FT₄), Free triiodothyronine (FT₃), Thyroid stimulating hormone (TSH), Cholesterol, Triglyceride

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INTRODUCTION

Subclinical hypothyroidism is defined as increased Thyroid Stimulating hormone (TSH) levels from normal reference range but free thyroxine (FT₄) levels and triiodothyronine (T₃) levels are within normal range¹.

Subclinical hypothyroidism is also defined with serum TSH concentration above the clinically defined limits of the reference range when serum free T₄ (FT₄) concentration is within its reference range. The Third National Health and Nutrition Examination Survey², who examined the serum TSH value in a "disease free" subset (n = 13344) of an ethnically diverse reference population, aged 12 years and older. This selected population showed, the normal serum TSH in between 0.45mIU to 4.12mIU. The reference range varied with age, sex and ethnic groups but as the differences were small, there was no need to adjust the reference value.

The reference range of normal serum TSH concentration was 0.45mIU to 4.5m IU/L and FT₄ concentration is 0.8mg/dL to 2.0 mg/dL¹.

Patients showed few or no definite clinical signs or symptoms of hypothyroidism with subclinical form.

The subclinical hypothyroidism is based on laboratory diagnosis³.

Subclinical hypothyroid patients having an elevated TSH level showed value of TSH lower than 10 m IU/L in 75%. About 20% patient were taking thyroid medications having subclinical hypothyroidism⁴.

The progression from subclinical hypothyroidism to overt hypothyroidism was 2% to 5%. The overt hypothyroidism may be defined as a low serum FT₄ concentration with elevated serum TSH concentration^{5,6}.

In individuals who were not taking thyroid hormone treatment, serum TSH returned to normal after 1 year of follow-up in approximately 5% but remained elevated in the remainders⁵.

It was observed that an elevated thyrotropin level was associated with higher serum cholesterol level and LDL-cholesterol^{7,8}.

Patient with subclinical hypothyroidism have a high rate of progression to overt, symptomatic hypothyroidism⁹.

Subclinical hypothyroid patients show elevated total cholesterol, total triglyceride, LDL-cholesterol but decreased HDL- cholesterol. This increases the risk of developing atherosclerosis.¹⁰

There was significant reduction in total cholesterol and LDL-cholesterol levels with L-thyroxine treatment in patient with subclinical hypothyroidism.¹¹

There was linear and significant increase in total cholesterol, triglyceride and LDL-cholesterol with

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increasing TSH. HDL-cholesterol also showed linear decrease with TSH increase.¹²

The prevalence of subclinical hypothyroidism and its association with coronary heart disease was studied. This showed no association between cardiovascular mortality and subclinical hypothyroidism.¹³

The CAD and mortality due to CAD is more in subjects with higher TSH level ($> 10 \text{ mU/L}$). This risk increases by increasing TSH. Subclinical hypothyroid patients showed increased risk of CAD in comparison to euthyroid subjects.¹⁴

It was observed that thyroid dysfunction were more common in women. The serum cholesterol and triglycerides levels were found elevated in hypothyroid patients.¹⁵

Thyroid hormones affect lipid metabolism. In Subclinical hypothyroidism & overt hypothyroidism, the increased cholesterol levels are important risk factor in developing coronary heart diseases.¹⁶

Total cholesterol and HDL-C were significantly higher in females in a gender specific comparison in Subclinical hypothyroid patients. SCH were more common in female.¹⁷

MATERIALS AND METHODS

This study was conducted at Punjab Institute of Nuclear Medicine, Faisalabad. Two groups A and B were included in study. Group "A" included the 100 female patients of SCH with age range from 20-50 years diagnosed on the basis of history, clinical examination and relevant laboratory findings from PINUM OPD.

The second group "B" comprised of 20 normal euthyroid subjects of same age and sex as in group A having normal FT₃, FT₄ and TSH for comparison.

Measurement of TSH: The serum thyroid stimulating hormone (TSH) was determined quantitatively by enzyme immunoradiometric assay method, using commercially available kit (TSH IRMA kit) by Beckman Coulter¹⁸.

We added the 100 ml of calibrator, control or sample and 100 ml of tracer to coated tubes and mixed.

Then added the 100 ml of tracer to two additional tubes. We incubated the content for one hour at $18-25^{\circ}\text{C}$ after shaking (280 rpm). After that we aspirated the contents of tubes except 2 tubes containing tracer only and washed twice with 2 ml of wash solution.

Finally counted bound cpm (B) and total cpm (T) for 1 min. Results were obtained from standard curve by interpolation. The curve serves for the determination of TSH concentration in samples measured at the same time as the calibrators.

Measurement of Serum FT₄: Serum thyroxine (FT₄) was determined quantitatively by radio immunoassay technique, using commercially available kit (FT₄ RIA Kit) by Beckman coulter¹⁹.

We added 25 ml of calibrator or sample, 400 ml of tracer and 100 ml of ligand to coated tubes successively and then mixed. Also added 400 ml of tracer to two additional tubes to obtain total CPM.

Then incubated for 60 min at $18-25^{\circ}\text{C}$ with shaking (350 rpm). We aspirated the contents of tube except two tubes containing 400 ml of tracer only. At last we counted the bound cpm (B) and total com (T) for 60 minutes.

Results were obtained from the standard curve by interpolation. The curve serve for the determination of FT₄ concentration in samples measured at the same time as the calibrator.

Measurement of Serum FT₃: Serum triiodothyronin (FT₃) was determined quantitatively by radioimmunoassay technique using commercially available kit (FT₃ RIA Kit) by Beckman coulter¹⁹.

We added 100 ml of calibrator or sample and 400 ml of tracer to coated tubes successively and then mixed. Also added 400 ml of tracer to two additional tubes to obtain total CPM.

Then incubated for 120 min at $18-25^{\circ}\text{C}$ with shaking (350 rpm). We aspirated the contents of tube except two tubes containing 400 ml of tracer only. At last we counted the bound CPM (B) and total com (T) for 60 minutes.

Results were obtained from the standard curve by interpolation. The curve serve for the determination of FT₃ concentration in samples measured at the same time as the calibrator.

Serum Cholesterol: Total cholesterol will be estimated by CHOD PAP Method^{20,21} by using spectrophotometer. The commercially available kit for determination of cholesterol by DiaSys was used. The standard laboratory procedure and instruction of the manufacturer were observed.

Serum Triglycerides: Triglyceride will be determined by GPO-PAP Method^{22,23} by using spectrophotometer. The commercially available kit for determination of triglyceride by DiaSys was used. The standard laboratory procedure and instruction of the manufacturer were observed.

Statistical Analysis: Results are expressed as mean \pm SD. T-test was applied for comparison of cholesterol and triglyceride, TSH, FT₃, FT₄ between subclinical hypothyroid patients and euthyroid subjects. Pearson's correlation was used to establish correlation between TSH and cholesterol & triglyceride. The statistical program used was SPSS²⁴. $P < 0.05$ was considered statistically significant.

RESULTS

Subclinical hypothyroid patients showed significantly elevated TSH levels as compared to euthyroid subjects ($P < 0.05$). The value of TSH in subclinical

hypothyroid patients were higher than the reference value.

The cholesterol level of subclinical hypothyroid patients was significantly higher ($P < 0.05$) compared to that of euthyroid group and was greater than the reference value. The subclinical hypothyroid patients showed insignificant increase in triglyceride ($P < 0.05$).

Table No.1: Statistical analysis and t-test of Cholesterol, Triglycerides, FT₄, FT₃ and TSH in subclinical hypothyroid and euthyroid subject (control)

Parameters	Group	Mean \pm SD	P. Value
Cholesterol	Sub clinical Hypothyroidism	222.11 \pm 28.968	0.000*
	Control	140.30 \pm 15.698	
Triglyceride	Sub clinical Hypothyroidism	118.26 \pm 17.060	0.77 ^{NS}
	Control	111.05 \pm 13.012	
FT ₄	Sub clinical Hypothyroidism	14.545 \pm 2.582	0.000*
	Control	17.214 \pm 2.235	
FT ₃	Sub clinical Hypothyroidism	3.267 \pm 0.5935	0.001*
	Control	3.900 \pm 0.733	
TSH	Sub clinical Hypothyroidism	10.595 \pm 6.270	0.000*
	Control	1.453 \pm 0.698	

*Significant as $P < 0.05$

NS = Non significant

The results of Cholesterol, Triglycerides, FT₄, FT₃ and TSH are given in table 1 as mean \pm SD and P value in subclinical hypothyroid and euthyroid subjects.

The average of cholesterol in patients of subclinical hypothyroidism was 222.11 \pm 28.968 mg/dl and average of cholesterol in control group was 140.30 \pm 15.698 mg/dl. There is significant difference of cholesterol level in both groups. ($p < 0.05$)

The average of triglycerides in patients of subclinical hypothyroidism was 118.26 \pm 17.060 mg/dl and average of triglycerides in control group was 111.05 \pm 13.012 mg/dl. There is insignificant difference of triglycerides level in both groups. ($p < 0.05$)

The average of FT₄ in patients of subclinical hypothyroidism was 14.545 \pm 2.582 pmol/L and average of FT₄ in control group was 17.214 \pm 2.235 pmol/L. There is significant difference of FT₄ level in both groups within normal limits. ($p < 0.05$)

The average of FT₃ in patients of subclinical hypothyroidism was 3.267 \pm 0.5935 pmol/L and average of FT₃ in control group was 3.900 \pm 0.733 pmol/L. There is significant difference of FT₃ level in both groups within normal limits. ($p < 0.05$)

The average of TSH in patients of hypothyroidism was 39.198 \pm 14.732 mIU/L and average of TSH in control group was 1.508 \pm 0.643 mIU/L. There is significant difference of TSH level in both groups. ($p < 0.05$).

There is a significant positive correlation between TSH and cholesterol in subclinical hypothyroid

patients i.e. with increase of TSH level, the level of cholesterol also increases.

The FT₄ showed insignificant negative correlation with cholesterol. The decreased level of FT₄ showed insignificant elevated cholesterol.

There is insignificant positive correlation between TSH and triglycerides in subclinical hypothyroid patients.

The FT₃ showed insignificant negative correlation with cholesterol and insignificant positive correlation with triglyceride.

Table No.2: Correlation between TSH, FT₄, FT₃ and LDL & HDL in subclinical Hypothyroidism

	Cholesterol	Triglyceride
TSH		
Pearson	0.544**	0.055
Correlation		
Sig (2 tailed)	0.000	0.587
FT ₄		
Pearson	--0.066	-0.264
Correlation		
Sig (2 tailed)	0.512	0.108
FT ₃		
Pearson	-0.055	0.022
Correlation		
Sig (2 tailed)	0.589	0.828

*=Correlation is significant at the 0.05 level $P < 0.05$

** = Correlation is significant at the 0.01 level $P < 0.05$

DISCUSSION

The present research work was aimed to check the significance of cholesterol and Triglyceride, FT₄, FT₃ and TSH levels in diagnosed patients of subclinical hypothyroidism. One hundred subclinical hypothyroid patients (Group A) enrolled in this study along with twenty euthyroid subjects (Group B) for comparison.

In the present research significant difference ($P < 0.05$) was found in cholesterol of euthyroid subjects (control) and subclinical hypothyroid patients. The cholesterol is higher (222.11 \pm 28.968) in subclinical hypothyroid patients as compared to euthyroid (140.30 \pm 15.598)

The Triglyceride level in subclinical hypothyroid patients also insignificantly higher (118.26 \pm 17.060) as compared to control (111.05 \pm 13.012).

The finding of present research had correlation with the past work of Asvold who observed the linear and significant increase in serum cholesterol, LDL-cholesterol and Triglyceride with increasing TSH.¹²

It was observed that LDL cholesterol and total cholesterol level were higher in subclinical hypothyroid patient²⁵. The elevation in serum cholesterol and LDL-cholesterol was associated with the increase in TSH.⁴ This support the findings of present study.

The results contradict with the conclusion by Diekman, that there was no significant decrease in total

cholesterol and LDL-C after replacement therapy with L-thyroxine in SCH patients²⁶.

The results obtained by Hueston and Pearson favour the results of present research i.e. SCH have higher total cholesterol and triglyceride²⁷.

In present study higher TSH level in subclinical hypothyroidism showed positive significant correlation with Cholesterol. The higher Cholesterol level may be responsible for atherosclerotic coronary artery disease.

CONCLUSION

It was concluded through the present study that cholesterol increased in subclinical hypothyroidism. This may lead to atherosclerotic cardiac disease.

REFERENCES

1. Surks MI., Ortiz E, Daniels GH, Sawin CT, Col NF, Cobin RH, et al. Sub clinical thyroid disease. *J Am Assoc* 2004;29(12):228-38.
2. Hollowell JG, Stachling NW, Flanders WD. Serum TSH, T4 and thyroid antibodies in the United States Population (1988 to 1994); National Health and Nutrition Examination Survey (NHANES III). *J Clin Endocrinol Metab* 2002;87: 489-99.
3. Spencer CA, Takeuchi M, Kazarosyan M. Current status and performance goals for serum thyrotropin (TSH) assay. *Clin Chem* 1996;42: 2051-52.
4. Canaris GJ, Manowitz NR, Mayor G, Ridgway EC. The Colorado thyroid disease prevalence study. *Arch Intern Med* 2000;160:526-34
5. Parle JV, Franklyn JA, Cross KW, Jones SC, Sheppard MC. Prevalence and follow up of abnormal thyrotropin (TSH) concentrations in the elderly in the United Kingdom. *Clin Endocrinol (Oxf)* 1991;34:77-83.
6. Sawin CT. Sub-clinical hypothyroidism in older persons. *Clin Geriatr Med* 1995;11:231-38.
7. Danese MD, Landeson PW, Meinert CL, Powe NR. Effect of thyroxine therapy on serum lipoproteins in patients with mild thyroid failure; a quantitative review of the literature. *J Clin Endocrinol Metab* 2000;85:2993-3001.
8. Kanaya A, Harris F, Olpatov SV. Association between thyroid dysfunction and total cholesterol level in an older biracial population. *Arch Int Med* 2002;162: 773-79
9. Vanderpump MP, Tunbridge WM, French JM, Appleton D, Bates D, Clark F, et al. The incidence of thyroid disorders in the community: a twenty year follow up of the Wickham Survey. *Clin Endocrinol (Oxf)* 1995;43:55-68.
10. Kung AW, Janus ED. Thyroid dysfunction in ambulatory elderly Chinese Subjects in an area of borderline iodine intake. *Thyroid* 1996;6:111- 114
11. Meier C, Staub JJ, Roth CB. TSH-controlled L thyroxine therapy reduces cholesterol levels and clinical symptoms in subclinical hypothyroidism: a double blind, placebo controlled trial (Basel Thyroid Study). *J Clin Endocrinol Metab* 2001; 86:4860-66
12. Asvold OB, Lars JV, Nilsen IL, Trine B. The association between TSH within the reference range and serum lipid concentration in a population based study. The HUNT study. *Eur J Endocrinol* 2007;156(2):181-6.
13. Sgarbi JA, Matsumura LK, Kasamatsu TS, Ferreira SR, Maciel RM. Subclinical thyroid dysfunctions are independent risk factors for mortality in a 7.5-year follow up. *Eur J Endocrinol* 2010;162(3):569-77.
14. Rodondi N, Elzen WPD, Bauer DC, Cappola AR, Razvi S, Walsh JP, et al Sub clinical hypothyroidism and risk of coronary artery disease and mortality. *JAMA* 2010;304(12):1365-74.
15. Mittal A, Sathian B, Kumar A, Chandrasekharan N, Dwedi S. The clinical implications of thyroid hormones and its association with lipid profile: A comparative study from Western Nepal. *Nepal J Epidemiol* 2010;1(1):11-16.
16. Mahajan RD, Singh R. Thyroid dysfunction and total cholesterol-experience in a tertiary care hospital. *R J P B C S* 2011; 2(2):268-273.
17. Lai CC, Tang SH, Pei D, Wang CY, Chen YL, Wu CZ, et al. The prevalence of subclinical thyroid dysfunction and its association with metabolic syndrome in Taiwanese Elderly. *Int J Gerontol* 2011;5:25-29.
18. Helenius T, Tikanoja S. A sensitive and practical immunoradiometric assay of thyrotropin. *Clin Chem* 1986;32(3):514-18.
19. Ellis SM, Ekins RP. The radioimmunoassay of serum free triiodothyronine and thyroxine. In: Pasternak CA, editor. *Radioimmunoassay in Clinical Laboratory Biochemistry*. London: Heyden;1976.p.187-94.
20. Deeg R, Ziegenhorn J. Kinetic enzymatic method for automated determination of total cholesterol in serum. *Clin Chem* 1983;1798-802
21. Artiss JD, Zak B. Measurement of cholesterol concentration. In: Rifai N, GRWarnick and MH Dominiczak eds. *Handbook of lipoprotein testing*. Washington: AACC Press 1997 ;P. 99-114.
22. Cole TG, Klotzsch SG, McNamara J. Measurement of triglyceride concentration. In: Rifai N, Warnick GR, Dominiczak MH, editors. *Handbook of lipoprotein testing*. Washington: ACC Press;1997.p.115-26.
23. Rifai N, Bachorik PS, Albers JJ. Lipids, lipoproteins and apolipoproteins In: Burtis CA, Ashwood ER, editors. *Tietz Textbook of Clinical*

- Chemistry. 3rd ed. Philadelphia: WB Saunders Company; 1999.p.809-61.
24. Steel RGD, Torrie JH. Principles and Procedures of statistics: A Biometrical Approach. 2nd ed. McGraw Hill International Book Company, Auckland New Zealand;1982; 82-86.
25. Sundaram V, Hanna AN, Koneru L, Newman HAI, Falko JM. Both hypothyroidism and hyperthyroidism enhance low density lipoprotein oxidation. J Clin Endocrinol Metab 1997;82: 3421-3424.
26. Diekman T, Lansberg PJ, Kastelein JJP, Wiersinga WM. Prevalence and correction of hypothyroidism in a large cohort of patients referred to dyslipidemia. Arch Intern Med 1995; 155(14):1490-1495.
27. Hueston WJ, Pearson WS. Sub-clinical hypothyroidism and risk of hypercholesterolemia. Annals of Family Med 2004;2(4):351-355.

Hyper – Prolactinemia in Subfertile Women

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ABSTRACT

Objective: To determine the frequency of Hyperprolactinemia in subfertile women presenting to Nishtar Hospital Multan.

Study Design: Case series study.

Place and Duration of Study: This study was carried out in Gynae and Obst. Outpatient Department and Gynae and Obst. Units of Nishtar Hospital, Multan from Oct. 2009 to March 2010.

Material and Methods:- A total of 111 Patients with subfertility were selected which were fulfilling inclusion criteria.

Results: The prevalence of HPR in subfertile women at Nishtar Hospital Multan is 31.53%, and it is more common in women with primary subfertility i.e. 23.42% than in secondary subfertility where it is 8.10%.

Conclusion:- It is concluded that hyperprolactinemia(HPR)leads to anovulation which is a main cause of subfertility, more common among women with primary subfertility than secondary subfertility.

Key Words: Hyperprolactinemia, Female Subfertility, Prolactin, Anovulation

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INTRODUCTION

Subfertility is the failure of conception after at least 12 months of regular, unprotected intercourse¹. Based on this 60-80 millions couples all over the world can be labelled as suffering from subfertility².

The prevalence of subfertility in industrialized countries has been quoted as 20% and seems to be on the rise³. About 84% couples who have regular sexual intercourse and who do not use contraception, conceive within a year, while about 92% couples that are trying to conceive will do so within 02 years⁴. Couples with primary subfertility have never been able to conceive⁵.

Subfertility because of its medical, social and psychological implications, is a serious problem. Recent advancements have increased the possibility of success in the treatment of subfertility. But the peak human fertility i.e. the chance of pregnancy per menstrual cycle in the most fertile couples, is no higher than 33%, so it is unrealistic to expect a higher chance of pregnancy than this from any fertility treatment⁶. However prediction models for spontaneous pregnancy have been developed which can select subfertile couples that have good prospects, who can be expectantly managed⁷. Delay in child bearing and the adverse effect of the age on women's fertility have increased referrals for sub-fertility investigations and treatment. In the past 25years, the percentage of births to women age 30 years or above in England and Wales have doubled⁸. About one in six

couples in the U.K require referral for investigation and treatment for subfertility⁹.

There are many biological causes of subfertility some of which may be bypassed with medical intervention¹⁰. Latest figures on subfertility causes in couples in which the women is under 25 years of age, are 40% female, 23% male, 17% combined and 10% unexplained¹¹. About 15% couples actually have more than one causes of subfertility¹².

As a result of public awareness about subfertility and its treatment options available, more and more couples are expected to seek treatment for the condition¹³.

MATERIALS AND METHODS

This case series study was conducted in Gyn/obs outpatient department and Units of Nistar Hospital, Multan from March 2008 to September 2008. A total of 111 Patients with subfertility were selected which were fulfilling inclusion criteria, from the Gynae Outpatient Department or Gynae Units of Nishtar Hospital Multan. Relevant data of cases including personal data, presenting complaints, type of subfertility and mode of admission were recorded. We measured serum prolactin level of all selected women.

RESULTS

This study determines the frequency of HPR in subfertile women presenting to Nishtar Hospital Multan. A total of 111 women were included in this study, out of these 72 women were with primary subfertility and 39 with secondary subfertility. All cases have age limit of 19-39 years, with majority aged 20-35 years(80%). 88 women presented in Gynae Outpatient Department and 23 women were admitted in Gynae

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Units of Nishtar Hospital Multan. Serum prolactin level were more than 25µg/L in 35 women (31.5%), 26 women with primary subfertility (23.4%) and 9 women with secondary subfertility (8.1%). Among women with HPR, 7 women had regular menstrual cycle (20%), while 28 women presented with menstrual irregularities (80%), 22 women had oligomenorrhea (65%) and 4 women had galactorrhea (12%). The prevalence of HPR in subfertile women at Nishtar Hospital Multan is 31.53%, and it is more common in women with primary subfertility i.e. 23.42% than in secondary subfertility where it is 8.10%.

Table No.1: Age Distribution (n=111)

Age (years)	No. of patients	%age
19-25	27	24.3
26-30	34	30.5
31-35	28	25.2
36-39	22	20.0

Table No.2: Frequency of hyperprolactinemia in primary and secondary subfertility (n=111)

	Subfertile women	Primary	Secondary
No.	111	72	39
Serum prolactin >25µg/L	35	26	09

Table No.3: Percentage of hyperprolactinemia in primary and secondary subfertility (n=111)

Type of Subfertility	Cases	Women with serum prolactin >25µg/L	%age
Primary	72	26	23.4
Secondary	39	09	08.1
Total	111	35	31.5

Table No.4: Mean age at presentation among women with primary and secondary subfertility

Type of subfertility	Mean age at presentation (Years)
Primary	26.1
Secondary	32.1

DISCUSSION

Subfertility is a socio-medical problem faced by 15-25% of married population varying in different areas of world. Female factors as well as male factors play a significant role and their treatment accordingly is more successful and cost effective¹⁴.

Evaluation of serum prolactin level is useful in the management of female subfertility¹⁵. Excess prolactin level decreases secretion of GnRH from hypothalamus and FSH, LH from the pituitary gland resulting in decrease secretion of estrogen and progesterone in the ovary which may manifest clinically as oligomenorrhea, amenorrhoea, galactorrhea or subfertility.

During present study period total number of 111 women with history of subfertility, either primary or

secondary, were included and their serum prolactin levels measured. Serum prolactin level were more than 25µg/L in 35 women (31.5%), 26 women with primary subfertility (23.4%) and 9 women with secondary subfertility (8.1%). Among women with HPR, 7 women had regular menstrual cycle (20%), while 28 women presented with menstrual irregularities (80%), 22 women had oligomenorrhea (65%) and 4 women had galactorrhea (12%). This study has illustrated that HPR is one of the causes of anovulatory subfertility. Majority of women in present study were with primary subfertility and with menstrual disorders. HPR adversely affects fertility potential by impairing GnRH pulsatility and thereby ovarian function.

A comparatively high prevalence of irregular menstruation, acne and polycystic ovarian syndrome may reflect higher prevalence of HPR in primary subfertility. High concentrations of FSH have been observed to be associated with subfertility. It is reported that decrease in the level of gonadotrophins in women with HPR¹⁶, which leads to anovulatory subfertility. Another study also showed that women with hyperprolactinemia have decreased levels of FSH and LH due to decrease secretion of GnRH from hypothalamus, which in turn leads to decrease secretion of estrogen and progesterone in the ovary, manifesting clinically as oligomenorrhea, amenorrhea, galactorrhea or subfertility¹⁷.

Bevan et al suggest that decline in gonadotrophins in hyperprolactinemic women indicates an association between gonadotrophin deficiency and hyperprolactinemia¹⁸. Their view is that this may be an indirect sign of functional hypothalamic pituitary interruption due to inhibitory effect of prolactin on gonadotrophins release.

Rolland et al also observed low estradiol secretion in hyperprolactinemic women which in turn leads to impaired follicular growth and results in subfertility¹⁹.

Morris et al reported 24% infertility hyperprolactinemic women and 27% quoted in an Indian study²⁰.

According to a study, it has been suggested that hypogonadism seen in hyperprolactinemic women is due to the high circulating levels of prolactin interfering with the action of the gonadotrophins at the ovarian level and impairing normal gonadal steroid secretion, which in turn alters positive feedback at the hypothalamic and pituitary levels²¹. This leads to lack of gonadotrophin cyclicity and to infertility.

Yamaguchi et al found decreased LH secretion in hyperprolactinemic women²². Uilenbroek and Linden reported that prolactin can have a direct inhibitory effect on follicular estradiol production²³. This might contribute to the reduced fertility seen in women with hyperprolactinemia.

Ben-David and Schenker reported that transient hyperprolactinemia at midcycle might disturb fertilization and embryo implantation²⁴.

It is suggested from all above studies that any alteration in HPG-Axis contributes to abnormal prolactin secretion and hyperprolactinemia due to any cause

leads to altered gonadotrophins secretion, affecting ovarian function and resulting in subfertility.

In a prospective study, serum prolactin level were checked in women at the time of the couple initial consultation for subfertility²⁵. There were 1.77% (15 out of 844 women) with elevated levels of prolactin. In our study the prevalence of HPR was 31.5% which is higher than the study in USA. In a study conducted at California in July 2005, 48% women with hyperprolactinemia had subfertility²⁶.

Results of a study showed that HPR is found in 64.91% of women with primary subfertility and 35.09% of women with secondary subfertility²⁷.

The prevalence of HPR in subfertile women were studied in different parts of world, it was higher in Iraq i.e. 60%²⁸, while in Hyderabad, India have prevalence of HPR 41% in subfertile women.

CONCLUSION

On the basis of this study, it is concluded that hyperprolactinemia leads to anovulation which is a main cause of subfertility, more common among women with primary subfertility than secondary subfertility. As fertility can be restored in these women by treating them with dopamine agonist which can normalize prolactin level and permit ovulation. So, serum prolactin level should be checked in all women presenting with subfertility.

REFERENCES

1. Anderson RA Irvine S. Disorders of male reproduction. In: Shaw RW, Soutter WP, Stanton SL editors. Gynaecology. 3rd ed. Edinburgh: Churchill Living Stone; 2003.p.295-315.
2. Fathalla MF. Reproductive Health. A Global Overview. Early Human Development 1992;29: 35-42.
3. Alan SP. Contemporary Office Based Evaluation and Treatment. Obstet Gynecol Clin N Am 2000; 27: 651-5.
4. About Infertility And Fertility Problems.[on line] cited on 2009-07-14. Available from: URL:http://www.hfea.gov.uk/ency.
5. Medline Plus Medical Encyclopedia: Infertility [on line] cited on 2009-7-14. Available from: URL:http://www.nlm.nih.gov/medline plus/ency.
6. Cahill DJ, Wardle PG. Management of infertility. BMJ 2002;325: 28-32.
7. Van der Sterg JW, Steures P, Eijkemaus MJ. Pregnancy is predictable: prediction Human Reprod 2007; 22: 536-42.
8. Kapur N. Management of Self Harm in adult. Br J Psychiatry 2005 187: 497-9.
9. Infertility Help. When and where to get help for Fertility Treatment. [on line] cited on 2009-07-
14. Available from: URL: http:// www.hfea.gov.uk/ency.
10. Makar RS, Toth TL. The Evaluation of Infertility. Am J Clin Pathol 2002;117 Suppl:S95-103.
11. 2000 Assisted Reproductive Technology Success Rates. MMWR 2003;52:1-14.
12. Snick HK, Snick TS, Evers JL. The Spontaneous Pregnancy Prognosis in Untreated Subfertile Couples. Human Reprod 1997;12:1582-8.
13. Pal L, Santoro N. Age Related Decline In Fertility Endocrinol Metab Clin N Am 2003; 32: 669-88.
14. Sandlow J. Shattering the myths about male infertility. Postgraduate Med 2000;107:234-45.
15. Melmed S, Kleinberg D. Anterior pituitary. In: Kronenberg HM, Melmed S, Polonsky KS, Larsen PR, editors. Williams Textbook of Endocrinology. 11th ed. Philadelphia: Saunders Elsevier;2008.p.8.
16. Tjeerdsma G, Sluiter WJ, Hew JM. Hyperprolactinemia is associated with a high prevalence of pituitary-adrenal dysfunction in non-functioning pituitary macroadenoma. Eur J Endocrinol 1996; 135:209-308.
17. Jacquier S. Male Infertility. Br J Obstet Gynaecol 1993; 100: 612-4.
18. Bevan JS, Webster J, Burke CW. Dopamine agonists and pituitary shrinkage. Endocr Rev 1992; 13: 220-40.
19. Rolland R, Lequin RM, Seheelekens LA. The role of prolactin in the restoration of ovarian function during the early post-partum period in the human female. Clin Endocr 1975; 4: 15-25.
20. Morris RS, Sauer MV. New advances in the treatment of infertility in women with ovarian failure. Curr Opin Obstet Gynecol 1993;5:368-77.
21. Thorner MO, Besser GM. Recent advances in endocrinology and metabolism. 1st edition. Churchill Living Stone: Edinburg;1978.p.6-8.
22. Yamaguchi M, Aono T, Koike K. Effect of nocturnal hyperprolactinemia on ovarian luteal function and galactorrhea. Eur J Obstet Gynecol Rep Bio 1991; 39: 187-91.
23. Uilenbroek J, Linden RV. Effect of prolactin on follicular estradiol production. J Endocrinol 1984; 102: 245-50.
24. Olivar AC, Chaffkin LM, Kates RJ. Is it necessary to obtain serum levels of thyroid stimulating hormone and prolactin in asymptomatic women with infertility? Conn Med 2003;67:393-5.
25. Razzak AH, Wais SA. The infertile couple. East Mediterr Health J 2002; 8: 234-8.
26. Bayrak A, Saadat P, Mor E. Pituitary imaging is indicated for the evaluation of hyperprolactinemia. Fertil Steril 2005;1:81-5.
27. Kalsum A, Jalali S. Role of hyperprolactinemia in infertility. Pak J Med 2002;31:3.
28. Prathibha D, Govardhani M, Krishma PT. Prolactin levels in infertility.J Ind Med Assoc 1994;92:397-9.

Microalbuminuria in Diabetes Mellitus Type 2: Association with Age, Sex, and Body Mass Index: A Cross Sectional Study

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ABSTRACT

Objective: This study was aimed to determine the association of microalbuminuria with age gender, body mass index (BMI) and duration of type 2 diabetes mellitus (T2DM).

Study Design: Prospective Cross sectional.

Place and Duration of study: This study was carried out at District Head Quarter Hospital Mirpur Azad Kashmir from July 2011 and June 2012.

Materials and Methods: This study included 300 patients (199 females and 101 males) with T2DM of duration of six months to 43 years. The evaluation included structured questionnaires clinical, neurological examinations and laboratory tests. Negative for albumin in urine by albustic method and micral tests were used for estimation and categorization of microalbuminuria.

Results: Chi square test revealed statistical significant association of microalbuminuria with age ($p < 0.015$) blood sugars random ($p < 0.015$) but no statistical significant association with gender, weight, and old & new diabetics. One sample t test had shown statistical significant association of degree of microalbuminuria with BMI ($p < 0.001$), cholesterol ($p < 0.001$) and numbers of years of diabetes ($p < 0.050$)

Conclusion: In type 2 diabetic statistical significant associations has shown between degree of microalbuminuria, age, blood sugars, cholesterol, body mass index and duration of diabetes mellitus

Key Words: Microalbuminuria, T2diabetes, cholesterol, random blood sugars, body mass index

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INTRODUCTION

Microalbuminuria is defined by a urinary albumin excretion (UAE) rate higher than normal but lower than $200\mu\text{g}/\text{min}$. This is measured by standard laboratory methods,¹⁻³ in the absence of urinary tract infection and acute illness. Albumin excretion in healthy individuals ranges from $1.5\text{--}20\mu\text{g}/\text{min}$.^{4,5} Microalbuminuria precedes the overt diabetic nephropathy by 10–14 years which can be reversed by therapeutic intensified glycemic control and use of ACE inhibitors. Microalbuminuria can be diagnosed by measuring albumin excretion rate during 24 hours or in an overnight urine collection. UAE in the morning for screening, and overnight are best choice for monitoring microalbuminuria. In type-2 diabetes mellitus (T2DM) prevalence of microalbuminuria is the strong predictor of diabetic nephropathy (DN). In addition to DN microalbuminuria is main cause of morbidity and mortality in both types of diabetes mellitus (DM).⁶⁻⁸ Diabetic having microalbuminuria has increased

prevalence of arterial hypertension, proliferative retinopathy,⁹ peripheral neuropathy and diabetic nephropathy.¹⁰ Our study has established relationship of degree of microalbuminuria with body mass index (BMI), cholesterol, and duration of diabetes. Statistical significant gender association of microalbuminuria was not seen in T2DM. This study was aimed to determine the association of microalbuminuria between type-2 diabetic patients and age, sex, duration of diabetes, body mass index and biochemical parameters in comparison to earlier studies.¹⁰⁻¹¹

MATERIALS AND METHODS

This study was carried out between July 2011 and June 2012, to investigate the association between microalbuminuria and risk factors. Study was approved by the ethics committee. Outpatient were screened for eligibility. Three hundred patients with T2DM of duration (Mean \pm SD, 31.6 ± 12.7 years) and negative for albumin in urine by albustic method were included in the study. Patients with overt albuminuria ($>350\text{ mg}/\text{day}$), bed ridden patients for more than two weeks, congestive cardiac failure, urinary tract infection, pregnant ladies, metal poisoning, connective tissue disorders, and chronic NSAIDs use were excluded. The

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history, physical examination and neurological examination were done in each case. Body mass index (BMI) was calculated from the height and weight measurements of the patients. Routine investigations and serum creatinine were done in all patients. Micral test-strip method color reaction is mediated by an antibody-bound enzyme.¹² was used for estimation of microalbuminuria.

Morning mid-stream urine samples were collected and strip was immersed for five seconds in sterile container. Microalbuminuria was graded as mild (20–50 mg/L), moderate (50–100 mg/L), or severe (100–300 mg/L) depending on the color change in the strip and test was repeated twice in order to avoid bias.

Data was analyzed by utilizing SPSS 20. Quantitative data was expressed as mean \pm SD and chi-square tests were done where appropriate. One sample t test was used to analyze the association of microalbuminuria with, BSR, cholesterol, BMI and duration of diabetes. Probability (P) value < 0.05 was regarded as statistically significant.

RESULTS

A total of 300 patients having microalbuminuria were included in our study. Out of 300 microalbuminuric patients, 224 patients had mild albuminuria, 38 had moderate albuminuria, and 38 had severe albuminuria. Baseline clinical and laboratory characteristics of the patients are shown in table. Mean age of diabetic with microalbuminuria was 53.2 ± 11.9 years. Age had statistically significant as compared to no significant gender-wise association of microalbuminuria. Mean BMI of microalbuminuric patients was $27.48 \pm 5.01 \text{ kg/m}^2$.

Table No.1: Characteristic of association of Microalbuminuria with demography and anthropometry

Variable	Mean \pm SD	P-Value
N =300		
Age (mean \pm SD)	53.2 ± 11.19	.015
Female N (%)	199(66.3)	.357
Male N (%)	101(33.7)	
BMI(kg/m^2)mean \pm SD)	27.48 ± 5.01	$<0.001^*$
Weight(kg)		.808
Serum cholesterol(mmol/L)	5.88 ± 1.30	$<0.001^*$
Combination drugs	39(27.9)	.003
Old and new diabetic	1(.7)	.160
Numbers of years of T2DM	31.6 ± 12.7	.050
Blood sugar random	238.70 ± 108.3	$<0.001^*$

Chi-Square; *one sample t test

The association between the micro-albuminuria and BMI was statistically significant. Mean duration of diabetes in microalbuminuric patients was 31.6 ± 12.7 years, which was statistically significant when compared with degree of albuminuria. Among the 300 patients, 200 were only on oral hypoglycemic agents,

70 were on insulin, and 30 were on both insulin and oral hypoglycemic agents. Average random blood sugar was $238.70 \pm 108.3 \text{ mg/dl}$ in microalbuminuric. Association between blood sugars of diabetes and microalbuminuria was statistically significant.

DISCUSSION

This cross-sectional study in type-2 diabetes mellitus patients has shown higher prevalence of microalbuminuria at 30% when compared to 25% prevalence of previous studies. Higher prevalent microalbuminuria may be due to irregular medication with poor glycemic control, small sample size and difference in method of estimation of laboratory. The level of glycemic control is strongest predictors of progression of microalbuminuria. Ours research has shown comparable results with earlier study in regard of statistical significant association of microalbuminuria with age.¹³ Female preponderance of microalbuminuria in previous studies is similar to ours study. Association between BMI and microalbuminuria has been demonstrated by ours study as shown previously. Diabetic nephropathy can be initiated from renal hypertensive stage followed by clinical latency with raised glomerular filtration and absent albuminuria. Subsequently incipient nephropathy with normal glomerular filtration and microalbuminuria appears 5–15 years after the diagnosis of diabetes mellitus. Glomerular filtration rate (GFR) further decreases with appearance of macroproteinuria and clinical diabetic nephropathy which ends up in end stage renal disease (ESRD) with massive albuminuria. Microalbuminuria may not be associated with abnormal creatinine clearance but can be an important warning signal result in irreversible renal damage.

Our study was in accordance with many previous studies regarding association of microalbuminuria with duration of diabetes mellitus. Duration of diabetes is strong predictor for microalbuminuria by predisposition of hyperglycemia-induced advanced glycosylation end products. Hypercholesterolemia is associated with microalbuminuria in previous study as shown in ours study. Types of control of diabetes with therapeutic intervention is ultimate determinant of development of diabetic nephropathy.¹⁴ Limitations in ours study was hospital based base and small samples size that were not true representative of general population. Moreover hypertension had been not evaluated for its association with microalbuminuria¹⁵⁻¹⁶.

In conclusion we have found in T2DM age, BMI, hypercholesterolemia, hyperglycemia and duration of diabetes are the strong predictors of later development of microalbuminuria resulting in diabetic nephropathy. There is no association of sex and microalbuminuria in T2DM in ours study. Microalbuminuria should be prevented in order to avoid renal damage by timely administration of ACE inhibitors, good glycemic

control and correction of other risk factors. UEA should be monitored routinely in patients with diabetes mellitus.

CONCLUSION

In type 2 diabetic statistical significant associations has shown between degree of microalbuminuria, age, blood sugars, cholesterol, body mass index and duration of diabetes mellitus

REFERENCES

1. Yang X, Ma RC, Ko GT, Kong AP, Lam CW, Ho CS, et al. Impacts of chronic kidney disease and albuminuria on associations between coronary artery disease and its traditional risk factors in type 2 diabetic patients-the Hong Kong diabetes registry. *Cardiovascular Diabetol.* 2007;6:37.
2. Gatling W, Mullee MA, Hill RD. The prevalence of proteinuria detected by Albustix in a defined diabetic population. *Diabet Med* 1988;5:256–260.
3. Ruilope LM, Rodicio JL. Clinical relevance of proteinuria and microalbuminuria. *Curr Opin Nephrol Hypertens* 1993;2:962–7.
4. Marshall SM. Screening for microalbuminuria: Which measurement? *Diabet Med* 1991;8:706–11
5. Wanjohi FW, Otieno FCF, Ogola EN, and Amayo EO. Nephropathy in patients with recently diagnosed Type 2 diabetes mellitus in Black Africas. *East Afri Med J* 2002;79:399–404.
6. Cederholm J, Eliasson B, Nilsson PM, Weiss L, Gudbjornsdottir S. Microalbuminuria and risk factors in type 1 and type 2 diabetic patients. *Diabetes Res Clin Pract* 2005;67:258–266.
7. Stratton IM, Adler AI, Neil AW, Matthews DR, Manley SE, Cull CA, et al. On behalf of the UK Prospective Diabetes Study Group Association of glycaemia with macrovascular and microvascular complications of type 2 diabetes (UKPDS 35): prospective observational study. *BMJ* 2000; 321: 405–412.
8. American Diabetes Association Economic Costs of diabetes in the U.S. in 2007. *Diabetes Care* 2008; 31:596–615.
9. Gall MA, Rossing P, Skott P, Damsbo P, Vaag A, Bech K, et al. Prevalence of micro- and macroalbuminuria, arterial hypertension, retinopathy and large vessel disease in European type 2 (non-insulin-dependent) diabetic patients. *Diabetologia* 1991;34:655–661.
10. Phillips CA, Molitch ME. The relationship between glucose control and the development and progression of diabetic nephropathy. *Curr Diab Rep* 2002; 2:523–529.
11. Stettler C, Allemann S, Juni P, Cull CA, Holman RR, Egger M, et al. Glycemic control and macrovascular disease in types 1 and 2 diabetes mellitus: meta-analysis of randomized trials. *Am Heart J* 2006;152:27–38.
12. Rodicio JL, Campo C, Ruilope LM. Microalbuminuria in essential hypertension. *Kidney Int* 1998;54:1523–755.
13. Ruilope LM, Segura J. Predictors of the evolution of microalbuminuria. *Hypertension* 2006;48:832–3.
14. Gæde P, Lund-Andersen H, Parving HH, Pedersen O. Effect of a multifactorial intervention on mortality in type 2 diabetes. *N Engl J Med* 2008; 358:580–591.
15. Mogensen CE. Microalbuminuria and hypertension with focus on type 1 and type 2 diabetes. *J Intern Med* 2003; 254:45–66.
16. Levin SR, Coburn JW, Abairra C, Henderson WG, Colwell JA, Emanuele NV, et al. Effect of intensive glycemic control on microalbuminuria in type 2 diabetes: Veterans Affairs Cooperative Study on Glycemic Control and Complications in Type 2 Diabetes Feasibility Trial Investigators. *Diabetes Care* 2000; 23:1478–85.

Renal Profile in Cases Subjected to Blunt Trauma

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ABSTRACT

Objective: To study the occurrence of renal failure in cases subjected to blunt trauma.

Study design: Analytical study.

Place and Duration of Study: This study was carried out at the Medico-legal clinic, Services Hospital, Lahore from January to December, 2007.

Materials and Methods: The study was based upon 50 cases of blunt trauma reporting at Medico-legal clinic, Services Hospital, Lahore. Twenty normal healthy controls were taken for comparison purposes. The cases were clinically examined for presence of evidence of trauma. Urine and blood samples were taken for estimation of blood urea, creatinine, potassium & calcium.

Results: There were 47 males (94 %) and 3 females (6 %). The age of the subjects ranged between 18-70 years with mean of 30.9 ± 12.34 , maximum number (62 %) below the age of 30. The injuries found were abrasions / bruises in 45 cases (90 %), lacerated wounds in 5 cases (10 %). In most of the cases (40%) injuries were distributed in more than one body region. As single area involvement the head and face area was affected in one case (2 %), chest in 4 cases (8 %) and limbs in 25 cases (50 %). The most commonly involved areas were buttocks, thighs, back of chest. Twenty nine cases (58 %) reported for examination within 24 hours. Thirteen cases (26 %) reported between 24-48 hours and 8 cases (16 %) reported between 48-72 hours after being traumatized.

Urine Examination showed yellow colour in 44 cases (88%) and brownish red in 6 cases (12 %). Specific gravity ranged between 1010-1030 with mean of 1020.6 ± 6.59 . It was between 1010-1019 in 14 cases(28%), 1020-1029 in 27 cases (54%) and 1030-1039 in 9 cases(18%). pH ranged between 5 – 8 with mean of 5.8 ± 0.75 . It was between 5 – 5.9 in 7 cases(14%) , between 6.0 – 6.9 in 27 cases(54%) , between 7.0 – 7.9 in 14 cases(28%) and 8.0 & above in 2 case(4%). In control group it ranged between 6.0 – 7.0 with mean of 6.4 ± 0.50 . Blood was positive in 7 cases(14%), and negative in 43 cases(86%). Microscopic Examination of urinary sediment showed pus cells 0 – 5 /HPF in 35 cases (70%), and above 5/HPF in 15 cases (30%). The red blood cells were present in 15 cases (30%). Calcium oxalate crystals were found in 39 cases (78%), triple phosphate in 5 cases (10%). In 6 cases (12%) no crystals were found. The cellular casts were present in 6 cases (12%).

In blood examination blood urea ranged between 15.5 – 86.0 mg/dl with a mean of 43.54 ± 15.06 . The blood urea was above reference range in 7 cases (14 %). Blood Creatinine ranged between 0.5 – 2.6 mg/dl with mean of 0.97 ± 0.47 . The raised blood creatinine was found in 7 cases (14%) . These cases are the same cases which have raised blood urea. Serum Potassium ranged between 3.2 – 5.9 mmol/dl with mean of 4.45 and S.D. 0.78. It is above reference range in 9 cases (18%). In cases with raised blood urea and creatinine it was raised in all cases. Serum Calcium ranged between 5.6 – 10.74 with mean of 8.84 ± 1.01 . The hypocalcaemia was seen in 25 cases (50%). In the cases with raised blood urea and creatinine the calcium was low in all cases. In our study 14% cases have shown the evidence of renal function derangement.

Conclusion: The cases subjected to blunt trauma are at threat to develop renal failure particularly in cases with dehydration and acidosis.

Key Words: blunt trauma, renal failure, myoglobinuria, rhabdomyolysis

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INTRODUCTION

Human beings are exposed to trauma in various situations and by various means. Sometime they meet an accident but at other times they are subjected to

intentionally caused injuries. The injuries could be caused by variety of means like blunt, sharp & firearms. The injuries caused by blunt means like bruises and lacerations are also associated with damage to underlying muscles. The traumatized muscles undergo rhabdomyolysis. The extensive muscle injury releases large quantities of myoglobin into circulation. Since its capacity to bind with serum proteins especially haptoglobins is low, it is freely filtered and appears in

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large quantities in the glomerular filtrate. Subsequently it caused extensive obstruction and necrosis of tubules resulting in acute renal failure.¹

Myo refers to muscle, *rhabdo* means striated (as in striated or skeletal muscle), and *lysis* is breakdown. Therefore, *rhabdomyolysis* (pronounced rab'-do-mi-ol'-i-sis) is a dissolution of skeletal muscles that produces a nonspecific clinical syndrome that causes extravasation of toxic intracellular contents from the myocytes into the circulatory system.²

The rhabdomyolysis is common clinical and laboratory syndrome resulting from skeletal muscle injury and acute renal failure is the most common complication.³

The rhabdomyolysis, myoglobinuria and renal failure have been known to follow massive crush injury.⁴

Crush injuries resulting in traumatic rhabdomyolysis are an important cause of acute renal failure. Intravascular volume depletion and renal hypoperfusion, combined with myoglobinuria, result in renal dysfunction.⁵

Rhabdomyolysis is a common entity that often has a multifactorial etiology. It usually affects healthy individuals, following trauma, excessive physical activity, convulsive crisis, alcohol and other drugs consumption or infections. . Myoglobinuric acute renal failure (ARF) is only possible in the presence of myoglobin, liberated by the muscle cells, and of hypovolaemia / renal hypoperfusion.⁶

The serum levels of myoglobin, creatinine, urea, beta microglobulin were measured in prolonged crush syndrome patients injured during Yervan Earth quake. A drastic increase of myoglobin level in blood was observed in all the patients by the moment of hospitalization. The level being the higher, the more severe the injury.⁷

The myoglobin has been found in serum and urine of patients after various types of muscle injury. In man and experimental animal renal damage and death have at times been the sequel to myoglobinuric states.⁸

The evidence of rhabdomyolysis included markedly elevated creatin phosphokinase (CPK), myoglobinuria and aldolase in blood.⁹

The myoglobin being nephrotoxic leads to acute renal failure which is a life threatening situation. It is important to apprehend the risk of ARF in such cases and to take appropriate measures in the treatment.

MATERIALS AND METHODS

The study was based upon 50 cases of blunt trauma reporting at Medico-legal clinic, Services Hospital, Lahore during January-December, 2007. Twenty normal healthy controls were taken for comparison purposes. The cases were clinically examined for presence of evidence of trauma. Urine and blood samples were taken at the end of clinical examination. Urine sample was collected in dry, clean wide mouth glass bottles of 250 ml capacity. Five cc blood was

taken in the disposable syringe. It was taken for estimation of Blood urea, creatinine, Potassium & Calcium.

RESULTS

Age: Frequency distribution of 50 cases with reference to age ranged between 18-70 years with mean of 30.9 ± 12.34 . There were 31 cases (62 %) below the age of 30 while 9 cases (18 %) were between 30-39, 5 cases (10 %) between 40-49 and 5 cases (10 %) were in age group 50-70.

The control group of 20 ranged between 24-43 years with mean of 31.2 ± 5.81 . (Table No.1)

Sex: Frequency distribution of subjects with reference to sex is 47 males (94 %) and 3 females (6 %). The control group comprised 18 male (90 %) and 2 (10 %) females. (Table No.2)

Table No. 1: Frequency distribution of subjects and control with reference to their age

Age in years	Subjects(n=50)		Control(n=20)	
	No. of cases	Percentage	No. of cases	Percentage
18-29	31	62	10	50
30-39	9	18	7	35
40-49	5	10	3	15
50-70	5	10	0	0
Mean \pm SD	30.9 ± 12.3		31.2 ± 5.8	
Range	18-70		24-43	

Table No. 2: Frequency distribution of subjects and control with reference to their sex

Sex	Subjects(n=50)		Control(n=20)	
	No. of cases	Percentage	No. of cases	Percentage
Male	47	94	18	90
Female	3	6	2	10

Type of injuries: The abrasions / bruises were seen in 45 cases (90 %). Multiple injuries (abrasions, bruises, lacerations) were present in 5 cases (10 %). Fractures were not seen in any case.

Distribution of injuries on the body: The area subjected to trauma was categorized into 4 regions i.e. head and face, chest, abdomen and limbs. Some cases had injuries located in one area while others had involvement of multiple areas. As single area involvement the head and face area was affected in one case (2 %), chest in 4 cases (8 %) and limbs in 25 cases (50 %). The remaining 20 cases (40 %) had injuries located in multiple areas. (Table No.3)

The most commonly involved areas in these regions were buttocks, thighs, back of chest and soles. The site of injury was described according to its location in any one of four regions i.e. head and face, chest, abdomen and limbs. The regional distribution is in accordance with Qisas and Diyat Act.²²

Duration of injuries: Twenty nine cases (58 %) reported for examination within 24 hours. Thirteen cases (26 %) reported between 24 – 48 hours and 8 cases (16 %) reported between 48 – 72 hours after being traumatized.

Table No. 3: Frequency distribution of subjects with reference to body region subjected to trauma

Body region	Subjects(n=50)	Percentage
Head and face	1	2
Chest	4	8
Abdomen	0	0
Limbs	25	50
Multiple(more than one region)	20	40

Urine Examination:

Colour: The colour of urine was yellow in 44 cases (88%) and brownish red in 6 cases(12 %) and yellow in the control group.

Specific gravity: It ranged between 1010 – 1030 with mean of 1020.6 ± 6.59 . It was between 1010-1019 in 14 cases(28%), 1020-1029 in 27 cases (54%) and 1030-1039 in 9 cases(18%). In control group it ranged between 1020 – 1030 with a mean of 1022.79 ± 3.79 . (Table No. 4)

pH: It ranged between 5 – 8 with mean of 5.8 ± 0.75 . It was between 5 – 5.9 in 7 cases(14%) , between 6.0 – 6.9 in 27 cases(54%) , between 7.0 – 7.9 in 14 cases(28%) and 8.0 & above in 2 case(4%). (Table No. 8) In control group it ranged between 6.0 – 7.0 with mean of 6.4 ± 0.50 .

Blood: It was positive in 7 cases(14%), and negative in 43 cases(86%). It was negative in control group.

Microscopic Examination: After centrifugation of urine, the urinary sediment was examined for cells, crystals and casts. The pus cells were present 0 – 5 /HPF in 35 cases (70%), and above 5/PHF in 15 cases (30%). The red blood cells were present in 15 cases (30%). Calcium oxalate crystals were found in 39 cases (78%), triple phosphate in 5 cases (10%). In 6 cases (12%) no crystals were found. The cellular casts were present in 6 cases (12%). In control group 1 – 3 pus cells/PHF were present in 6 cases (30%). Calcium oxalate crystals were seen in 4 cases (20%). No cellular casts were seen.

Table No. 4: Frequency distribution of subjects with reference to Specific gravity in urine sample

Specific gravity	Subjects(n=50)		Control(n=20)	
	No. of cases	Percentage	No. of cases	Percentage
1010-1019	17	34	0	0
1020-1029	22	44	17	85
1030-1039	11	22	3	15
Mean \pm SD	1020.4 ± 7.13		1022.79 ± 3.79	
Range	1010-1030		1020-1030	

p value > 0.05 (not significant)

Blood Examination

Blood Urea: The blood urea ranged between 15.5 – 86.0 mg/dl with a mean of 43.54 ± 15.06 . The blood urea was above reference range in 7 cases (14 %).

In the control group the urea ranged between 23.3 – 47.2 with a mean of 35.13 ± 6.48 . (Table No. 5)

Blood Creatinine: It ranged between 0.5 – 2.6 mg/dl with mean of 0.97 ± 0.47 . The raised blood creatinine was found in 7 cases (14%) . These cases are the same cases which have raised blood urea (Table No.6).

Table No.5: Frequency distribution of subjects and controls with reference to serum urea level.

Serum urea mg/dl	Subjects(n=50)		Control(n=20)	
	No. of cases	Percentage	No. of cases	Percentage
15-30	8	16	6	30
31-45	36	72	14	70
46-60	0	0	0	0
61-75	2	4	0	0
76-90	4	8	0	0
Mean \pm SD	43.54 ± 15.06		34.88 ± 6.08	
Range	15.5-86		23.3-47.2	

p value < 0.02 (significant)

Table No.6: Frequency distribution of subjects and controls with reference to serum creatinine level.

Serum Creatinine mg/dl	Subjects(n=50)		Control(n=20)	
	No. of cases	Percentage	No. of cases	Percentage
0.0-0.5	2	4	0	0
0.6-1.1	41	82	20	100
1.2-1.7	1	2	0	0
1.8-2.3	3	6	0	0
2.4-2.9	3	6	0	0
Mean \pm SD	0.97 ± 0.47		0.69 ± 0.10	
Range	0.5-2.60		0.5-0.9	

p value < 0.02 (significant)

Table No. 7: Frequency distribution of subjects and controls showing evidence of renal function derangement.

Renal status of cases		Subjects(n=50)		Control(n=20)	
		No. of cases	Percentage	No. of cases	Percentage
1	Normal renal profile	43	86	20	100
2	Deranged renal Profile	7	14	0	0

p value > 0.05 (not significant)

In control group blood urea ranged between 0.5 – 0.9 mg/dl with a mean of 0.69 ± 0.10 . (Table No. 6)

Serum Potassium: It ranged between 3.2 – 5.9 mmol/dl with mean of 4.45 and S.D. 0.78. It is above reference range in 9 cases (18%). In cases with raised blood urea and creatinine it was raised in all cases.

In control group it ranged between 3.7 – 5.0 m mol/dl and with a mean of 4.41 and S.D. 0.36.(Table No. 12)

Serum Calcium: It ranged between 5.6 – 10.74 with mean of 8.84 ± 1.01 . The hypocalcaemia was seen in 25 cases (50%). In the cases with raised blood urea and creatinine the calcium was low in all cases.

In the control group it ranged between 9.2 – 10.7 with a mean of 9.64 ± 0.39 .

DISCUSSION

The study was aimed to assess the extent and distribution of injuries in cases subjected to blunt trauma. This study revealed that persons at all ages were involved. However individuals in the 3rd decade were more prone (58% cases). This might be due to more active social involvement of the individuals in this age group. Both sexes were exposed to the situation but males were in quite higher number (94%).

When considering type of injury the majority (90%) suffered abrasions / bruises alone but some (10%) also had lacerated wounds in addition to abrasions and bruises.

Regarding the distribution of the injuries on the body, it was divided in 4 regions keeping in view the categorization of injuries under Qisas and Diyat Act 1997.¹⁰

In our study, injuries distribution on the limbs 50%, head and face 2%, chest 8% while in other cases (40%) it involved multiple regions. The most commonly involved areas were back of chest, buttocks & thighs.

The raised myoglobin in the blood is a threat to kidney. Therefore the evaluation of kidney function was made from urine examination and measurement of blood urea, creatinine, potassium and calcium.

In the urine examination the colour of urine was yellow in 44 cases, and brownish red in 6 cases. While in the cases of acute myoglobinuric renal failure reported by Naqvi it was yellow in 6, brownish red in 4 & reddish in 2 cases.¹

There was no significant change in specific gravity. It ranged between 1010 - 1030 in all subjects.

There was significant change in pH. The pH in subjects ranged between 5-8 with mean 5.67 ± 0.86 . In control group it was 5.9-7.5 with mean 6.73 ± 0.49 . This finding was comparable with finding of Ray. According to him the nephro-toxicity was unlikely to occur in absence of hypovolaemia or when the urine pH was more than 5.6 (Ray 1999).¹¹ In study of Naqvi the pH ranged between 5.0 – 6.0 in all the cases of myoglobinuric renal failure.³ Dehydration and acidosis predispose the development of ATN.¹²

Acidosis had been suggested as an important factor in myoglobinuric renal failure, and urine alkalization was routinely recommended for its prevention. Early and adequate water supply and alkalization played an essential role in prevention of impairment in renal function.⁹

Presence of acidosis and venous serum bicarbonate level below 17 mEq/L was found to be predictor of development of ATN in patients with soft tissue injury that were hospitalized for trauma (Muckhart 1992). According to Braun, at or below urine pH of 5.6 or below both myoglobin and haemoglobin dissociate into ferrihemate and globin moieties. Ferrihemate appeared to have toxic effects on renal tubules.¹³

The blood was positive in 7 cases (14%). This finding was in consensus with observations of Naqvi et al, where all the 12 cases of myoglobinuric renal failure were positive for blood. (Naqvi et al 1995).¹

The microscopic examination of urinary sediment showed numerous RBC in all the cases which were positive for blood (14%). This is comparable with Naqvi et al where 100% cases of renal failure were positive for microscopic haematuria (Naqvi et al 1995).¹ Pus cells, more than 5/PHF, were seen in 30% cases. Calcium oxalate crystals were found in 78% cases and Triple phosphate in 10% cases. Epithelial casts were present in 12% cases.

The blood urea was raised significantly as compared with control group. It ranged between 15.5 – 86.0 mg/dl with a mean of 43.54 ± 15.06 . In a study of Ali the 5 cases of traumatic rhabdomyolysis presenting with renal failure had blood urea between 50 – 105 with a mean value 73.4.¹²

There was significant rise in serum creatinine. It ranged between 0.5 to 2.6 mg/dl with mean of 0.97 ± 0.47 . In 12 cases of Naqvi the serum creatinine ranged between 6.1 to 28.7 mg % with mean of 16.5.¹

It ranged between 3.2 - 5.9 m mol/l with mean of 4.45 ± 0.78 . Although statistically the change in the serum potassium was non significant but 9 cases (18%) potassium level was above reference range. In Naqvi's study 42% of renal failure cases had blood potassium within reference range while the rest had raised potassium with mean of 6.07.¹

According to Durbow and Flamenbaum, Hyperkalemia might be severe in myoglobinuric ARF. Intracellular potassium concentration might be as high as 140 mEq/l and this potassium was released into the extracellular fluid after muscle necrosis.¹⁴

Statistically there was significant change in serum calcium. It was low in 50 % of subjects. This finding was consistent with that of Naqvi where 58.3 % cases of renal failure showed hypocalcaemia.¹

Hypocalcaemia is often seen in myoglobinuric ARF. It is partly due to deposit of calcium in damaged muscles and partly other factors like due to hyperphosphatemia following muscle damage.¹⁴

Abnormal calcium metabolism was a common complication of rhabdomyolysis-induced acute renal failure. During oliguric phase patients were frequently hypocalcaemic. Hyperphosphatemia and skeletal resistance to parathyroid hormone were believed to be possible underlying mechanisms. There was

hypercalcaemia during diuretic phase after rhabdomyolysis. It was due to mobilization of calcium deposits from soft tissues including muscles.¹⁵

In our study 14% cases have shown the evidence of renal function derangement. (Table 7). These cases had urine colour brownish red in 6 cases and yellow in one case, haematuria in all cases, specific gravity 1010, pH 5, serum myoglobin 760-1176 ng/dl, serum urea 64-86mg/dl, serum creatinine 1.8-2.6 mg/dl, serum potassium 5.6-5.9 mmol/dl, serum calcium 7.0-8.5 mg/dl. These finding were comparable with of studies at other centres. In confirmed cases of Myoglobinuria about one third of patients developed ATN. Dehydration and acidosis predispose to development of ATN.^{4,16}

CONCLUSION

The cases subjected to blunt trauma are at threat to develop renal failure particularly in cases with dehydration and acidosis.

Recommendations: In order to minimize the risk of renal failure it is recommended to institute a timely management.

REFERENCES

1. Naqvi R, Akhtar F, Yazdani J, Hafiz S, Zafar N, Naqvi A, et al. Acute Renal Failure due to Traumatic Rhabdomyolysis. *JPM* 1995;45(3): 59-61.
2. Criddle LM. Rhabdomyolysis Pathophysiology, Recognition, and Management, *Critical Care Nurse* 2003;23:14-30.
3. Hojs R, Ekart R, Sinkovic A, Hojs-fabjan T. Rhabdomyolysis and acute renal failure in intensive care unit. *Renal failure* 1999;21(6): 675-84.
4. Bywaters EGL, Beal D. Crush injuries with impairment of renal Function. *J Am Society of Nephrol* 1998;9(2):322-32.
5. Malinoski DJ, Slater MS, Mullins RJ. Crush injury and rhabdomyolysis, *Crit Care Clin* 2004;20(1): 171-92.
6. Rosa NG, Silva G, Teixeira A, Rodrigues F, Araujo JA. Rhabdomyolysis, *Acta Med Port* 2005; 18(4):271-81.
7. Binnitskii LI, Egorov IA, Bronskaia LK. Myoglobin concentration in blood: a criterion in the evaluation of muscular tissue injury in patients with prolonged crush syndrome. *Anesteziol Reanimatol* 1995;4:47-9.
8. Kagen LJ. Immunofluorescent Demonstration of Myoglobin in the kidney. *The Am J Med* 1970;48(5):649-53.
9. Koffler A, Friedler RM, Massry SG. Acute renal failure due to nontraumatic Rhabdomyolysis. *Annals of Intl Med* 1976;85(1):23-28.
10. Qisas and Diyat Act. Government of Punjab. 1997.
11. Ray M. Crush injury and its complications. *Med Herald Lahore* 1999;3:16.
12. Ali SA, Ahmed M. Myoglobin induced renal failure, not uncommon but often unrecognized cause of acute renal failure in Pakistan. *J Pak Orth Assoc Lahore* 1997; 9:39-50.
13. Braun SR, Weiss SR, Keller AL, et al. Evaluation of renal toxicity of heme proteins and their derivatives: a role in genesis of acute tubular necrosis. *J Exp Med* 1970; 131(3):443-460.
14. Durbow A, Flamenbaum W. Acute renal failure Associated with Myoglobinuria and Haemoglobinuria. In: *Acute Renal Failure*, Churchill Livingstone 1988:79-93.
15. Sperling LS, Tumli JA. Delayed hypercalcaemia after rhabdomyolysis-induced acute renal failure, *Am J Med Sci* 1996; 311(4):186-8.
16. Muckart DJ, Moodley M, Naidu AG, et al. Prediction of acute renal failure following soft tissue injury using the venous bicarbonate concentration. *J Trauma* 1992;33(6):813-7.

Frequency of Three Complications (Bleeding, Laceration of External Auditory Canal and Perforation of Tympanic Membrane) in Patients with Aural Foreign Bodies

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ABSTRACT

Objectives: To determine the frequency of three major complications of the foreign body in the external auditory canal i.e. the haemorrhage, the laceration and the perforation of the tympanic membrane.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted in the Department of ENT, Bahawal Victoria Hospital, Bahawalpur from 25-12-2012 to 24-09-2013.

Materials and Methods: Total 284 cases that presented during nine months of duration were included in our study. General anaesthesia was used not only when initial attempt under direct visualization was unsuccessful, but also for those having history of previous attempts, and uncooperative patients.

Results: 25% of patients developed haemorrhage, 13.8% were having laceration while none of the patient presented with tympanic membrane perforation. Cotton bud was found to be the commonest foreign body (33.7%) and bleeding was associated with it.

Conclusion: In this study, the cotton bud was found to be the commonest foreign body in external auditory canal. Use of cotton bud although is easy for cleaning of ears but if it is broken inside the external auditory canal, can cause serious complications like bleeding and laceration as found in this study. Public should be educated about this preventable medical emergency.

Key Words: Foreign Body, External Auditory Canal, General Anaesthesia

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INTRODUCTION

Common otorhinolaryngological emergencies are foreign bodies. Eleven percent of the visits to otorhinolaryngologists are due to foreign bodies. Complication rates have been seen to be high as twenty two percent. The majority of the patients have foreign bodies in the ear.¹⁻²

Foreign bodies within external ear present both in children and adults.³ The problem is very common among children, more so in school going children than the toddlers.⁴⁻⁵ These objects can be inorganic including beads, buttons, stones and disc batteries or organic such as cotton buds, broken match sticks, eraser tips, pieces of paper, seeds, other food particles and live insects. Insects are found to be more common in patients older than 10 years of age.⁶ The most common foreign body types were plastic beads and pearls that

were seen in 29.2% cases⁷. Complications of foreign body ear include bleeding (51.83%)², laceration and

rupture of the tympanic membrane (0.99%)². Studies have shown that the complication rate increases with the increase in the number of failed attempts to remove the foreign body. The first attempt is, therefore, critical.⁶

Removal of these foreign bodies from ear is a very commonly performed procedure. This may be a simple outpatient procedure or occasionally this requires sedation or even general anesthesia⁷ and removal under operating microscope, especially when the foreign body is deeply impacted, or the patient is a struggling child not allowing proper positioning and uncomplicated removal.

The aim of the study was to identify the different types of foreign bodies in external auditory canal and the risk of three major complications associated with each of them in our setup. Data collected of duration of impaction of foreign body also helps us in identifying the foreign bodies more dangerous than the others

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requiring prompt treatment and to educate people of risks associated with them.

The rationale of this study is based upon recommendations of different previous studies⁸⁻¹⁰ that were conducted to evaluate the frequencies of different complications in aural foreign bodies.

MATERIALS AND METHODS

This cross sectional study was conducted in Department of ENT, Bahawal Victoria Hospital, Bahawalpur from 25-12-2012 to 24-09-2013. Total 284 patients of all ages and both genders found to have foreign bodies in their external ears were included in this study. Patients having (a) wax in ear (b) Otitomycosis/otitis externa (c) with past history of attempts of removal of foreign body (d) not consenting for otoscopy were excluded from the study. An approval was taken from institutional review committee. Informed consent was taken from the patient or the patient's guardian if the child was less than 18 years of age.

A detailed history focusing on the age, sex, presenting complaint (patient's own complaint or attendant's statement in case of a child), and approximate duration in hours for which the foreign body has been in the ear was documented. Afterwards, otoscopic examination of both ears was carried out and patients with foreign bodies in their ear took part in the study. Patients with incidental findings were also included.

An initial attempt of extraction was tried by post graduate trainee with head mirror and reflected light or under aural microscope in case of an adult or child with a deep seated foreign body. When initial attempt failed then sedation or general anaesthesia was given to the patient and extraction was attempted. After removing the foreign body, its type, laceration, ear bleed and perforation of tympanic membrane was noted in the performa.

All the data was analyzed using the Statistical Package for Social Sciences version 13. Descriptive statistics (frequencies, percentages, tables and charts) was used to describe categorical variables (gender, nature of foreign body and complications). Numerical data (age and duration of impaction in the ear) was described using mean and standard deviation. Stratification was done for effect modifiers like age, gender and duration of disease and post-stratification chi square was applied to see their effect on outcome. P-value ≤ 0.05 was considered as significant.

RESULTS

Total duration of this study was nine months and during that time, 284 patients were included in the study that fulfilled the above mentioned criteria. Out of 284 patients, 200 patients were below ten years of age that is 70.3 % (Table 1). Mean age of presentation was 10.5 years ± 9.1 (Mean \pm S.D), table-1. 180 patients were male(63.3%) and 104 (36.7%) were female.(Fig. 1)

The most common presented foreign body in ear was cotton bud, out of 284 patients, 96 were having this i.e 33.7%. The second commonest foreign body was metallic bead presented in 58 patients (20.4%), while 52 patients presented with plastic bead (18.4%). 25 presented with seed i.e. 8.7%. Wooden stick was found in 23 patients i.e. 8.2% while stone was found in 12 patients 4.1%. 70 patients were having insects i.e. 2.6%. Eraser tips were found in 04 patients i.e. 1.5%. Disc battery and any other (piece of tissue paper) found in 03 patients each i.e. 1% each. While button was found in 01 patients i.e. 0.5 %.(table 2)

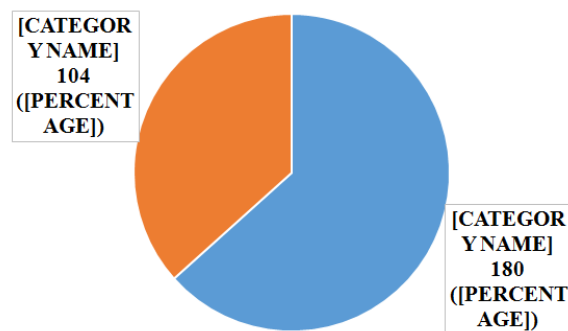


Figure No.1: Gender distribution of patients

Table No.1: %age of patients according to Age distribution (n=284).

Age (in years)	No. of Patients	%age
2-10	200	70.3
11-30	62	22.06
31-45	22	7.68
Total	284	100.0

Table No.2: Type of foreign body

Foreign body	Frequency	Percentage
Cotton Bud	96	33.7
Metallic Beed	58	20.4
Plastic Beed	52	18.4
Seed	25	8.7
Wooden Stick	23	8.2
Stone	12	4.1
Insect	07	2.6
Eraser Tips	04	1.5
Disc Battery	03	1.0
Button	01	.5
Anyother	3	1.0
Total	284	100.0

Table No.3: Complications

Complication	Frequency	Percentage
Bleeding	71	25.0
Laceration	39	13.8
Perforation	Nil	0
Nil	174	61.2
Total	284	100.0

Complications i.e. bleeding through canal was found in 71 patients i.e. 25% and laceration of external auditory

canal was found in 39 patients i.e. 13.8% while we did not come across any patient with perforation of tympanic membrane. No complication was found in 174 patients i.e. 61.2% (table 3).

DISCUSSION

Removing foreign bodies, especially from children's ears can be sometimes very difficult and challenging due to several factors including the cooperation level of the patient, type of foreign body, available facilities for removal of foreign body and expertise of the treating doctor.^{11,12} Multiple failed attempts on a same ear usually result in trauma to external canal or can even lead to tympanic membrane perforation and lodgement of foreign body further deep into middle ear.³

The insertion of foreign body is more common among children.

In our study one hundred and thirty patients were below the age of ten, which is 70.3 % of the total cases. The mean age is 10.03 years. This age is less as compared to the study conducted by Thompson et al.¹⁰, in which the mean age was 16.8 years. But the range differed in our study (Standard deviation for age is ± 7.99 years, while the range in study by Thompson et al.¹⁰ was from 1 to 90 years). In another study by Fasunla et al.¹², the mean age was calculated as 10.9 years while the range was from 2 to 59 years.

It is important to mention here that, in our study the age of ten has been made as the demarcation between children and adults. This can differ in other studies, for example in a study by Ryan et al.¹³, the age of 18 was used as division between adults and children. Age of 15 was determined to be the demarcation between adults and children in the study by Fasunlaet al.¹² In a study by Amjad and Abbas¹⁴, the most common age group of children with foreign bodies in their ears was also 4-8 years of age.

Ahmed et al.⁷, in their study on paediatric ear foreign bodies also found 4-8 years of age group to be the most common age group having foreign bodies in their ears. They used age of 12 as an upper limit to paediatric age group.

In different studies on different otorhinolaryngology foreign bodies and not just ear foreign bodies, the most common age group was also 4-8 years of age.¹⁵⁻¹⁷

In a ten years retrospective study by Fasunlaet al.¹², total number of patients included in the study was 419. It is to be noted that if we compare duration of our study with these studies, then our study duration is less, just six months.

As observed in other studies, males were relatively more common in our study (63.3 %). Amjad and Abbas¹⁴ in their study also found males to be more common as having foreign bodies in their ears (81%). The study by Ahmed et al.⁷ also revealed male preponderance (62.69%).

In the study by Thompson et al.¹⁰, the most common presenting symptom was also history of foreign body and out of 162 patients, 126 (78 %) had only a history of a foreign body without any other symptom. This percentage differs with our study. While in our study the most common complaint was otalgia 66.3% and the second most common was complaining themselves of foreign body in the ear 20.9%. The second most common symptom in the study by Thompson et al.¹⁰ was incidental finding (10%) and the next was otalgia (9%). This differs from our study as only nine out of one hundred and ninety six patients (4.6%) in our study had incidentally removed foreign bodies from their ears. In addition, Thompson et al.¹⁰ have not documented that how many of their patients had combination of symptoms as nine of our patients had two or more symptoms at the time of presentation. Fasunlaet al.¹², in their study also noted symptoms similar to our study but their results differ from our study. History of a foreign body was present in 90.9 % of their patients, while otalgia was the next most common symptom (71.1 %). Ansley JF¹⁷ and Ngo A¹⁸ also observed that the most common presenting symptom of patients with ear foreign bodies was positive history as patients own statement or an eye witness.

In a case report by Nasim Shahid¹⁹ on a 'growing seed' removed from ear of a mentally sound twenty years old patient; the symptoms were intense itching, occasional pain and heaviness in the ear for the last 45 days before the patient presented to hospital.

None of our patients had unusual symptoms like cough or hiccups as a primary complaint.

Schulze et al.⁹, in their study have not mentioned about the symptoms, but they looked for concomitant pathologies, most common being otitis media. Canal abrasions or bleeding was found 5.3% of their patients. Seventy six out of one hundred and ninety six (38.8%) in our study had their ears already traumatized. Bleeding was present in 49 (25%) and laceration was present in 27 patients (13.8%) and we could not find any patient with tympanic membrane perforation. Figueiredo R et al.² found approximately similar results in their study i.e. bleeding (51.83%)², laceration and rupture of the tympanic membrane (0.99%)².

CONCLUSION

In this study, the broken piece of cotton bud was found to be the commonest foreign body in ear, as it is commonly used for cleaning of ears. But it has caused serious complications like bleeding and laceration of external auditory canal. I suggest that community should be educated through media and literature about the complications to discourage self-instrumentation among the children and adults. It is common saying that if you want to put something into your ear, put your elbows.

REFERENCES

1. Iseh KR, Yahaya M. Ear foreign bodies: observations on the clinical profile in Sokoto, Nigeria. *Ann Afr Med* 2008;7:18-23.
2. Figueiredo RR, Azevedo AA, ÁvilaKós AO, Tomita S. Complications of foreign bodies in otorhinolaryngology: a retrospective Study. *Rev Bras Otorrinolaringol* 2008;74:7-15.
3. Peridis S, Athanasopoulos I, Salamoura M, Parpounas K, Koudoumnakis E, Economides J. Foreign bodies of the ear and nose in children and its correlation with right or left handed children. *Int J Pediatr Otorhinolaryngol* 2009;73:205-8.
4. Santos F, Selensick SH, Grunstein E. Diseases of external ear. In; Lalwani AK, editor. *Current diagnosis & treatment in otolaryngology-head & neck surgery*. Singapore; McGraw-Hill companies; 2004.p.659- 77.
5. Endican S, Garap JP, Dubey SP. Ear, nose and throat foreign bodies in Melanesian children: an analysis of 1037 cases. *Int J Pediatr Otorhinolaryngol* 2006;70:1539-45.
6. Ologe FE, Dunmade AD, Afolabi OA. Aural foreign bodies in children. *Ind J Pediatr* 2007;74: 755-8.
7. Ahmed Z, Matiullah S, Rahim D, Marfani MS. Foreign bodies of ear in children presenting at Civil Hospital Karachi. *Pak J Otolaryngol* 2008; 24:12-4.
8. Weiser M, Levy A, Neuman M. Ear stuffing: an unusual form of self mutilation. *J NervMent Dis* 1993;181:587-8.
9. Schulze SL, Kerschner J, Beste D. Pediatric external auditory canal foreign bodies: a review of 698 cases. *Otolaryngol Head Neck Surg*. 2002; 127:73.
10. Thompson SK, Wein RO, Dutcher PO. External auditory canal foreign body removal: management practices and outcomes. *Laryngoscope*. 2003;113: 1912-5.
11. Tsunoda K, Baer T. An uninvited guest in the ear. *Am Fam Physician* 2000;61:2606-2611.
12. Fasunla J, Ibekwe T, Adeosun A. Preventable risks in the management of aural foreign bodies in western Nigeria. *The Internet J Otolaryngology*. [Serial online].2007 [cited 2008 March 7]; 7(1). Available from URL; <http://www.ispub.com/ostia/index.php?xmlFilePath=journals/ijorl/vol7n1/risks.xml>.
13. Ryan C, Ghosh A, Wilson-Boyd B, Smith D, O'Leary S. Presentation and management of aural foreign bodies in two Australian emergency departments. *Emerg Med Austr* 2006;18(4):372-8.
14. Amjad M, Abbas N. Foreign bodies in ear in children. *Pak Paed J* 1999;23:61-2.
15. Ibekwe TS, Nwaorgu OGB, Onakoya PA, Ibekwe PU. Paediatric otorhinolaryngology (ORL) emergencies: A tropical country's experience. *Emerg Med Australasia* 2007;19(1):76-77.
16. Kumar S. Management of foreign bodies in the ear, nose and throat. *Emerg Med Australas*. 2004; 16(1):17-20.
17. Ansley JF, Cunningham MJ. Treatment of aural foreign bodies in children. *Pediatrics*. 1998;101: 638-41.
18. Ngo A, Ng KC, Sim TP. Otorhinolaryngeal foreign bodies in children presenting to emergency department. *Singapore Med J* 2005;46:172-8.
19. Shahid N. Growing seed as a foreign body ear. *Pak J Otolaryngol* 2003;19:48-9.

Salivary Gland Tumours: A Tertiary Care Hospital Experience

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ABSTRACT

Objective: To study demographic, clinical and histopathological features of salivary gland tumours in a tertiary care hospital.

Study Design: Prospective cross sectional study.

Place and Duration of Study: This study was carried out in the Department of ENT, Head & Neck surgery, Postgraduate Medical Institute, Lady Reading Hospital Peshawar from June 2010 to May 2014.

Materials and Methods: This prospective cross sectional study of 4 years was carried out in the Department of ENT, Head & Neck surgery, Postgraduate Medical Institute, Lady Reading Hospital Peshawar. All the patients qualifying inclusion criteria were evaluated in terms of detailed history, thorough examination and relevant investigation. After performing required surgery specimen was examined for histopathology.

Results: In this study 123 patients were included with mean \pm SD age of 40 \pm 5.1 years (age range 7–76 years). Males were 81 and females were 42 with male: female ratio of 1.9:1. Most of the patients presented in 4th decade (28.45%, 35). Lump was the commonest clinical feature lasting for 1-5 years (66.66%, 82). Among the tumours 77.23% were benign while 22.76% were malignant. Benign tumours were commonly noticed in parotid gland (53.65%). Pleomorphic adenoma was the commonest benign tumour (65.04%, n=80), affecting parotid gland in 52.03%. Mucoepidermoid carcinoma is the commonest malignant tumour (12.19%) predominantly found in minor salivary gland of palate (6.50%).

Conclusion: Salivary gland tumours predominantly affecting middle aged male population. Benign tumours are the commonly occurring salivary gland tumours. Pleomorphic adenoma is commonly occurring benign tumour affecting predominantly parotid gland while mucoepidermoid carcinoma is the commonest malignant tumour of salivary glands.

Key Words: Benign, Malignant, Tumours, Major and minor salivary gland, Histopathology

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INTRODUCTION

The major salivary glands are parotid, submandibular and sublingual while minor salivary glands are located throughout submucosa of upper aero-digestive tract with maximum amount on the palate. Both benign and malignant tumours may develop in salivary glands. Although tumours of salivary gland are less than 1% of the all tumours, however prevalence of these tumours reported in the literature differs.¹ It constitutes 2% to 4% of all the head and neck tumours. The annual prevalence of salivary gland tumours across the globe is reported from 0.4 to 14 cases per 100,000 populations. The annual prevalence of malignant tumours of salivary

gland ranges from 0.4 to 2.6 per 100,000 populations. The commonest benign and malignant tumours of salivary gland are pleomorphic adenoma and mucoepidermoid carcinoma, respectively.² The incidence of tumours is that about 80% involves parotid gland, while 10% to 20% occurs in submandibular and sublingual glands. Approximately 80% of benign tumour of parotid gland is pleomorphic adenoma.¹ The exact cause for these tumours is still unknown; probably tobacco, vitamin A deficiency, Ionizing radiation, chemotherapy and prolonged exposure to sunlight may contribute in their development. The presenting feature of benign salivary gland is a long standing lump, while malignant counterpart can present with rapid growth in lump, pain, nerve paralysis, skin involvement, trismus, fistula formation, weight loss and cervical lymphadenopathy.^{2,3} About one third of malignant parotid tumours involve facial nerve, where as malignant tumours of submandibular gland may invade hypoglossal nerve followed by trigeminal and facial

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nerves. Regarding embryological development of salivary gland it is assumed that these glands develop as result of initial thickening of the epithelium of the stomodeum, where as parotid gland develops from oral ectoderm while submandibular and sublingual glands develop from endodermal germ layers.³ As due to complexity of salivary gland structures and rarity of occurrence of tumors, it is a diagnostic dilemma for histopathologist on one hand and a challenge for its classification on the other hand. World Health Organization (WHO) established first classification of salivary gland tumours in 1972, which has been amended so many times in last 4 decades.⁴ The diagnosis of salivary gland tumours can be achieved with clinical features complemented with ultrasonography, sialography, computed tomography, magnetic resonance imaging, fine needle aspiration cytology; confirmed by histopathological study of the specimen. However it is difficult to distinguish between benign and malignant salivary gland tumours on basis of fine needle aspiration cytology.^{2,4} In case of benign salivary gland tumours total excision of the tumour is treatment of choice followed by observation for any recurrence, while in case of malignant tumours treatment option is; total excision of primary tumours along with removal of the surrounding involved tissues, as well as neck dissection, followed by chemo-radiotherapy. The incidence of complications especially damage to nerve is common in malignant tumours due to close relationship of nerve with gland.⁵ As salivary gland tumours are common in our society and sizeable cases are frequently presenting to our unit, which are managed properly. So this study was aimed to look into demographic, clinical and histopathological features of salivary gland tumours.

MATERIALS AND METHODS

This prospective cross sectional study of 4 years duration (June 2010 to May 2014) carried out in the Department of ENT, Head & Neck surgery, Postgraduate Medical Institute, Lady Reading Hospital Peshawar. After getting approval from hospital ethical board patients were enrolled in study qualifying inclusion criteria. All patients of either gender in the age range of 7 to 75 years were included in study, while patients not willing for registering in study, operated in

other health care facility and with non-tumour salivary gland diseases were excluded. Well informed written consent was taken from each patient explaining risks, benefits, associated complication of the procedure, prognosis of the disease and if needed publication of photograph. Every patient was evaluated in terms of detailed history, thorough meticulous local, ENT and upper aero-digestive mucosal lining and systemic examination complemented by relevant investigations especially ultrasonography, sialography and fine needle aspiration cytology (FNAC) of the mass. Every mass was assessed for its site, size, consistency, duration, fluctuation, transillumination, surrounding structure status, bimanual palpation, lymphadenopathy, skin and neurological involvement. After getting diagnosis of the lesion based on clinical assessment, radiological investigation and FNAC, surgery was performed accordingly depending upon the nature, extent and prognosis of the disease. Each patient was put on postoperative injectable empirical antibiotics, analgesics for 3-7 days depending upon the severity of the condition. Drain from wound site was removed after 24 hour if there was less than 25 ml collection in drain. The specimen was examined by same histopathologist to confirm the diagnosis and if needed patients was subjected to chemo-radiotherapy. The data were administered into a predesigned proforma and analyzed using SPSS version 17.

RESULTS

In this study 123 patients were included with mean±SD age of 40±5.1 years (age range 7–76 years). Males were 81 and females were 42 with male: female ratio of 1.9:1. Most of the patients presented in 4th decade (28.45%, 35), followed by 2nd and 3rd decades (17.88%, 22 and 15.45%, 19). Right side salivary glands were commonly involved (75.61%, 93) and among these glands parotid gland was commonly affected (68.29%, 84) while glands in cheek were least involved (4.1%, 5) (Table 1). Regarding clinical features of salivary gland tumours; in majority of patients lump was lasting for 1-5 years (66.66%, 82). The commonest size of the swelling measured was 6-10cm² (69.91%, n-86), with mean size 7.3±3.6 cm. Most of the swelling (72.35%) were firm on palpation and slow growth of the lump was noticed in most of the patients (61.78%).

Table 1: Age, gender, side and site-wise distribution of salivary gland tumours (n=123)

Age (yrs)	Mean±SD	Male (%)	Female (%)	Right (%)	Left (%)	Parotid (%)	Submand (%)	Palate (%)	Cheek (%)
≤10		2 (1.62)	-	1(0.81)	1(0.81)	2(1.62)	-	-	-
11-20	14±3.2	9 (7.31)	2(1.62)	9(7.31)	2(1.62)	6(4.87)	1(0.81)	4(3.25)	-
21-30	25±5.2	13(10.56)	9(7.31)	18(14.63)	4(3.25)	10(8.13)	7(5.69)	3(2.43)	2(1.62)
31-40	36±8.1	12(9.75)	7(5.69)	13(10.56)	6(4.87)	15(12.19)	2(1.62)	-	2(1.62)
41-50	44±2.5	23(18.69)	12(9.75)	27(21.95)	8(6.50)	29(23.57)	3(2.43)	2(1.62)	1(0.81)
51-60	56±7.8	10(8.13)	8(6.50)	15(12.19)	3(2.43)	11(8.94)	3(2.43)	4(3.25)	-
61-70	65±4.2	9(7.31)	3(2.43)	8(6.50)	4(3.25)	9(7.31)	2(1.62)	1(0.81)	-
≥71		3(2.43)	1(0.81)	2(1.62)	2(1.62)	2(1.62)	1(0.81)	1(0.81)	-
Total		81	42	93	30	84	19	15	5

Table No.2: Clinical features of patients with salivary gland tumours (n-123)

Status of Lump	Frequency (%)
Duration	≤ 12 months
	29 (23.58)
	1-5 years
Size	82 (66.66)
	≥ 6 years
	12 (9.75)
Consistency	< 5cm ²
	22 (17.88)
	6-10cm ²
Growth Pattern	86 (69.91)
	>11cm ²
	15 (12.19)
Cervical Lymphadenopathy	Soft
	9 (7.31)
	Firm
Pain	89 (72.35)
	Hard
	25 (20.32)
Fixity	Rapid
	16 (13.01)
	Slow
Facial palsy	76 (61.78)
	No growth
	31 (25.20)
Tenderness	Present
	15 (12.19)
	Absent
Transillumination	108 (87.80)
	Present
	14 (11.38)
Trismus	Absent
	109 (88.61)
	Present
Skin Involvement	13 (10.56)
	Absent
	110 (89.43)
Hypoglossal palsy	Present
	9 (7.31)
	Absent
	114 (92.68)
	Present
	8 (6.50)
	Absent
	115 (93.49)
	Present
	7 (5.69)
	Absent
	116 (94.30)
	Present
	5 (4.06)
	Absent
	118 (95.93)
	Present
	3 (2.43)
	Absent
	120 (97.56)
	Present
	1 (0.81)
	Absent
	122 (99.18)

Other features found were cervical lymphadenopathy, pain, fixity, tenderness and facial nerve palsy in 12.19%, 11.38%, 10.56%, 7.31% and 6.50% respectively (Table 2). Among these tumours 95 cases (77.23%) were benign while 28 cases (22.76%) were malignant. Overall benign tumours were commonly noticed in parotid gland (53.65%), followed by submandibular gland and palate i.e. 11.38% and 3.25% respectively. Among the benign tumours pleomorphic adenoma was the commonest histopathological finding (65.04%, n-80), followed by myoepithelioma (6.50%, 8). Pleomorphic adenoma was found in parotid gland 52.03%, submandibular gland 8.13% and only 1.62% in cheek. The overall incidence of malignancy was common in minor salivary glands of palate (9.75%, n-12), followed by parotid gland (8.13%, 10). Among the malignant tumour mucoepidermoid carcinoma was the most common finding (12.19%, n-15), followed by adenoid cystic carcinoma (3.25%, n-4). Mucoepidermoid carcinoma was predominantly found in minor salivary gland of palate (6.50%), followed by

parotid and submandibular gland 4.06% and 1.62% respectively (Table 3).

Table No.3: Distribution of Salivary gland tumours according to histopathology (n-123)

Type of tumour	Salivary Glands				
	Total (%)	Parotid (%)	Submand (%)	Palate (%)	Cheek (%)
Benign					
Pleomorphic adenoma	80 (65.04)	64 (52.03)	10 (8.13)	4 (3.25)	2 (1.62)
Myoepithelioma	8 (6.50)	2 (1.62)	4 (3.25)	-	2 (1.62)
Warthin's tumor	4 (3.25)	4 (3.25)	-	-	-
Oncocytoma	2 (1.62)	2 (1.62)	-	-	-
Basal cell adenoma	1 (0.81)	1 (0.81)	-	-	-
Total	95 (77.23)	73 (59.34)	14 (11.38)	4 (3.25)	4 (3.25)
Malignant					
Mucoepidermoid carcinoma	15 (12.19)	5 (4.06)	2 (1.62)	8 (6.50)	-
Adenoid cystic carcinoma	4 (3.25)	1 (0.81)	1 (0.81)	2 (1.62)	-
Carcinoma ex pleomorphic adenoma	2 (1.62)	2 (1.62)	-	-	-
Acinic cell carcinoma	3 (2.43)	1 (0.81)	1 (0.81)	1 (0.81)	-
Squamous cell carcinoma	2 (1.62)	1 (0.81)	1 (0.81)	-	-
Adenocarcinoma	2 (1.62)	-	-	1 (0.81)	1 (0.81)
Total	28 (22.76)	10 (8.13)	5 (4.06)	12 (9.75)	1 (0.81)

DISCUSSION

The major salivary glands are parotid, submandibular and sublingual and minor salivary glands are numerous located mainly on palate. Tumours may arise from major as well as minor salivary glands. Both benign and malignant tumours affect these glands irrespective of the age. In this study mean±SD age of the patients was 40±5.1 years (age range 7–76 years), coinciding Ashkavandi's⁶ study with age range from 5-83 years and mean age 41.8±16.7, and Shrestha's⁷ study with age range of 12-75 years and mean age of 44.76 years. We found male predominance in this study with male: female ratio of 1.9:1 simulating reports of Memon, Shrestha and Lawal with male: female ratio of 1.5:1, 1.7:1, 1.2:1 respectively.⁷⁻⁹ This male predominance cannot be explained based on results of this study. In this study most of the patients presented in 4th decade (28.45%, 35), followed by 2nd and 3rd decades which is in accordance with Kumar's¹⁰ study with majority of patients received in 2nd and 3rd decade (25.0%, 18.3%) and Souvagani's¹¹ study with maximum number of patients presented in 3rd and 4th decade (31.1%, 39.8%), while it is contradicting Lawal's⁹ report who found

majority of patients in late age of 5th to 6th decade (53.5%). In this study right side salivary glands were commonly involved (75.61%, 93) and parotid gland was commonly affected (68.29%, 84), which is supported by Shetty's¹² study where right side and parotid glands were commonly affected followed by submandibular. Similarly Oti¹³ reported that right salivary glands were the commonest (17.35%) affected glands, with parotid predominance (9.91%), and Wahiduzzaman's¹⁴ study where parotid gland was commonly involved (84.0%) followed by submandibular gland (16.0%). In this study the clinical features noted were slowly growing lumps for 1-5 years (66.66%, 82) with mean size of 7.3 ± 3.6 cm, firm on palpation (72.35%), with cervical lymphadenopathy, pain, fixity, tenderness and facial nerve palsy in 12.19% 11.38%, 10.56%, 7.31% and 6.50% respectively, which is consistent with study of Souvagini¹¹ who reported that mostly the tumours were slow growing lumps (80%), that was firm (86.66%) with associated facial paralysis (4.44%), hypoglossal nerve paralysis (2.22%), pain (33.33%), and muscle spasm (13.33%). Likely Wahiduzzaman¹⁴ found that clinical features were swelling (100.0%), pain (12.0%), facial nerve paralysis (6.0%) and palpable lymph node (10.0%). On histopathological examination among these tumours 95 cases (77.23%) were benign while 28 cases (22.76%) were malignant. Benign tumours were common in parotid gland (53.65%), followed by submandibular gland and palate i.e. 11.38% and 3.25% respectively. Pleomorphic adenoma was the commonest histopathological finding (65.04%, n=80), predominantly affecting parotid gland (52.03%). Our results are keeping with study of Etit D¹⁵ who reported that out of 235 cases, 146 (62.13%) were benign and 89 (37.87%) were malignant. Among the major salivary glands, parotid gland was affected 82.38%, followed by submandibular gland 17.62%. He also found that the two most common benign tumors were pleomorphic adenoma (n = 98; 67.12%) and Warthin's tumor (n = 31; 21.23%). Our results are also supported by Ashkavandi's⁶ result where benign tumours constituted 248 (67.8%) of all tumors, pleomorphic adenoma was the most common tumor comprising 54.3%, and these neoplasms tend to involve parotid and submandibular glands more frequently. Similarly Morais¹⁶ revealed that out of 303 epithelial salivary gland tumors, 215 (71%) were benign and 88 (29%) were malignant; pleomorphic adenoma was the most frequently found benign tumor primarily affecting the parotid. Likewise Souvagini¹¹ disclosed that benign tumours were frequently encountered in parotid (71%) followed by submandibular (4.5%) gland, whereas pleomorphic adenoma was the commonest benign tumour. However my results varies from Lawal's⁹ study who noted that out of 413 salivary gland tumours, 221 (53.5%) were malignant and 192 (46.5%) were benign. In his study

the overall incidence of malignancy was 22.76%, malignant tumour was common in minor salivary glands of palate (9.75%, n= 12), followed by parotid gland (8.13%, 10). Mucoepidermoid carcinoma was the most common malignant tumour (12.19%, n=15), followed by adenoid cystic carcinoma (3.25%, n=4). Mucoepidermoid carcinoma was predominantly found in minor salivary gland of palate (6.50%), followed by parotid and submandibular gland 4.06% and 1.62% respectively. Our results are at variance from that of Oti¹³ where malignant tumour was 28.1%, a total of 10 out of 38 tumours (26%) in the right parotid were malignant, while 36% tumours in the minor salivary glands were malignant of which 75% were located on the palate. The commonest malignant tumour was adenoid cystic carcinoma (13.22%). However regarding malignancy our results are in conformity with Wahiduzzaman¹⁴ who found that malignant tumours were 23.8%, mucoepidermoid carcinoma was the commonest malignant tumour affecting parotid gland (16.67%), while adenoid cystic carcinoma commonly affecting submandibular glands (50.0%). Similarly in Shrestha's⁷ study mucoepidermoid carcinoma was most common (38.1%) among the malignant salivary gland tumors. Parotid was the most common site of occurrence 26 (23.6%) for mucoepidermoid carcinoma followed by minor salivary glands 10 (9.0%) and submandibular gland 6 (5.4%). Submandibular gland was the most common site of occurrence for adenoid cystic carcinoma 14 (12.7%). In addition Souvagini¹¹ observed that overall malignancy was 20%, of which mucoepidermoid carcinoma was 44.4% and adenocystic carcinoma was 33.3% on palate and cheek. Our results are also consistent with Memon⁸ report where malignant tumours were 20%, parotid was commonly affected (87%) and mucoepidermoid carcinoma was 2.5%. Likely In shetty's¹² study mucoepidermoid carcinoma was 12.5% and adenoid cystic carcinoma was 8.9%

CONCLUSION

It is concluded that salivary gland tumours predominantly affecting middle aged male population. Benign tumours are the commonly occurring salivary glands tumours in long standing lumps arising from salivary glands. Pleomorphic adenoma is commonly occurring benign tumour affecting parotid gland commonly, while mucoepidermoid carcinoma is the commonest malignant tumour of salivary glands.

REFERENCES

1. Pons-Vicente O, Almendros-Marques N, Berini-Aytes L, Gay-Escoda C. Minor salivary gland tumors: A clinicopathological study of 18 cases. *Med Oral Patol Oral Cir Bucal* 2008; 13(9):582-8.

2. Pratap V, Jain SK. Sonographic evaluation of salivary gland tumors: a hospital based study. *Inter J Sci Study* 2014;1(4):32-6.
3. Nelson BL, Thompson LDR. Incisional or core biopsies of salivary gland tumours: how far should we go? *Diag Histopathol* 2012; 18(9): 358-65.
4. Ungari C, Paparo F, Colangeli W, Iannetti G. Parotid glands tumours: overview of a 10-years experience with 282 patients, focusing on 231 benign epithelial neoplasms. *Eur Rev Med Pharmacol Sci* 2008; 12: 321-5.
5. Dwivedi N, Agarwal A, Raj V, Chandra S. Histogenesis of salivary gland neoplasms. *Indian J Cancer* 2013; 50: 361-6.
6. Ashkavandi ZJ, Ashraf MJ, Moshaverinia M. Salivary Gland Tumors: A Clinicopathologic Study of 366 Cases in Southern Iran. *Asian Pacific J Cancer Prev* 2013; 14 (1): 27-30.
7. Shrestha S, Pandey G, Pun C.B, Bhatta R, Shahi R. Histopathological Pattern of Salivary Gland Tumors. *J Pathol Nepal* 2014; 4:520-24.
8. Memon JM, Sheikh B, Baloch I. Histopathological audit of salivary gland neoplasms. *ANNALS* 2014; 20(1): 81-4.
9. Lawal AO, Adisa AO, Kolude B, Adeyemi BF, Olajide MA. A review of 413 salivary gland tumours in the head and neck region. *J Clin Exp Dent* 2013; 5(5): 218-22.
10. Kumar SY, Permi HS, Parame SH, Kishan, Prasad HI, Teerthanath S, et al. Role of Fine Needle Aspiration Cytology in Salivary Gland Tumours in Correlation with Their Histopathology: A Two Year Prospective Study. *J Clin Diag Res* 2011; 5(7): 1375-80.
11. Souvagini A, Prusty N, Guru RK, Panda S. Clinicopathological study of salivary gland tumours. *Inter J Cur Res* 2013; 5(4): 868-70.
12. Shetty A. Geethamani V. Spectrum of major salivary gland tumours: Clinicopathological Study. *Sch J App Med Sci* 2014; 2(3): 1088-90.
13. Oti AA, Donkor P, Yeboah SO, Owusu OA. Salivary gland tumours at Komfo Anokye Teaching Hospital, Ghana. *Surg Sci* 2013; 4:135-9.
14. Wahiduzzaman M, Barman N, Rahman T, Uddin ME, Islam MT, Bhuiyan MZR. Major salivary gland tumors: a clinicopathological study. *J Shaheed Suhrawardy Med Coll* 2013; 5(1): 43-5.
15. Etit D, Ekinci N, Tan A, Altinel D, Dag F. An analysis of salivary gland neoplasms: a 12-year, single-institution experience in Turkey. *Ear Nose Throat J* 2012; 91(3): 125-9.
16. Morais MLSA, Azevedo PR, Carvalho CH, Medeiros L, Lajus T, Costa ALL. Clinicopathological study of salivary gland tumors: an assessment of 303 patients. *Cad Saude Publica Rio de Janeiro* 2011; 27(5): 1035-40..

Effectiveness of Non-Mesh (Shouldice) Versus Mesh (Lichtenstein) Repair in Inguinal Hernia

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ABSTRACT

Objective: To evaluate the optimum method of repair for inguinal hernia with respect to low rate of recurrence, minimum postoperative pain and cost effectiveness.

Study Design: Retrospective and Comparative study.

Place and Duration of Study: This study was conducted between 2004-2007 in the surgical department DHQ Hospital Karak from .

Materials and Methods: Either 320 patients were randomly allotted to mesh or non-Mesh repair. They were followed up at the 1st week and then 1, 6, 12, 18, 24 and 36th month. Clinical outcome that is, recurrence rate, quality of life, Post-operative pain etc were noted.

Results: After 3 year, the recurrence rates were significantly different for the two types of repairs.

Conclusion: The Shouldice is usually suited in primary and unilateral inguinal hernial repair in adult males. In addition, The Lichtenstein is best for bilateral and recurrent inguinal hernial repair in old patients (>60Yrs) and in elective states of repair.

Key Words: Shouldice, Lichtenstein, Inguinal Hernia

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INTRODUCTION

The Shouldice procedure is performed in 4 layers (Glassow)^[1]. After herniotomy, the fascia transversalis is cut horizontally, starting at the stretched deep inguinal ring and proceed medially to the pubic tubercle, safeguarding the inferior epigastric vessels. The upper and lower flaps of fascia transversalis are formed. The lower flap is stitched to the under surface of the upper flap and the upper flap is stitched to the upper surface of the lower flap with 2/0 prolene. The conjoint tendon and the lateral fleshy part of the internal oblique and transversus abdominus are stitched to the enrolled edge of inguinal ligament in two layers with 2/0 prolene. Finally the external oblique is stitched over the cord with catgut 1. Mesh (the Lichtenstein) repair for inguinal hernia: This is the open method of reinforcement of the posterior inguinal wall by placing and fixing a synthetic Marlex or polypropylene mesh of various

sizes. The inguinal hernia repair is the oldest and the most commonly performed operation by general surgeon all over the world ^[2]. Decreased rate of

recurrence is highly desirable as failure imposes great economic burden and psychological trauma to the patient. The recurrence rate for the non mesh i.e. *shouldice* varies between 0.2-15% depending upon the experience of surgeon, the length of follow up, wound infection, wound seroma or haematoma formation, family history, bilaterality, associated with other hernia, age, diabetes, steroids treatment, smoking, obesity, chronic cough, constipation and prostatism etc. Lichtenstein, is the open method of placement of polypropylene / Marlex mesh, is the tension free repair and was introduced by Lichtenstein et al in 1989 ^[3-4-5]. It was for the first time performed under local anesthesia and has the lowest recurrence rate in the long term. It takes less time to perform, easy to learn and with a fewer recurrences.

MATERIALS AND METHODS

Patients were operated either by Lichtenstien or Shouldice method. The treatment protocol was that at the time of induction of anesthesia, a single dose of broad spectrum anti-biotic IV given. General Anesthesia was used for 75% of cases, Spinal Anesthesia was used for 20% of cases and Local Anesthesia was used for 5% of cases. Non-Mesh (the Shouldice), the suture repair, was done with 2/0 prolene

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while Mesh repair the (Lichtenstein), was done with prolene mesh of variable sizes.

RESULTS

Patients were followed up at the first week then at 1, 6,12,18,24 and 36th months. A total of 320 cases were operated for inguinal hernia.

Surgical Techniques:

1. Mesh (Lichtenstien) Repair: Done for 70 cases.
 2. Non Mesh (Shouldice) Repair: Done for 150 cases.
- Recurrence (Table 1):

Table No.1: Patients with primary and unilateral inguinal hernia.

Total Patients	220
Age	25-65 Years
Average	45
Male	150
Female	70
M-F	3:1

For Non Mesh Repair: 3 recurrences out of 150.

Recurrence rate: 2%.

For Mesh Repair: 1 recurrence out of 70.

Recurrence rate: 1.4%.

Out of these 100 patients, 20 patients were with bilateral inguinal hernia making a total of 120 operations and the remaining 80 patients were with recurrent inguinal hernia (Table 2).

Table No.2: Patients with Bilateral & Recurrent Inguinal hernia

Total Patients	100
Age	35-85Yrs
Average	60 Yrs

Surgical Techniques:

1. NON-MESH (Shouldice) Repair:

10 patients with bilateral inguinal hernia and 30 patients with recurrent hernia, making a total of 50 operations.

2. MESH (Lichtenstein) REPAIR:

10 patients with bilateral inguinal hernia and 50 pts with recurrent inguinal hernia, making total 70 operation.

Recurrence:

1. FOR NON-MESH (the Shouldice) Repair:
3 recurrences out of 50.

Recurrence rate: 6%

2. MESH (the Lichtenstein) Repair: 2 recurrences out of 70.

Recurrence rate: 2.8%

Patient under gone for either Shouldice or Lichtenstein procedures were usually discharge within 24 to 48hrs if they did not develop complications.

DISCUSSION

We see from the results of the recurrences that the difference between Mesh (Lichtenstein) repair and the non Mesh (Shouldice) repair is not marked for unilateral and primary inguinal hernia, while this difference is quite marked for bilateral and recurrent inguinal hernia. This shows that Lichtenstein repair is the best and superior for bilateral and recurrent inguinal hernia, while the Shouldice repair is best for unilateral and Primary Inguinal Hernial Repair. Furthermore, there is an increasing number of Published mesh related complications and complaints such as; dislocation, fistula formation, sperm granuloma, paraesthesia, azospermia, wound infections, post operative pain and cost ineffectiveness^[6-7]. Lichtenstein repair for primary inguinal hernia in young patients is not universally approved of by the specialists^[8-9]. Until the last decade, the Shouldice procedure (1945) was used for inguinal hernia and was regarded as the standard procedure for inguinal hernia in Europe [10]. In Shouldice clinic at Toronto, the rate of recurrence was less than 1%, while multi-centric randomized trial has reported a recurrence rate between 6 -15% on long term basis^[11]. In suture repair, the suture line tension(causing ischemia) is responsible for recurrence and post operative pain. In the Classic Shouldice, the suture line tension is the least while in Bassini's repair; the suture line tension is the highest^[12]. Although the Lichtenstein procedure for inguinal hernial repair gives the lowest recurrence rate but it is the Shouldice which is most commonly perform for inguinal hernial repair^[13]. The low rate of recurrence reported by the Shouldice clinic could not be achieved at other non specialized centers. In randomized controlled study, the long term (10-15 years) rate of recurrence for Shouldice repair was 10-15%^[14]. Lichtenstein repair gives immediate strength to tissue and with passage of time, a double layer is formed. In UK, Lichtenstein repair is popular as it gives the lowest recurrence rate on long-term basis^[15]. Early post operative pain was present in both the procedures but chronic pain and wound infection was more common in the Lichtenstein procedure. Miedema et al, has reported a higher incidence of chronic pain after Lichtenstein repair compared with Shouldice repair (38% versus 07% $P < 0.001$)^[16-17-18-19]. Wound infection was present in 4-6% of cases in the Shouldice procedure while it was 8-10% in the Lichtenstein procedure in our study. Lichtenstein repair is superior for inguinal hernial in the following conditions: -

1. Bilateral and recurrent inguinal hernia.
2. In old patients with stretched, weak and deficient musculature in the groin.
3. When the hernia size is more than 3cms.

4. It should be performed in a good condition of sterilization and should be covered with pre and Post operative antibiotics.

Shouldice Repair is a Gold Standard for primary and unilateral inguinal hernial repair in adult males. It is relatively simpler and the most commonly performed operation for inguinal hernia now a day ^[20-21].

CONCLUSION

1. The Shouldice is usually suited in primary and unilateral inguinal hernial repair in adult males.
2. The Lichtenstein is best for bilateral and recurrent inguinal hernial repair in old patients (>60Yrs) and in elective states of repair.

REFERENCES

1. Glassow-F. The Shouldice Hospital technique. *Int Surg* 1986;71:148-53.
2. Isacsons DP, Hansen MV. Randomised study of Lichtenstien compared with Shouldice for inguinal hernia repair. *Eur J Surg* 1999; 165:49-53.
3. Lichtenstein IL, Shulman AG. Introducing a new concept of tension free hernial repair. *Int Surg* 1986;71:1-4.
4. Lichtenstein IL, Schulman AG, Amid PK. Critical Scrutiny of the open tension free Hernioplasty. *Am J Surg* 1993;165:369-71.
5. Amid PK, Alex G, Schulman AG. Lichtenstein, the open tension free repair of inguinal hernia. The Lichtenstein Technique. *Eur J Surg* 1996;162: 447-453.
6. Beet GL, van Geldere D, Baeten CG, Go PM. Long term results of giant prosthetic reinforcement of the posterior inguinal wall for complex recurrent inguinal hernia. *Br J Surg* 1996; 83:203-306.
7. Nowak DD, et al. Large Scrotal Hernia a complicated case of mesh migration, ascites and bowel strangulation. *Hernia* 2005;9: 96-99.
8. Schunpelick V. Does every hernia demand a Mesh repair? A critical review. *Hernia* 2001;5:5-8.
9. Heise CP, Straling JR. Mesh inguinodynia, a new clinical Syndrome after inguinal herniopalsty. *J Am Coll Surg* 1998;187:514-518.
10. Bendavid R. New Techniques in hernia repair. *World J Surg* 1989;13:522-531.
11. Kingsnorth AN, Mr G. Nott DM. Prospective randomized trial comparing the Shouldice and Bassini for inguinal hernia. *Br J Surg* 1992;79: 1068-1070.
12. Paul A, et al. Randomized trial of Bassini versus Shouldice for inguinal Hernial repair. *Br J Surg* 1994;81:1531-4.
13. Barth RJ, et al. Short term out come after Mesh or Shouldice herniorrhaphy. *Surg* 1998;123: 121-126.
14. Beetls, et al. Long term follow up (12-15 years) of a randomized controlled trial eliciting the results of Shouldice. *Am Coll Surg* 1977;185: 352-357.
15. Lichtenstein IL, et al. The tension free hernioplasty. *Am J Surg* 1989;157:188-93.
16. Miedema, et al. A prospective trial of inguinal hernia repair by surgical trainees. *Hernia* 2004;8: 28-32.
17. Codon RE. Groin pain after hernia repair. *Ann Surg* 2001; 233: 8.
18. Callesen T, Bech K, Kehlet H. Prospective study of chronic pain after groin herniorrhaphy. *Br J Surg* 1999; 86: 1528-31.
19. Taylor SG, O'Dwyer PJ. Chronic groin sepsis following tension free inguinal hernioplasty. *Br J Surg* 1999; 86: 562-5.
20. Hay JM, et al. Shouldice Hernial repair in Male Adults, the Gold Standard. *Ann Surg* 1995; 222: 719-27.
21. Prior MJ, et al. Randomized controlled trial comparing Lichtenstein with Shouldice repair for inguinal hernia. *J R Coll Surg Edinb* 1998;43: 82-719.

Prevalence of Pan, Gutka, Betalnut, Naswar and Cigarette Smoking in University Students of Karachi

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ABSTRACT

Objective: To evaluate prevalence of pan, gutka, betal nut, niswar and cigarette addiction among students of different universities and to be familiar with perception of people about addiction and smoking free public places.

Study Design: Cross-sectional study

Place and Duration of Study: This study was carried out at three different universities of Karachi, i.e. Karachi University, NED University & Sindh Medical University, Karachi from 10.08.2012 to 05.01.2013.

Materials and Methods: A cross-sectional study conducted with a total of 537 students aged between 18-28 years from three different universities of Karachi. A questionnaire was given to them containing 28 close ended questions about addiction of pan, gutka, betel nut, naswar and tobacco.

The data obtained was analysed by using SPSS version 17.

Results: The results showed 67.5% (361) were males and 32% (171) were females. The prevalence of addiction of pan, gutka, betal nut, Naswar and cigarette smoking is higher among males than in female university students. Addiction of betal nut is found 41.55% in males and 12.86% in females. There were 71.1% males and 72.5% females in complete favor of smoke free public places.

The perception about addiction was 5.62% of the males and 0.585% of the females feel that it's good About 56.5% of the males and 84.79% of the females note that it's deleterious to health.

Conclusion: Most popular addiction is of betal nut. Many people think that public places should be smoked free. Most of them are aware of the deleterious effect of addiction to health and tried to quit but failed. Hence, it is suggested that some awareness program about quitting modalities should be introduced.

Key Words: Addiction, Awareness, Pan, Gutka, Betalnut, Naswar, Smoking

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INTRODUCTION

We live in a culture in which mass advertising glorifies excessive consumption and the near instant gratification of desires, unfortunately, proves to be a slippery slope for millions, and uninhibited desires prove to be like an uncontrollable fire, growing stronger each time they are fed. Some desires become overriding compulsions that could take years to overcome, if at all. The word addiction is often used to describe such a condition. Many studies have shown correlation between prolonged usage of smokeless tobacco, betel, areca, gutka with oral submucous fibrosis, oral cancers, leukoplakia and other head and neck malignancies.¹ Some traces of metals were found in supari, gutka, pan, mainpuri, mawa and sweet supari.¹

According to the National Institute on Drug Abuse,

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"Addiction is a chronic disease with genetic, environmental and behavioral factors contributing to its cause, manifestations and natural history."¹

Worldwide 58% of the total head and neck cancers occur in South and Southeast Asia.²

In Pakistan, 8.5 to 10 times increased risk of oral cancers because of chewing tobacco, eating pan, gutka, betel nut.² One of the study reveals that, in Karachi only, 21% men and 19.3% females are suffering from oral cavity cancer, 7% of primary school children eat gutka and 96% women living on coastal area of Karachi consume gutka while they breastfeed their child.¹ Smoking, alcohol consumption and chewing of betel quid (consists of mixture of areca nut, slaked lime, catechu and other condiments wrapped in betel leaf) are the predominant cause of oral cancer. The precancerous lesions caused by these gutka and pan masala has a high rate of malignant transformation and is extremely devastating with no cure.³ The emerging epidemic of oral submucous fibrosis has been credited to chewing of areca nut and its mixture. Chewing of betel quid with or without tobacco aggravates asthma and predispose the

users to diabetes mellitus. And it has been evident that chewing of tobacco cause increased incidence of still birth and low birth weight.⁴ it has also been evident that usage of habitual gutka cause severe oral mucosal disorders which may extend beyond the oral cavity.⁵

Worldwide of the population Areca nut is the fourth most commonly used as psychoactive substance. Areca nut chewing with sweeteners is also very common in Western Pacific, South and South East Asian countries like Pakistan and India. Areca nut (Chalia, supari) is culturally acceptable in Pakistan. Pan masal originated from India in 1970's and became available in Sub-Continent.⁶ it is increasingly popular in school going children.⁶ Betel nut is the second most common carcinogen consumed in sub-continent. A study revealed 72.7% of the school children were habitual users of betel nut.⁷ Another study stated that oral cancers among low-income salary families increased 200% during the period from 1998 to 2002.⁷ Around 390,000 oral and oropharyngeal cancers occur annually in the world, 228,000 (58%), cases occur in south and South East Asia.⁸ More East Asian communities emerged in UK, Africa Australia, China and United States.⁹ Tumbaku and naswar mainly contain tobacco, Tumbaku is chewable while naswar is placed in oral vestibule. Some other studies in Karachi showed higher usage of these substance in boys than girls.¹⁰ Worldwide around 600 million now use some form of this substance.¹⁰

Such endeavors can help in developing policies to implement focused intervention.¹⁰

With this background, this study was conducted with the objective of determining the prevalence of cigarette smoking and smokeless tobacco among Pakistani students from three different universities in Karachi.

MATERIALS AND METHODS

This was a descriptive (Cross-sectional) study conducted in three universities i.e., Karachi University, NED University & Sindh Medical University. The sample Size was 537 and the technique used was non-probability Convenience Sampling.

Questionnaire was developed, data was collected. The group was divided into three sub groups. After taking verbal consent, a structured questionnaire was given to students containing 28 close ended questions relevant to addiction and smoke free public places. Data was analyzed using SPSS version 17.

RESULTS

A total of 537 students were presented with a questionnaire out of which 67.5% (361) were males and 32% (171) were females. The prevalence of addiction to Pan, Chali (betal nut), Niswar, Cigarette and Gutka in 3 different Universities were; K.U. = 54.7% (293), JSMU. = 30.8% (165) and N.E.D. = 14.4% (77).

The prevalence of addiction among males was found to be 51.8% (187) while 48.1% (174) did not report addiction to the aforementioned articles (Pan, Chali (betal nut), Niswar, Cigarette and Gutka). The prevalence of addiction amongst females was found to be 12.28 (21) while 87.7% (150) Pan, Chalia (betal nut), Niswar, Cigarette and Gutka did not report addiction to the aforementioned articles.

Table No.1: Prevalence of addiction

Prevalence	Frequency		Percentage	
	Male	Female	Male	Female
Yes	187	21	51.8%	12.28%
No	174	150	48.1%	87.7%

Table No.2: Age of start of addiction

Prevalence	Frequency		Percentage	
	Male	Female	Male	Female
Less than 10 yrs	18	0	9.62%	0%
10-15 yrs	34	1	18.18%	4.7%
15-20 yrs	63	1	33.6B%	4.7%
20 yrs and above	23	1	12.2%	4.7%

Table No.3: Perception about smoke free public places

Prevalence	Frequency		Percentage	
	Male	Female	Male	Female
Definitely yes	257	49	71.1%	72.5%
Probably yes	49	18	13.5%	10.5%
Definitely no	18	16	4.9%	9.3%
Probably no	4	1	1.1%	0.58%
I don't know	18	2	4.9%	1.1%

Table No.4: Perception and addiction

Prevalence	Frequency		Percentage	
	Male	Female	Male	Female
It's a good habit	19	1	5.26%	0.585%
No harm in doing so	61	4	16.89%	2.335%
Deleterious to health	204	145	56.50%	84.79%
I don't know	44	5	12.12%	2.93%

Betalnut addiction in males were 41.55% and 12.86% in females. Pan was 20.75% in males and 1.75% in females. For gutka it is 41.5% in males and 0.58 % in females. Cigarette is 31.3 % in males and 0 percent in females. Niswar is 4.98% in males and 0 % in females. There were 71.1% males and 72.5% females in complete favor of smoke free public places.

The perception about addiction was 5.62% of the males and 0.585% of the females feel that it's good, whereas 56.5% of the males and 84.79% of the females note that it's deleterious to health. 16.89% of the males and

2.335% of the females feel that there is no harm and 12.12% of the males and 2.93% of the females have no opinion on the matter.

Table No.5: Reasons for starting addiction

Prevalence	Frequency		Percentage	
	Male	Female	Male	Female
It's a good habit	19	1	5.26%	0.585%
No harm in doing so	61	4	16.89%	2.335%
Deleterious to health	204	145	56.50%	84.79%
I don't know	44	5	12.12%	2.93%

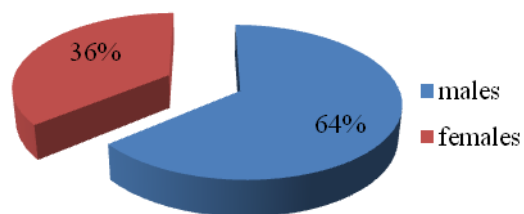


Figure No.1: Gender Distribution

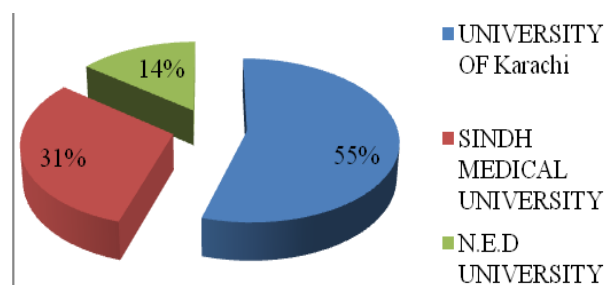


Figure No.2: University Distribution

Out of total participants, 52.9% of males and 9.5% of females practice their addiction in public. There were multiple reasons found in starting eating and getting addicted to Pan, Chalia (betel nut), Niswar, Cigarette and Gutka, 9% males started this as a fashion symbol, 41.1% males and 14.2% started because of peer pressure, while 9.6% males got addicted for pleasure.

DISCUSSION

The variables in this study were selected based on findings from high income countries which suggested that the smoking status of young adult's family members and friends, as well as no restrictions in private and public spaces may be related to addiction initiation, consumption, and cessation. This study shows that prevalence of addiction among university students of Karachi is very high with 67.5% among males and 32% among females.

When individual articles were searched we came to know that betel nut was the most common source of addiction being 41.55% in male and 12.86 among females. The cause that the factor which contributed

most towards addiction was being offered by friend. Others being pleasure, fashion and stress. Addiction for seeking pleasure and family problems were also culprits, in a research it was noticed that students are motivated by their friends.

According to our research there is no relation between father's income and addiction because most of students spend their own money getting by private tuitions.

According to our study most of the male students started their addiction between the ages of 15-20 years while most of the female students started their addiction above 10 years of age. According to a research, It is reported that majority of the respondents started smoking at age of 15-20 years which is same as our study.(12,13)

According to our study 2.6% of Males and 4.5% have tried to quit their addiction while 45.5% of Males and 14.2% of Females have not. In a research it was found that most students (82%) who had ever smoked daily had tried to quit.(14,15)

The points that should be noted and was a source of comfort was that majority of students consider addiction deleterious to health. Majority of students spend just less than 100rs on addiction.

CONCLUSION

Most popular addiction is of betel nut both among males and females students. Many people believe that public places should be smoke free. Most of them are aware of the fact that addiction is deleterious to health and tried to quit but got failed due to improper guidance. Hence it is suggested that some awareness program about quitting modalities should be introduced.

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REFERENCES

1. Kamal R. Gutka: Taste for the toxic. The Express Tribune, March 21st, 2012. [Cited 2014 August 21]. Available from <http://tribune.com.pk/story/352654/gutka-taste-for-the-toxic/>
2. Baig S, Lucky MH, Qamar A, Ahmad F, Khan S, Ahmed W, et al. Human Papilloma Virus and Oral Lesions in Gutka Eating Subjects in Karachi. JCPSP 2012;22(3): 135-8.
3. Nair U, Bartsch U, Nair J. Alert for an epidemic of oral cancer due to use of the betel quid substitutes gutkha and pan masala: a review of agents and causative mechanisms. Mutagenesis. 2004;19(4):251-62.

4. Imam SA, Nawaz H, Sepah YJ, Pabany AH, Ilyas M, Ghaffar S. Use of smokeless tobacco among groups of Pakistani medical students – a cross sectional study. BMC Public Health 2007;7:231.
5. Javed F, Chotai M, Mehmood A, Almas K. Oral mucosal disorders associated with habitual gutka usage: a review. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontics 2010;109(6):857–864.
6. Shah S, Qureshi R, Azam I. Is Chaalia/Pan Masala harmful for health? Practices and knowledge of children of schools in Mahmoodabad and Chanesar Goth, Karachi. JPMA 2009; 59:550.
7. Khan MS, Bawany FI, Shah RS, Hussain M, Nisar N, Arshad MH. Comparison of knowledge, attitude and practices of betelnut users in two socio-economic areas of Karachi. JPMA 2013; 63: 1319.
8. Changrani J, Gany F. Paan and Gutka in the United States: An Emerging Threat. J Immigran Health. 2005;7(2):103-7.
9. Blank M, Deshpande L, Balster RL. Availability and characteristics of Betel product in US. J Psychoactive Drugs 2008; 40(3): 309–313.
10. Mazahir S, Malik R, Maqsood M, Ali K, Merchant R, Malik F, et al. Socio-demographic correlates of betel, areca and smokeless tobacco use as a high risk behavior for head and neck cancers in a squatter settlement of Karachi, Pakistan. J of Substance Abuse Treatment Prevention and Policy 2006;1:10.

Outcome of Femoral Neck Fracture Treated by Austin –Moore Hemiarthroplasty in Elderly Patients

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ABSTRACT

Objective: To determine postoperative complications including with ambulation improvement and condition in elderly patients with fracture neck of femur treated by Austin-Moore hemiarthroplasty during 6 months period postoperatively at Peoples medical university Hospital Nawabshah.

Study Design: Descriptive case series study.

Place and Duration of Study: This study was carried out at Peoples Medical University Hospital Nawabshah and Liaquat University Hospital Hyderabad from July 2012 to July 2014.

Materials and Methods: Total 100 elderly patients with femoral neck fracture with the age of above 60 years were included in the study. The patients were followed for a period of 6 months postoperatively and all the postoperative complications were documented in the proforma.

Results: This study was contains total of 100 elder patients with femur neck fracture majority of male 72%. Most common 69% age group of the elder patients was 60 – 69, years of the age. Fractures were present 55% on the left sides while 45%. Majority of the cases were found with co morbidities 58%, and according to the post operative complications wound problem was found most common 21% along with implant infection 9%, 2nd most common complication was bed sore 11%. On the outcome excellent results were found 32.60%, good results were 42.70%, while fair and poor results were as 16.30% and 8.40% respectively. While 17%, death was recorded during 6 month of postoperative time.

Conclusion: Austen Moore Hemiarthroplasty is the good surgical technique of the management for the fracture of the femur. It is very cost effect treatment along with very small amount of morbidity and mortality.

Key Words: Femoral fracture, Austin-Moore hemiarthroplasty.

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INTRODUCTION

Neck of femur is the commonest site of fracture in the elderly.^{1,2} Femoral fractures are not easy to manage, and also results after treatment not completely satisfactory till nowadays.^{2,3} Most of the fractures occur in elderly patients due to minor to moderate trauma while theses fractures in younger patients usually resulting due to high energy trauma. Fracture NOF is associated with considerable morbidity and higher mortality than the general population. It can be complicated by immobilization, skin breakdown, pulmonary and bowel dysfunction, disorientation, deep vein thrombosis, avascular necrosis and nonunion^{4,5}. The mortality at one year range from 14 to 48% in different studies^{4,6,7}

In 1942 when metallic implants like Austin Moore Prosthesis replaced the head, the problems of avascular necrosis and nonunion were improved. The patients get early mobilized and complications due to prolonged

immobilization reduced. Treatment of fracture of the femoral neck has been contentious throughout the years, with several opinions assortment from decrease and internal fixation to moreover a incomplete “hemiarthroplasty” or total “total hip replacement”, whereas prosthesis should be cemented or uncemented and or it should be unipolar or bipolar.^{8,9} Displaced intracapsular treatment of neck fracture of the femur in functionally active cases remains a matter of hot discuss. The management include internal fixation for a displaced fracture, hemiarthroplasty or total hip Arthroplasty for elderly patients with displaced fracture and open reduction and internal fixation is preferred in young patients.¹⁰ The important factors considered in selecting various treatment modalities are age of patient, his general medical condition, type of fracture, availability of facilities and socioeconomic condition of patient. It is (Austin- Moore hemiarthroplasty) not suggested to undisplaced fracture of the femur neck, for the reason that mortality is increased.¹¹ It is associated with increased risk of subsequent revision in younger patients. It has acceptable long-term results, relatively inexpensive and avoids disadvantages of using cement.^{12,13} Life expectancy is increased and our society in

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becoming more and more geriatric. Quantity of cases having femoral neck fractures are raising as a squeal. This has a tremendous impact on public health policy, the health care system and society in general.¹⁰ Review of literature showed few studies on mortality and morbidity in hip fractures in Pakistan. Recently and in the coming years the elderly population is bound to increase, hence early planning for the future could help in the proper management of the elderly patients. Procedure of "Austin-Moore hemiarthroplasty" is usually carried out mostly in all hospitals of Pakistan. But the long term results have not been reported previously.^{9,14} Therefore the purpose of this study to evaluate the outcome including; postoperative complications, ambulatory status, and mortality in elderly patients with displaced fractures of femoral neck and were treated by Austin-Moore hemiarthroplasty.

MATERIALS AND METHODS

This descriptive case series study was carried out prospectively in Orthopaedic department of Peoples medical university Hospital Nawabshah and Liaquat University Hospital Hyderabad, with the duration of the time from the July 2012 to July 2014. Both male/female above the age of 60 years were included in the study. Patients will be admitted from the emergency and OPD department according to the inclusion and exclusion criteria. (Anesthesia assessment will be carried out by a senior anesthetist. Informed and written consent will be taken from the attendant of the patients who were included in the study for surgery. Prophylactic antibiotics were given. All the patients under went Austin-moor hemiarthroplasty treatment with use of femoral prosthesis Post operatively patient were mobilized on 1st or 2nd post operative day with the help of crutches or walker, along with range of motion exercises and quadriceps strengthening exercises. All the cases were discharged on 3rd and 4th day after operation. OPD follow up was carried out at 2 weeks for removal of sutures and then at 6th weeks and 6th month to record the all complications, by operating team members in OPD, on proforma. Contact on phone was done, if any patient fails to follow in OPD. All radiology was done at Radiology Department. After all of that, all postoperative complications, functional outcome and mortality were noted within maximum six month of the period and noted on written Proforma. Data was entered and analyzed by SPSS program version 16.

RESULTS

This study was contains total of 100 elder patients with femur neck fracture majority of male 72% patients were found in this study as compare to females 28%, most common age group of the elder patients was 60 - 69 years of the age while 22% cases were seen in the 70 -

79 years of age group and 9% of the cases were noted of 80 years and above, fractures were present 55% on the left sides while 45% were documented at right sides, mostly fractures were with the garden 3 type 65% and while 35% were with garden4 types. Table 1.

Regarding the postoperative mobility of the patients all patients were classified into five groups. 13% cases of group one who were mobilized on the first postoperative day. 30% cases of group 2 were mobilized on 2nd day and 30% Group 3 on 3rd day. 17% patients of group 4 those were in whom mobility took more than three days and 10% patients of group 5 were kept only bed to chair. Figure 1.

Majority of the cases were found with co morbidities 58%, and according to the post operative complications wound problem was found most common 21% along with implant infection 9%, 2nd most common complication was bed sore 11% results shows in Table 2.

On the outcome excellent results were found 32.60%, good results were 42.70%, while fair and poor results were as 16.30% and 8.40% respectively. Figure 2.

17% death was recorded during 6 month of postoperative time. Figure 3.

Table: No.1: Base LINE CHARECTERISTICS of the patients (n = 100)

Charecteristics	Number	Percentage
Gender Distribution		
Male	72	72.0%
Female	28	28.0%
Age Groups		
60 – 69	69	69.0%
70 – 79	22	22.0%
< 80	09	09.0%
Fracture Side		
Right	45	45.0%
Left	55	55.0%
Fracture according to Garden type		
Garden 3	65	65.0%
Garden 4	35	35.0%

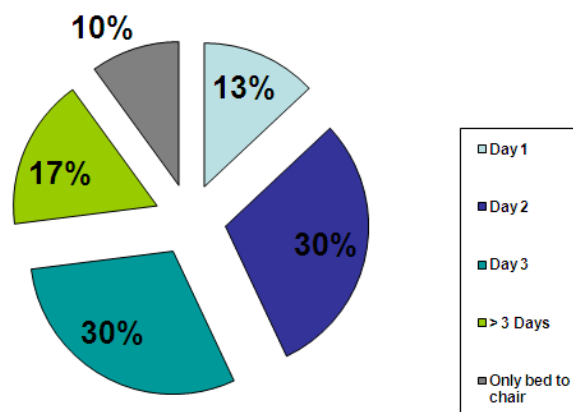
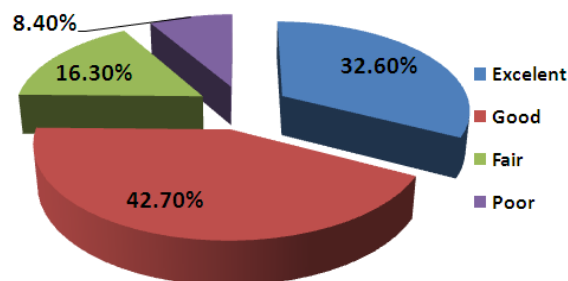
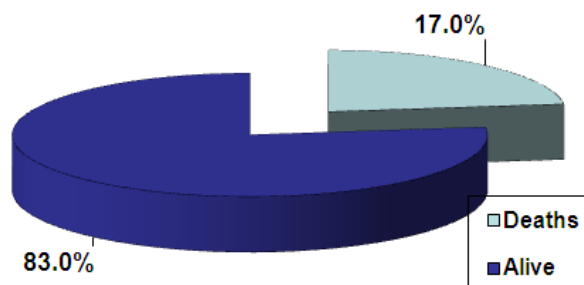


Figure No.1: Posoperative imbulation status in patients (n=100)

Table No.2: Postoperative complications in the patients. (n=100)

Complications	Number	Percentage
CO MORBIDITIES		
Yes	58	58.0%
No	42	42.0%
COMPLICATIONS		
Dislocation	05	05.0%
Wound problems	21	21.0%
DVT	02	02.0%
Bed sore	11	11.0%
Implant infection	09	09.0%
Periprosthetic fracture	01	01.0%
Acetabular protrusion	02	02.0%

**Figure No. 2: Outcome of the patients. n=81****Figure No.3: Total deaths record in postoperative 6 months duration (n=100)**

DISCUSSION

Neck fractures of the femur, is most important injuries in the elderly peoples, and with always obtainable big challenges to the surgeons of orthopaedic. The frequency of femoral fractures had raised with development in life expectation, and is predicrable to double in the next twenty years and triple within 2050.¹⁵ The purpose of fractures management of femoral neck is re-sestablishment of pre-fracture physiology lacking related morbidity.¹⁶ Experience of the last four decades has shown that hemiarthroplasty is the best treatment for intracapsular fracture neck of femur in elderly patients in condition of short-term results and long-term results.¹⁷

In the study of Jadhav AP et al,¹⁸ reported mean age 65.7, Once and Yinusa¹⁹ showed mean age in the study 67.4, in another study of Essoh J.B. Sié M.D et al reported range of the age 55-88 years with the

standered deviation of 7.2.²⁰ Similarly in this study most common age group of 69% of the elder patients was 60 - 69 years of the age while 22% cases were seen in the 70 - 79 years of age group and 9% of the cases were noted of 80 years and above. Ahmed et al,²¹ reported that ratio of male female, was 1:2. While in this study total of 100 elder patients with femur neck fracture majority of male 72% patients were found in this study as compare to females 28%.

In this study mostly fractures were with the garden 3 type 65% and while 35% were with garden4 types. While in a study performed by Essoh J.B. Sié M.D et al,²⁰ showed fracture types according to garden 32.1% patients with fracture grade III and 67.9% patients with grade IV.

In the present study postoperative mobility of the patients were classified into five groups. 13% cases of group one who were mobilized on the first postoperative day. 30% cases of group 2 were mobilized on 2nd day and 30% Group 3 on 3rd day. 17% patients of group 4 those were in whom mobility took more than three days and 10% patients of group 5 were kept only bed to chair. Generally round about 50% to 60% fracture of the hip, cases recover their pre-fracture status of ambulatory along with ano year.²² Frequency of the cases who achieve unaided community ambulation of (able to go outside home) has been stated as 11% to 30%.^{20,23} One study found that 30% of post surgery patients with cemented prostheses needed a higher level of walking aid than before injury; 60% of patients with uncemented prostheses needed similar assistance.²⁴ Uses of the walking stick was necessary in 17% to 62% of cases had uncemented prosthesis and 40% to 50% of cases had cemented prosthesis; walker uses was the necessary for 15% to 35% and 27% to 40% of cases..^{20,23}

In the present study majority of the cases were found with co morbidies 58%, and also dislocation was found 5% in our series. According to the study of Barnes CL et all,²⁵ dislocation rate was 1.5%. Other authors reported 4% dislocation rate.^{26,27} In the present series wound problem was found most common 21% along with implant infection 9%. Dinesh Dhar.²⁸ In general duration of operation has been proven conclusively to be a potent risk factor in the development of postoperative infection.¹³ Pahore M et al,²⁹ reported only 4% superficial infection.

In the present study excellent results were found 32.60%, good results were 42.70%, while fair and poor results were as 16.30% and 8.40% respectively. In the study of Anshu Shekhar et al³⁰ reported outcome of hemiarthroplasty treatment in patients with femoral neck fracture as, excellent 43.5%, good 38.4%, fair 11.3% and poor 6.8%. Dinesh Dhar et al²⁸ reported outcome of

of austen moor in femor neck fracture outcome excellent 80.2% and fair 19.8%. Noor SS et al³¹ reported outcome as, excellent 38%, good 21%, fair 24% and poor 17.3%. Pahore M et al,²⁹ reported that excellent results were found in the 44.44% of the study participants, good and satisfied results were seen with the percentage of 26.66% and 20% respectively, while poor results were seen in 8.88% of the patients.

In this series 19% death was recorded during 6 month of postoperative time. Mortality rate reported by Somashekar et al³² 9.5% in the patients treated with unipolar hemiarthroplasty and A haronoff GB et al³³ reported 11.77%. Essoh J.B. Sié M.D et al,²⁰ reported mortality rate 8.3% in the patients treated with Austin moor hemiarthroplasty. Mortality at six months is 13.5% overall³² and one year mortality rate following hip fracture surgery is remarkably high, and is usually around 26%.³⁴

CONCLUSION

In conclusion of this study Austen Moor Hemiarthroplasty is a better procedure for fractures of the femoral neck, that's provides the freedom from pain, very good results of ambulatory status. It is a good surgical technique including with very cost effect in price, along with very small amount of morbidity and mortality.

REFERENCES

- Canale ST. Campbell's operative orthopaedics. 11th ed. Philadelphia: Mosby; 2007. p. 2873-2938.
- Merchant RA, Lui KL, Ismail NH, Wong HP, Sitoh Y. The relationship between postoperative complications and outcome after hip fracture surgery. *Ann Acad Med Singapore* 2005;34: 163-8.
- Vertelis A, Petrusis A, Jermolajevs V. Treatment results of displaced femoral neck fractures. *Medicine* 2002;38(5): 89-93.
- Terai T, Henmi T, Kanematsu Y, Fujii K, Sakai T. Clinical evaluation of aged patients who underwent surgery for femoral neck fractures comparative study of clinical results according to age. *J Orthop Surg* 2002; 10(1): 23-8.
- Bucholz RW, Heckman JD. Fractures in adults. 6th ed. Philadelphia: Lippincott Williams & Wilkins; 2005. p. 1579-1634.
- Roder F, Schwab M, Aleker T, Morike K, Thon KP, Klotz U. Proximal femur fracture in older patients rehabilitation and clinical outcome. *Age Ageing* 2003;32: 74-80.
- Solomon L, Warwick D, Nayagam S. Apley's system of orthopedics and fractures. 9th ed. London: WB Saunders; 2007. p. 681-704.
- Singh GK, Deshmukh RG. Uncemented Austin-Moore and cemented Thompson unipolar hemiarthroplasty for displaced fracture neck of femur--comparison of complications and patient satisfaction. *Injury* 2006;37(2):169-74.
- Ahmad I. Mortality and morbidity in elderly patients with fracture neck of femur treated by hemiarthroplasty. *J Coll Physicians Surg Pak* 2006; 16(10):655-8.
- Wazir NN, Mukundala VV, Choon DS. Early results of prosthetic hip replacement for femoral neck fracture in active elderly patients. *J Orthop Surg (Hong Kong)* 2006;14(1):43-6.
- Sikand M, Wenn R, Moran CG. Mortality following surgery for undisplaced intracapsular hip fractures. *Injury*. 2004;35(10):1015-9.
- Norrish AR, Rao J, Parker MJ. Prosthesis survivorship and clinical outcome of the Austin Moore hemiarthroplasty: An 8-year mean follow-up of a consecutive series of 500 patients. *Injury*. 2006;37(8):734-9.
- Rogmark C, Carlsson A, Johnell O, Sernbo I. Primary hemiarthroplasty in old patients with displaced femoral neck fracture: a 1-year follow-up of 103 patients aged 80 years or more. *Acta Orthop Scand* 2002;73(6):605-10.
- Ahmad I. A study on mortality and morbidity in elderly patients with hemiarthroplasty, during one year postoperative follow up period. (Dissertation Orthopaedic Surgery) Karachi: College of Physicians and Surgeons Pakistan 2004.
- Schmidt AH, Swiontkowski MF. Femoral neck fractures. *Orthop Clin North Am* 2002;33(1): 97-111.
- Iorio R, Healy WL, Lemos DW, Appleby D, Lucchesi C, Saleh KJ, et al. Displaced femoral fractures in the elderly : outcomes and cost effectiveness. *Clin Orthop* 2001; 383: 229-242.
- Bhandari M, Devereaux PJ, Swiontkowski MF, Tornetta P, Obremskey W, Koval KJ, et al. Internal fixation compared with arthroplasty for displaced fractures of the femoral neck. *J Bone Joint Surg Am* 2003; 85-A:1673-1681.
- Jadhav AP, Kulkarni SS, Vaidya SV, Divekar MM, Suralkar SP. Results of Austin Moore replacement. *J Postgrad Med* 1996; 42:33-8.
- Onche II, Yinusa W. Femoral neck fractures: A prospective assessment of the pattern, care and outcome in an orthopaedic centre. *Nigerian J of Orthopaedics and Trauma* 2004; 3:42-9.
- Essoh JB, Sié MD, Aka D, et al. Austin Moore Hemiarthroplasty For Displaced Femoral Neck Fractures In Patients Aged 55 Years And Above. An Ivorian Experience. *NJOT* June 2006;5;1:8-13.
- Ahmad I. Mortality and morbidity in elderly patients with fracture neck of femur treated by hemiarthroplasty. *J Coll Physicians Surg Pak* 2006;16(10):655-8.

22. Finsen V, Benum P. Changing incidence of hip fractures in rural and urban areas of central Norway. *Clin Orthop Relat Res* 1987;(218):104-10.
23. Crock HV. An atlas of the arterial supply of the head and neck of the femur in man. *Clin Orthop Relat Res* 1980 Oct(152):17-27.
24. Zetterberg C, Elmerson S, Andersson GB. Epidemiology of hip fractures in Goteborg, Sweden, 1940-1983. *Clin Orthop Relat Res* 1984; (191):43-52.
25. Barnes CL, Berry DJ, Sledge CB. Dislocation after bipolar hemiarthroplasty of the hip. *J Arthroplasty* 1995;10:667-669.
26. Figved W, Norum OJ, Frihagen F, Madsen JE, Nordsletten L. Interprosthetic dislocations of the Charnley/Hastings hemiarthroplasty—report of 11 cases in 350 consecutive patients. *Injury* 2006; 37:157-161.
27. Figved W, Dybvik E, Frihagen F, Furnes O, Madsen JE, Havelin LI, et al. Conversion from failed hemiarthroplasty to total hip arthroplasty: a Norwegian Arthroplasty Register analysis of 595 hips with previous femoral neck fractures. *Acta Orthop* 2007;78:711-718.
28. Dinesh Dhar. Early Results of Austin Moore Prosthesis in Elderly Patients with fracture neck femur. *J Orthopaedics* 2007;4(1):e3 .
29. Ayub M, Dr. Pahore M, Maher I. Saeed M. Femoral neck fracture; outcome of unipolar hemiarthroplasty in elderly patients. *Profess Med J* 2014;21(5): 874-878
30. Shekhar A, Murgod G, Korlhalli S. Two years outcome of cemented Austin Moore hemiarthroplasty for fracture neck femur. *J of Dental and Med Sci* 2013; 11; 6:10-15.
31. Noor SS, Hussain N, Javed I. Outcome of Austin Moore hemiarthroplasty in elderly patients with fracture neck of femur. *J of Pak Orthopaedic Assoc* 2010; 22(1): 14-19.
32. Somashekar MS, Krishna SV, Sridhara Murthy JN. Treatment of Femoral Neck Fractures: Unipolar Versus Bipolar Hemiarthroplasty. *Malaysian Orthopaedic J* 2013;7;3:6-11.
33. Aharonoff GB, Immerman I, Zuckerman JD. Outcomes after hip fracture. *Tech Orthop* 2004;19:229-34.
34. Casaletto JA, Gatt R. Post-operative mortality related to waiting time for hip fracture surgery. *Injury* 2004; 35:114-20.

Prevalence of Different Refractive Errors and their Relation to Age and Sex in Patients Presenting in the Outpatient Department of Ophthalmology at Dow University of Health Sciences

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ABSTRACT

Objective: To see the prevalence of different refractive errors and their relation to age and sex in patients presenting in the Outpatient department of Ophthalmology at Dow University of Health Science.

Study Design: Cross sectional study

Place and duration of study: This study was carried out at the out-patient department of Ophthalmology Dow University of Health Science (OJHA campus), Karachi Pakistan from January 2011 to June 2011.

Materials and Methods: Total of 691 patients were included in the study. The testing and examination protocol included visual acuity measurement using Snellen and E chart after auto refraction, cycloplegic retinoscopy in children and examination of anterior segment and fundus in all patients.

Results: Mean age was 42.11 ± 17.35 years. Males were 323 and females were 368 in number. The most frequent refractive error was Myopia which was found in 153 (22.1%) patients and the second frequent refractive error was Myopic Astigmatism at a frequency of 148(21.4%);p value was 0.037.Thus Myopia and myopic astigmatism were the most frequent refractive error in age group ranging from 05-75 years.

Conclusion: In our study we found Myopia to be the most common refractive error (n=153 22.1%) followed by Myopic Astigmatism (n=148 21.4%). Myopia and Myopic Astigmatism were seen in males more than females while hypermetropia, hypermetropic astigmatism and mixed astigmatism were seen in more in females as compared to males.

Key Words: refractive error, myopia, myopic astigmatism

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INTRODUCTION

Uncorrected refractive errors are a common cause of visual impairment worldwide that can be prevented.¹World Health Organization introduced the global initiative for the elimination of avoidable blindness by the year 2020 known as "Vision 2020". An estimated 1.5 million children are blind worldwide of whom 1 million live in Asia.²Refractive errors which account mostly for low vision and visual handicap are the third largest cause of preventable/curable blindness in Pakistan.³ Correction of refractive error is cheap and effective with corrective spectacles and results in high functional improvement.⁴ People who access treatment for refractive error generally are not disabled thus it is the most important factor for the elimination of avoidable blindness.⁵

Myopia and hypermetropia are types of Refractive

errors that bring the focus of parallel rays of light entering the eye in front of, or behind the fovea respectively. Astigmatism occurs when the optical system is not symmetric about the optical axis, this aberration being due to irregular curvature of the cornea or the lens. The prevalence of the different types of RE vary considerably across different population groups and by age.

The onset of refractive error as compared to cataract is earlier and thus it can account for twice as many blind persons per year. It has severe social and economic effects on individuals and communities, restricting educational and employment opportunities of otherwise healthy individuals.⁶

Although numerous studies of refractive error have been performed, most were in settings of unknown representation, and because of different measurement methods and nonuniform definitions, comparisons of data are difficult.⁷The purpose of this study was to find the frequency of refractive errors in relation to age and sex and to further identify their types, suggest guidelines for early diagnosis and treatment and to promote general awareness.

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MATERIALS AND METHODS

In this study 691 patients visiting ophthalmology outpatient department of Dow University of health Science were evaluated from January 2011 to June 2011. History was taken in detail about duration of symptoms as well as their complaints regarding decrease in vision. The testing and examination protocol included visual acuity measurement using Snellen and E chart after auto refraction, cycloplegic retinoscopy in children and examination of anterior segment and fundus in all patients. The cycloplegic retinoscopy was performed such that 3 drops of cyclopentolate 1% were administered, 3 times, 5 minutes apart to each eye and after 45 minutes cycloplegic refraction was performed. Cycloplegic refraction was performed using a streak retinoscope in a semidark room.

Records of patients with any adnexal, anterior segment and posterior segment pathology were not included in the analysis. Records of patients less than five and more than eighty years were also excluded.

Data were collected by practicing optometrists and ophthalmologists experienced in the study

measurements and interview techniques. Data quality was insured via training of data collectors, supervision and cross-checking by supervisors. Data were entered into a computerized database using SPSS version 17.0. We applied chi-square test to study the relationship between Gender and Refractive error.

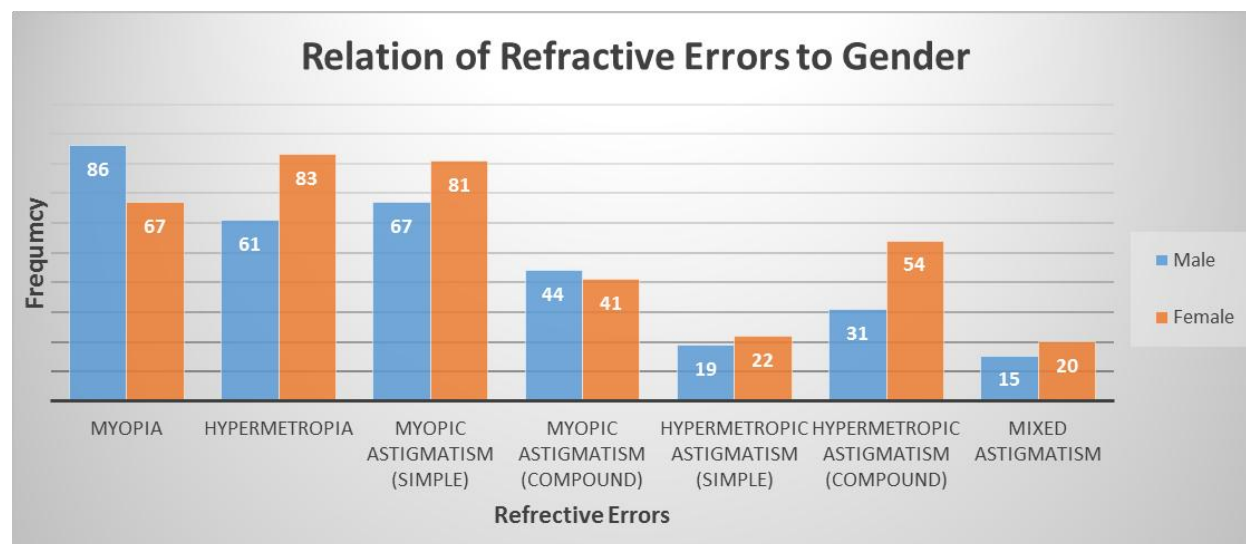
RESULTS

Total of 691 patients were included in the study. Mean age was 42.11 (SD 17.35). In age group 5-15 years there were 63 patients, in age group 16-30 years there were 130, 31-45 years age group had 179, 46-60 years age group had 223 and 61-75 years had 93 patients (Table 2). Out of 691 patients 323 were males and 368 were females. In males the most frequent refractive error was Myopia which was found in 86 (26.6%) while in females the most frequent refractive error was hypermetropia seen in 83 (22.6%). The second frequent refractive error in both sexes was Simple Myopic Astigmatism. In males it was seen in 67 (20.7%) individuals and in females it was found to be present in 81 (22.0%) individuals. The frequency of different refractive errors is given in Table 1.

Table No.1: Relationship of Refractive Errors to Gender

Gender	Refractive Errors							Total	P-value
	Myopia	Hypermetropia	Myopic Astigmatism (Simple)	Myopic Astigmatism (Compound)	Hypermetropic Astigmatism (Simple)	Hypermetropic Astigmatism (Compound)	Mixed Astigmatism		
Male	86 (26.6%)	61 (18.9%)	67 (20.7%)	44 (13.6%)	19 (5.9%)	31 (9.6%)	15 (4.6%)	323 (100.0%)	0.076
Female	67 (18.2%)	83 (22.6%)	81 (22.0%)	41 (11.1%)	22 (6.0%)	54 (14.7%)	20 (5.4%)	368 (100.0%)	
Total	153 (22.1%)	144 (20.8%)	148 (21.4%)	85 (12.3%)	41 (5.9%)	85 (12.3%)	35 (5.1%)	691 (100.0%)	

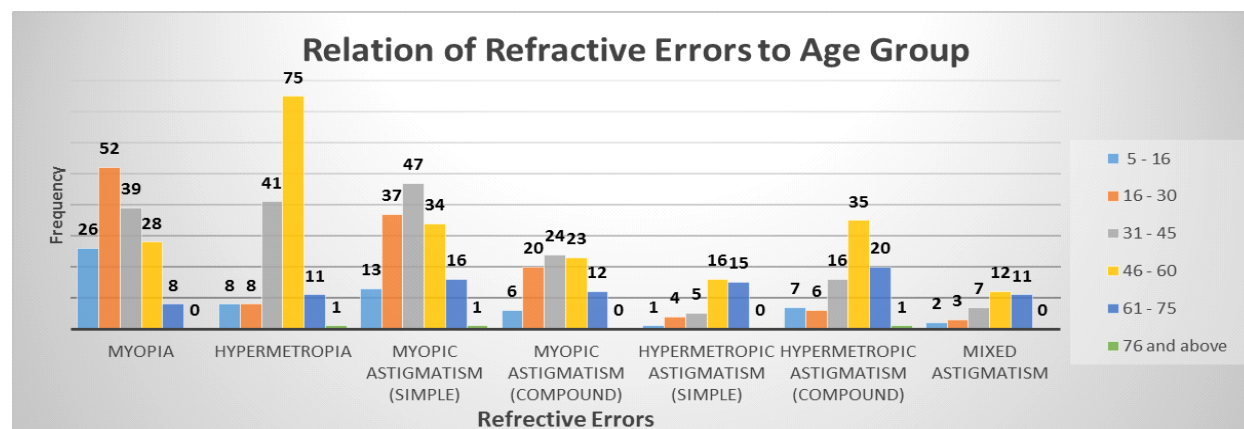
To see the relationship between Gender and Refractive errors we have applied Chi-square test and p-value suggest that there is no difference between male and female on the basis of refractive errors. It is nearly be associated if sample size increased.



Graph No.1: Relation of refractive errors to gender

Table No.2: Relationship of Refractive Errors to Age Group

Age Group	Refractive Errors							Total
	Myopia	Hypermetropia	Myopic Astigmatism (Simple)	Myopic Astigmatism (Compound)	Hypermetropic Astigmatism (Simple)	Hypermetropic Astigmatism (Compound)	Mixed Astigmatism	
5 – 15	26 (41.3%)	8 (12.7%)	13 (20.6%)	6 (9.5%)	1 (1.6%)	7 (11.1%)	2 (3.2%)	63 (100.0%)
16 – 30	52 (40.0%)	8 (6.2%)	37 (28.5%)	20 (15.4%)	4 (3.1%)	6 (4.6%)	3 (2.3%)	130 (100.0%)
31 – 45	39 (21.8%)	41 (22.9%)	47 (26.3%)	24 (13.4%)	5 (2.8%)	16 (8.9%)	7 (3.9%)	179 (100.0%)
46 – 60	28 (12.6%)	75 (33.6%)	34 (15.2%)	23 (10.3%)	16 (7.2%)	35 (15.7%)	12 (5.4%)	223 (100.0%)
61 – 75	8 (8.6%)	11 (11.8%)	16 (17.2%)	12 (12.9%)	15 (16.1%)	20 (21.5%)	11 (11.8%)	93 (100.0%)
76 and above	0 (0.0%)	1 (33.3%)	1 (33.3%)	0 (0.0%)	0 (0.0%)	1 (33.3%)	0 (0.0%)	3 (100.0%)
Total	153 (22.1%)	144 (20.8%)	148 (21.4%)	85 (12.3%)	41 (5.9%)	85 (12.3%)	35 (5.1%)	691 (100.0%)



Graph No.2: Relationship of Refractive Errors to Age Group

DISCUSSION

In this study we found the most frequent refractive error to be myopia seen in 153(22.1%) patients followed by simple myopic astigmatism seen in 148(21.4%) patients. this is in accordance with the study conducted by ayoob.m et al in which myopia and myopic astigmatism were found to be the most frequent refractive errors in age group ranging from 16-30 years i.e 39% and 51.1% respectively (p value 0.001)⁸. Another study stated that myopia appears to be more prevalent in pakistani adults (31.4%) than in western population i.e. 26.5% in beaver dam eye study; 17.6% in rotterdam study, 17.97% in the proyerto vision education and research, 16.76% in the baltimore study; 15.79% in the melbourne vision impairment project and 12.6% in the blue mountain eye study.⁹ A study conducted in rural china on individuals aged 30 years and above showed an overall prevalence of 26.7% of myopia which was followed by hypermetropia (15.9%), astigmatism (24.5%) and anisometropia (7.7%). It concluded that myopia affected more than one quarter of rural Chinese persons aged > 30 years of age.¹⁰

Refractive error and age: According to John H kempen et al with increasing age, prevalence of hypermetropia was higher and myopia is the most common disorder in the age group (31-60 years). This study also indicated that the crude prevalence of myopia is the highest of any disorder in this age group affecting about 1 in 4 persons in the United States and Western Europe and about 1 in 6 of Australians.¹¹

In our study we found Myopia to be the most prevalent refractive error in age group ranging from (5-45) years which were 372 patients in number while in ages (46-60) years hypermetropia was seen with a total of 223 patients. A study on Chinese population showed that refractive error varies with age. For Myopia a typical U shaped bimodal pattern was seen. This study also showed that the age pattern as compared to myopia was reversed for hypermetropia with the highest prevalence at the age of 60-69 years.¹²

A study on Refractive errors on Nigerian adults showed the crude prevalence of myopia to be 16.2% which increased steadily with increasing age while hypermetropia with a prevalence of 50.7% was found to have an inverse j-shaped distribution with age.¹³

Refractive errors and sex: In our study Myopia was the most common refractive error seen in males which amounted to 86 in number (26.6%) however in females hypermetropia was the most common refractive error seen in 83 females (22.6%). Also the occurrence of simple myopic astigmatism, hypermetropic astigmatism (both simple and compound) and mixed astigmatism were found in females more than males and this could be due to increased total number of female patients visiting the OPD department. This is in accordance with a study done Nigerian adults which showed the prevalence of hypermetropia was significantly higher for women versus men (55.6% versus 44.7%). Hypermetropia was seen to rise to maximal levels in the 50-59 age group followed by a decline in later years. The higher prevalence of hypermetropia for women was also observed in other studies conducted in Bangladesh, South Indian population, Australia and United States.^{14, 15,16,17,18} In rural India similar results were obtained with hypermetropia being more common in women than in men. Hypermetropia was shown to increase until the age of 60 years followed by a decline.¹⁹ A study on Chinese Adults also showed a significantly higher prevalence of hypermetropia and astigmatism while there was no significant difference between the two genders in age adjusted values for myopia.²⁰

The limitations in our study included a relatively small sample size. Also there was inadequate documentation regarding associated features such as Diabetes, hypertension, heart disease and Myopic family history. The strength of our study was that although the prevalence of refractive errors has been analyzed in other parts of Pakistan there has been no study which has shown the correlation of simple and compound myopia and hypermetropia to age and sex of individuals.

Our Study showed Simple Myopic Astigmatism to be prevalent more in females than males while compound myopic astigmatism was found to be present in greater frequency in males 44(13.6%) versus females 41(11.1%). However hypermetropic astigmatism both simple and compound were seen in to occur more in females(76) as compared to males(50). When comparing the prevalence of simple and compound myopic astigmatism in different age groups we found simple myopic astigmatism to occur in greater frequency in individuals aged 5-45 years. In patients of age group 46-60 years and 61-75 years compound hypermetropic astigmatism was found to dominate over other types of astigmatism.

CONCLUSION

In our study we found myopia to be the most common refractive error (n=153 22.1%) followed by myopic astigmatism (n=148 21.4%). Myopia and myopic astigmatism were seen in males more than females

while hypermetropia, hypermetropic astigmatism (both simple and compound) and mixed astigmatism were seen in more in females as compared to males. Myopia was seen as the most common refractive error in individuals aged 5-30 years and myopic astigmatism was present most commonly in individuals aged 31-45 years. Hypermetropia was found in greatest frequency in patient's aged 46-60 years and 61-75 years age group.

In summary we found variation in the prevalence of refractive errors not only amongst genders but also a strong correlation of refractive error to age was also observed.

REFERENCES

1. Tarcy-Hornoch K, Ying-Lai M, Varma R, and Los Angeles Latino Eye Study Group. Myopic refractive error in adult Latinos: Los Angeles Latino Eye Study. *Invest Ophthalmol Vis Sci.* 2006; 47:1845-52.
2. Oduntan AO. Prevalence and causes of low vision and blindness worldwide. *S Afr Optom* 2005; 64: 44-5.
3. Durrani J. Blindness statistics for Pakistan. *Pak J Ophthalmol* 1999; 15: 1-2.
4. Kempen JH, Mitchell P, Lee KE, Tielsch JM, Broman AT, Taylor HR, et al. The Prevalence of Refractive Errors Among Adults in the United States, Western Europe, and Australia. *Arch Ophthalmol* 2004;122(4):495-505
5. World Health Organization: Programme for the Prevention of Blindness and Deafness. Global Initiative for the Elimination of Avoidable Blindness. 1997;1-7. Dandona R, Dandona L. Refractive error blindness. *Bull World Health Organ* 2001;79(3):237-243.
6. Durani J. Blindness statistics for Pakistan. *Pak J Ophthalmol* 1999; 15:1-2.
7. World Health Organization. Elimination of Avoidable Visual Disability Due to Refractive Errors. 2000; WHO Geneva. Publication No. PBL/00.79
8. Ayoob M, Dawood Z, Ali S. Refractive errors and their relation to age and sex. *Medical Channel* 2011; 17(2):28-31.
9. Shah S, Jadoon M, Dineen M. Refractive errors in the Adult Pakistani population: The National Blindness and Visual Impairment Survey. *Ophthalmol Epidemiol* 15;183-190.
10. Ling Y, Wong T, Ping L. Refractive errors in a rural Chinese population. *Am Acad of Ophthalmol* 2009;116:2119-2127.
11. Vitale S, Ellwein L, Cotch MF, Ferris FL, Sperduto R. Prevalence of Refractive Error in the United States 1999-2004. *Arch Ophthalmol.* 2008; 126(8):1111-1119.

12. Liang YB, Friedman DS, Wong TY, et al. Rationale, design, methodology, and baseline data of a population based study in rural China: the Handan Eye Study. *Ophthalmic Epidemiol* 2009;16:115-27.
13. Kyari F, Gudlavalleti MVS, Sivasubramaniam S, Gilbert CE, Abdull MM, Entekume G, et al. Prevalence of Blindness and Visual Impairment in Nigeria: The National Blindness and Visual Impairment Survey. *Invest. Ophthalmol Vis Sci* 2009;50:2033-39.
14. Bourne RR, Dineen BP, Ali SM, Noorul Huq DM, Johnson GJ. Prevalence of refractive error in Bangladeshi adults: results of the National Blindness and Low Vision Survey of Bangladesh. *Ophthalmol* 2004;111:1150-60.
15. Krishnaiah S, Srinivas M, Khanna RC, Rao GN. Prevalence and risk factors for refractive errors in the South Indian adult population: The Andhra Pradesh Eye disease study. *Clin Ophthalmol* 2009;3:17-27.
16. Wensor M, McCarty CA, Taylor HR. Prevalence and risk factors of myopia in Victoria, Australia. *Arch Ophthalmol* 1999;117:658-663.
17. Wu SY, Nemesure B, Leske MC. Refractive errors in a black adult population: the Barbados Eye Study. *Invest Ophthalmol Vis Sci* 1999;40:2179-84.
18. Vitale S, Ellwein L, Cotch MF, Ferris FL, 3rd, Sperduto R. Prevalence of refractive error in the United States, 1999-2004. *Arch Ophthalmol* 2008;126:1111-9.
19. Raju P, Ramesh SV, Arvind H, George R, Baskaran M, Paul PG, et al. Prevalence of refractive errors in a rural South Indian population. *Investigative Ophthalmology and Visual Sci* 2004;45:4268-4272.
20. Liang YB, Friedman DS, Wong TY, et al. Rationale, design, methodology and baseline data of a population-based study in rural China: the Handan Eye study. *Ophthalmic Epidemiol* 2009;16:115-2.

Craniofacial Measurements for the determination of Occlusal Vertical Dimension and Gender Dimorphism in a Section of Pakistani Population

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ABSTRACT

Objectives: The objective of this study was to check the authenticity of various facial measurement theories, their implementation among Pakistani population and comparison of these measurements in male and female.

Study Design: Prospective Comparative

Place and Duration of Study: The study was conducted in Department of Prosthodontics, College of Medicine & Dentistry, The University of Lahore, Pakistan from March 2014 to September 2014.

Methodology: Thirteen different measurements were taken on fully dentate subjects. All measurements were taken on fully dentate subjects in centric occlusion. The craniofacial distances were measured using Boley's gauge of "Tricle" brand while the distance from chelion to chelion along the curvature of the lips was measured using a flexible scale. Results were statistically analyzed by using SPSS version 20.

Results: Ten measurements showed significant gender dimorphism ($p < 0.05$). However, there were three measurements, hair line to right eyebrow line, center of pupil of right eye to center of pupil of left eye and outer canthus of right eye to inner canthus of right eye multiplied by two, which revealed close approximation in male and female ($p \geq 0.05$).

Conclusion: There is no significant gender difference in these three measurements for the determination of OVD among Pakistani subjects.

Key Words: Craniofacial Measurements, Occlusal Vertical Dimension, Gender Dimorphism

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INTRODUCTION

Satisfactory rehabilitation of the edentulous patients is a challenge for the prosthodontists ever since, the first complete denture was constructed. Along with other difficulties, accurate reproducible maxillo-mandibular relationship has been a problem that amplifies in case of long edentulous spans as it significantly affects the appearance, speech and mastication.^{1,2} A number of methods have developed over time to determine characteristics of rest and occlusal vertical relations. These can be broadly divided into physiological and mechanical methods that include the use of physiologic rest position, swallowing, phonetics, aesthetic, facial measurements, pre-extraction records, cephalometry etc.³ However, there is no universally accepted gold standard for determining vertical relation especially

when no pre-extraction records exist.⁴ There seems to be no advantage of one technique over the other, however, cost, time and equipment may be the determining factors for the clinicians in preferring one method over the other.^{5,6,7} Leonardo da Vinci,¹¹ McGee,¹² Wills,¹⁴ Knebelman¹⁰ and Carl E. Misch¹¹ were able to correlate distances of craniofacial landmarks to establish occlusal vertical dimension in skulls where growth, development and occlusion were normal. With so many craniofacial measurements available, the clinician may take the average of 5 or more (especially when they are within a 1 to 2 mm range). Once the initial OVD is determined, the occlusion rims or acrylic templates may be used to confirm phonetics, deglutition and physiologic rest jaw position.⁸ In view of the fact that radiographs and other costly delicate measuring devices are not needed in the case of the facial and finger measurements, this can be an attractive choice.⁹

Review of literature reveals that Caucasian and Asian characteristics used in numerous craniofacial measurements indicate certain gender dimorphism even individuals belonging to the same race and different

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geographical regions may have differences. Socio-cultural and racial variables have definite influences.¹⁰ Little work has been reported in the literature regarding the craniofacial methods in determining occlusal vertical dimension among males and females in Pakistan. This study was aimed to assess the gender dimorphism among the above mentioned characteristics in a section of Pakistani population. The lower facial height (chin-nose distance) in dentate patient when teeth are in centric occlusion is comparable to occlusal vertical dimension when the upper and lower denture bases along with occlusal rims are in contact. Thus the current study was carried out on dentate patients as large sample size is required for longitudinal study on edentulous patients and the present study may be useful in determining lost occlusal vertical dimension of edentulous patients.

MATERIALS AND METHODS

This study was conducted in Department of Prosthodontics de'Montmorency College of Dentistry, Lahore on 300 healthy subjects within age range of 18-25 years' having an orthognathic dentition. The total sample was distributed into 4 groups based on age and gender. Group 1 and 3 were male subjects, while Group 2 and 4 belonged to female subjects. Subjects in age group of 18-21 were placed in Group 1 and 2, while those in age group 22-25 were allotted Group 3 and 4 (Table 1).

Inclusion Criteria: Subjects having Angle's class -1 maxillo-mandibular relationship and with a definite occlusal stop in centric occlusion were included in this study.

Exclusion Criteria: Subjects with posterior bite collapse as a result of loss of teeth and those having excessive amount of soft tissues under the chin were excluded.

The written consent of all the participants for inclusion in the study was obtained.

All measurements were taken on fully dentate subjects in centric occlusion. The craniofacial distances were measured using Boley's guage of "Tricle" brand while the distance from chelion to chelion along the curvature of the lips was measured using a flexible scale.

Following parameters were used to record the required measurements (Table 2).

RESULTS

The database of all study sample measurements was analyzed in SPSS version 20 and Paired-Sample t-Test was used.

Table: 3 indicates the results of the present study. Mean values of the parameters "a, c, d, e, f, g, h, j, l, and m" were found to have statistically significant p-value, thus indicated a difference in their measurements among male and female. Mean values of parameters

"b", "i" and "k" indicated a non-significant difference of these parameters in males and females.

Table No. 1: Gender Distribution

Gender	Number of Patients	%age	Mean Age (Years)
Male			
Group 1	75	25%	19.52
Group 2	75	25%	22.54
Female			
Group 3	75	25%	19.73
Group 4	75	25%	21.75

Table No. 2: Craniofacial Distances

Abbreviations	Parameters to be measured
a)	Superior surface of right ear to inferior surface of the right ear
b)	Hair line to right eyebrow line
c)	Mesial wall of right external auditory canal to lateral corner of the bony orbit
d)	Bridge of the nose to base of the right ala of the nose
e)	Right eyebrow line to base of the right ala of nose
f)	Right corner of lips to left corner of lips
g)	Outer canthus of right eye to right angle of mouth
h)	Center of pupil of right eye to lower Border of upper lip
i)	Center of pupil of right eye to center of pupil of left eye
j)	Outer canthus of right eye to inner canthus of left eye
k)	Outer canthus of right eye to inner canthus of right eye (x2)
l)	Inner canthus of right eye to inner canthus of left eye (x2)
m)	Lower border of the septum of the nose to most under surface of the mandible

Table No. 2: Comparison of Craniofacial among male and female

Parameter	Male	Female	p value
a) Superior surface of right ear to inferior surface of the right ear	61.58	57.57	0.000
b) Hair line to right eyebrow line	58.02	58.69	0.461
c) Mesial wall of right external auditory canal to lateral corner of the bony orbit	72.24	66.70	0.000
d) Bridge of the nose to base of the right ala of the nose	59.66	57.37	0.000
e) Right eyebrow line to base of the right ala of nose	67.68	65.63	0.001
f) Right corner of lips to left corner of lips	66.31	61.11	0.000
g) Outer canthus of right eye to right angle of mouth	68.70	65.99	0.000
h) Center of pupil of right eye to lower Border of upper lip	66.77	64.63	0.007
i) Center of pupil of right eye to center of pupil of left eye	61.83	60.98	0.089
j) Outer canthus of right eye to inner canthus of left eye	64.33	62.82	0.005
k) Outer canthus of right eye to inner canthus of right eye (x2)	64.25	63.56	0.187
l) Inner canthus of right eye to inner canthus of left eye (x2)	63.38	61.20	0.000
m) Lower border of the septum of the nose to most under surface of the mandible	65.80	59.61	0.000

DISCUSSION

Leonardo da Vinci¹¹ in his book "Anatomical Studies" contributed several observations and drawings on the facial proportions. He found chin nose distance equal to the parameters "a", "b" and "j" of this study. He also described the gender differences in these measurements. In Pakistani population, parameter "b" had non-significant p-value (0.461) showing positive relationship in measurements among the males and females.

McGee¹² determined the known vertical dimension of occlusion with five parameters "d, f, g, h and i" of present study. Ruchi Ladda and co-workers also advocated parameter "i" for the determination of occlusal vertical dimensions.¹³ In the present study, mean values of parameters "d, f, g and h" did not constitute close approximation in male and female among Pakistani population. The parameter "i" of this study which was described by McGee; for the determination of OVD showed a non-significant p-value (0.089) for gender difference in their measurements. According to Willis theory¹⁴, the parameter "g" should be equal to the chin nose distance similar to what McGee described, and again as described above it did not coincide among male and female in Pakistani population.

Knebelman's study described parameter "c" for the determination of OVD.¹⁰ Al-Dhaheer and co-workers also advocated the relationship of parameter "c" and chin nose distance.¹⁵ The present study could not confirm the positive relationship among male and female subjects.

Misch¹¹ stated that the occlusal vertical dimension is related to twelve different facial measurements. He adopted nine parameters previously described by Leonardo, McGee, Willis, Knebelman and Ruchi Ladda.¹⁰⁻¹⁴ In addition to these, he mentioned three parameters "e, k and l" by himself. In this study the result of parameters "e" and "l" did not correlate, while the mean value parameter "k" coincides with each other in males and females.

CONCLUSION

Accurate reproducible maxillo-mandibular relationship of the edentulous patient can be successfully determined by measuring various craniofacial landmarks. All the described craniofacial measurements yielded adequate gender dimorphism except the following three parameters which have no significant gender difference in their measurements for the determination of OVD among Pakistani population sample.

b) Hair line to right eyebrow line

i) Center of pupil of right eye to center of pupil of left eye

k) Outer canthus of right eye to inner canthus of right eye (x2).

REFERENCES

1. Sharry JJ. Complete Denture Prosthodontics. 3rd Ed. New York: McGraw Hill;1974.
2. Millet C, Leterme A, Jeannin C, Jaudoin P. Vertical dimension in the treatment of the edentulous patient. *Rev Stomatol Chir Maxillofac* 2010;111: 315-30.
3. Qamar K, Munir U, Naeem S. Role of Cephalometry in Evaluation of Vertical Dimensions. *Pakistan Oral & Dental J* 2013;33: 183-6.
4. Turrell JW. Clinical assessment of vertical dimensions. *The J of Prosthetic Dentistry* 2006;96: 79-83.
5. Den Haan R, Witter DJ. Occlusal vertical dimensions in removable complete dentures. *Ned Tijdschr Tandheelkd* 2011;118: 640-5.
6. Ahmed AI. Factors which determine the acceptable occlusal vertical dimensions in complete dentures. *Jopdak* 1988;4: 97-9.
7. Discacciati JA, Lemos de Souza E, Vasconcellos WA, Costa SC, Barros VM. Increased vertical dimension of occlusion: signs, symptoms, diagnosis, treatment and options. *J Contemp Dent Pract* 2013;14:123-8.
8. Misch CE. Vertical occlusal dimensions by facial measurements. *Continuum Misch Implant Institute Newsletter* 1997: Summer.
9. Misch CE. Maxillary denture opposing an implant prosthesis. In: Misch CE, editor. *Contemporary Implant Dentistry*. St. Louis: Mosby;1999.
10. Knebleman S. The Craniometric method for establishing occlusal vertical dimensions. US Patent No. 4718850. Wynnewood PA: Craniometrics Inc;1987.
11. Misch, CE. Objective vs. subjective methods for determining vertical dimensions of occlusion. *Q International* 2000;31: 280-2.
12. McGee GF. Use of facial measurements in determining vertical dimensions. *J Am Dent Assoc* 1947;35: 342-50.
13. Ladda R, Kasat VO, Bhandari AJ. A new technique to determine vertical dimension of occlusion from anthropometric measurement of inter-pupillary distance. *J Clin Exp Dent* 2014;6: 395-9.
14. Swenson MG. Complete denture. St. Louis: CV Mosby;1959.p.123-5.
15. Al-Dhaheer HA, AL-Huwaizi AF. Determination of the vertical dimension by cranio-facial measurement using clinical and cephalometric analysis (comparative study). *J Bagh College Dentistry* 2009;21: 44-7.

Outcome of Dimon-Hughston Osteotomy in Unstable Intertrochanteric Fractures

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ABSTRACT

Objective: To Evaluate effectiveness of Dimon-Hughston osteotomy using a dynamic hip screw in unstable intertrochanteric fractures in term of union.

Study Design: Descriptive case series

Study Place and Duration: This was a multicenter study conducted at Lahore General Hospital, Surriya Azeem Hospital Lahore and Civil Hospital Quetta for the period of 36 months (Between January 2012-December 2014).

Methods and Materials: Through non-probability purposive sampling, 50 cases of unstable intertrochanteric fractures were included. All fifty patients were managed by Dimon Hughston osteotomy with a 135° dynamic hip screw. During the course of follow up radiographically data for union, nonunion and implant position and clinically data regarding infection was recorded. Data was analyzed by SPSS version 20.

Results: The mean age of all patients was 59.76 years (range 38-80years). There were 28(56%) male and 22(44%) female patients. All patients included in study were AO type A2 fractures. Union occurred in 34 patients 68%, mean union time was 19.88 weeks (Range 18-26 weeks) nonunion and pulling out of plate occurred in 16 patients 32% during course of follow-up. Only 2(4%) patients developed superficial infection later on which settled down with antibiotics.

Conclusion: Dimon-Hughston osteotomy for unstable pertrochanteric fractures may provided immediate stability for early weight-bearing in some patients, but has got high failure rate.

Key Words: Dimon Hughston osteotomy, unstable Intertrochanteric fractures, nonunion, hip screw, osteotomy.

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INTRODUCTION

The intertrochanteric fracture is life threatening injury among elderly patients having fragile bones. These fractures are often highly unstable.¹ Unstable intertrochanteric hip fractures account for approximately one quarter of all hip fractures in the elderly and are increasing in frequency. The goal of treatment of such fractures is stable internal fixation, which helps in immediate mobilization thus limiting complications.² The factors which determine stability of fixation include; bone quality, fragment geometry, reduction, implant design, and implant placement. Of these five elements of stable fixation, the surgeon can control only the quality of the reduction and the choice of implant and its placement.³

The standard procedure for internal fixation of intertrochanteric fracture is with Dynamic Hip screw now a day, but it is not always successful in all types of intertrochanteric fractures. Reoperation rates of 4% to 12% have been reported following fixation with Dynamic hip screw⁴ There is high failure rate in patients with three parts and four parts fractures. To prevent

failure in three-part and four-part intertrochanteric fractures, it is emphasized that restore medial continuity for successful internal fixation, Dimon and Hughston described techniques of osteotomy in the trochanteric area with valgus nailing and medial displacement to improve stability for such type of unstable fractures.⁵ Rationale of this study was to find out effectiveness of Dimon Hughston osteotomy in patient three and four part fracture.

MATERIALS AND METHODS

This descriptive case series study was conducted at Lahore General Hospital, Surriya Azeem Hospital Lahore and Civil Hospital Quetta for the period of 36 months (Between January 2012-December 2014). Through non-probability purposive sampling, 50 cases of unstable intertrochanteric fractures (AO TypeA2) were included. Inclusion criteria was same in all the centers. Demographic information of patients was obtained, Patients were explained about the risks and informed and written consent was taken. All fifty patients were managed by Dimon Hughston osteotomy with a 135° dynamic hip screw.

The surgical technique included following steps:

1. All cases were done in Spinal anesthesia.
2. The operation was performed on a traction table under image intensifier, using the lateral approach.

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3. If it was not fractured, the lateral wall of the greater trochanter (the origin of the vastus lateralis) underwent osteotomy and was elevated anteriorly; hence, the end-on view of the proximal fracture fragment could be used.

4. Guide-pin was inserted into head and neck under image intensifier. pin was aimed at the centre of the femoral head in the Anteroposterior and lateral views; the hip screw was inserted after measuring, reaming, and tapping.

5. The medial metaphysical spike of the proximal fragment was trimmed to jam it into the medullary cavity of the femoral shaft.

6. The level of the traverse osteotomy was located at the shaft where three-quarters of the cortical circumference was intact; the soft tissue attachment of the osteotomised trochanteric fragment was preserved and acted as a bone graft.

7. The lateral femoral cortical defect was shaped by a rongeur to accommodate the barrel of the DHS plate (short or standard barrel, depending on the length of the hip screw used).

8. The medial metaphyseal spike was fitted into the medullary cavity of the shaft, and the DHS plate was then fixed to the femur with cortical screws.

10. Greater trochanter was reached with the help of lag screw

11. The wound was irrigated with 3 liters of saline before closure.

12. A suction drain was inserted routinely and the wound was closed.

All Patients were followed regularly i.e. on 1st, 15th, 30th post operative day then monthly. Radiographs were taken monthly until union was achieved. During the course of follow up radiographically data for union, nonunion and implant position and clinically data regarding infection was recorded. This data was collected in a specially designed Performa. Data was analyzed by SPSS version 20.

RESULTS

The mean age of all patients was 59.76 years (range 38-80 years). There were 28(56%) male and 22(44%) female patients.

Table No.1: Distribution

Male	Female	Total patients
28	22	50

Table No:2: Showing Mode of Injury

Mode of Injury	Slipped at home	RTA	Fall from stairs	Total patients
	32	14	4	50

Table No. 3: AO Type A2 Fractures Distribution According to Subtypes

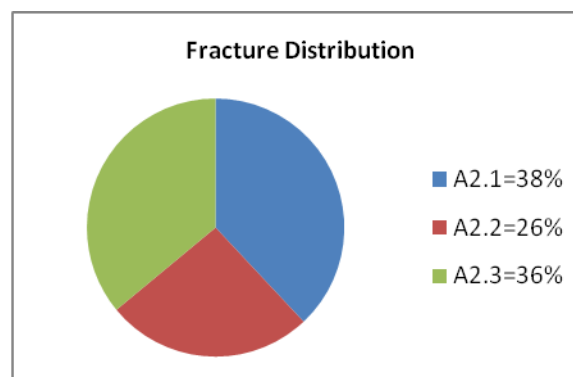
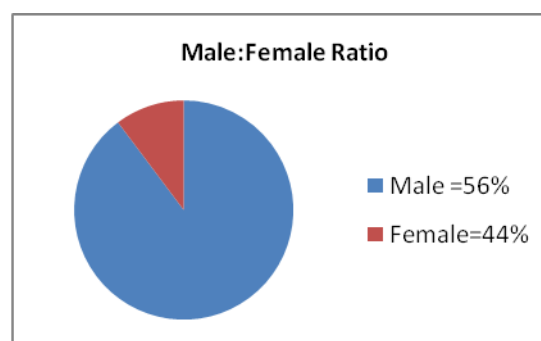
A2.1	A2.2	A2.3	Total patients
19	13	18	50

Table No:4: Showing Distribution of union and Nonunion

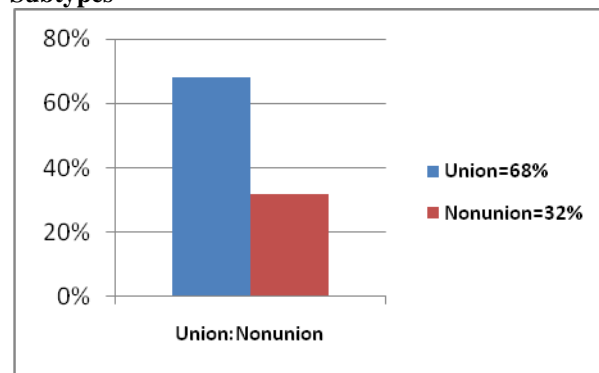
Union	Nonunion	Total patients
34	16	50

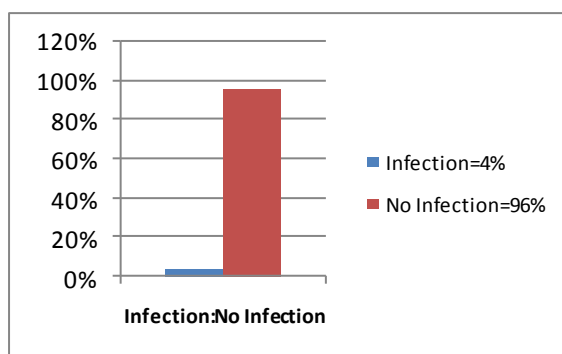
Table No: 5 showing infection rate

Infection	No infection	Total patients
2	48	50



AO Type A2 Fractures Distribution According to Subtypes





Case No:1



Preoperative Radiograph



Postoperative Radiograph (Dimon Hughston Osteotomy and Fixation with 135° DHS)

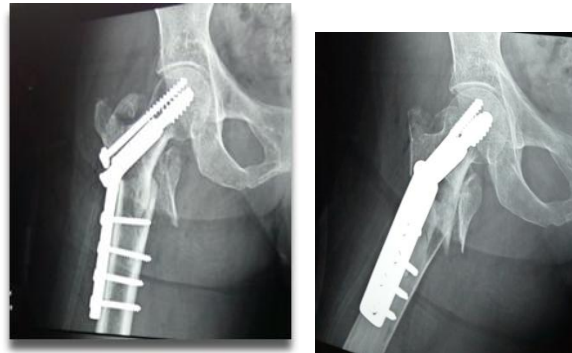


Radiograph Showing nonunion and Implant Failure

Most common mode of injury was slip at home 32 (64%) and in others Road traffic Accident 14(28%) fall from stairs 4(8%).All patients included in study were AO type A2 fractures(A2.1, 19 (38%) A2.3 18 (36%) A2.2 13(26%).Right hip was involved in 27 (54%)

patients and left in 23 (46%) patients. Union occurred in 34 patients 68%, mean union time was 19.88 weeks (Range 18-26 weeks) nonunion and pulling out of plate occurred in 16 patients 32% during course of follow-up. Only 2(4%) patients developed superficial infection later on which settled down with antibiotics.

Case No:2



Showing and Lateral Radiograph (Dimon Hughston Osteotomy and Fixation with 135° DHS)



Anteroposterior View, Radiograph showing Union

DISCUSSION

Intertrochanteric fractures comprise approximately 50% of all hip fractures .The incidence is more in female population compared to males due to osteoporosis.⁶ Intertrochanteric fracture is life threatening injury among elderly patients having fragile bones. These fractures are often highly unstable¹. Internal fixation and early mobilization of patients with trochanteric fractures of the femur is generally accepted, not only to reduce the morbidity/mortality rates associated with the prolonged immobilization, but also to improve the functional result in terms of malunion and mobility.⁷

In stable intertrochanteric fractures, osteosynthesis using dynamic hip screws (DHS) provides good results, but for unstable intertrochanteric fractures, the best treatment method is still a matter of controversy.⁸ Implant failure is a major problem in the treatment of intertrochanteric fractures. The major problem has been cutting out from head superiorly (with in or through the femoral head superiorly or neck confinement), bending breakage of plate, pulling off plate from shaft, disengagement of screw within femoral head.⁹

The strength of fracture fragments implant assembly is determined by 5 variables i.e. bone quality, fracture geometry, fracture reduction, implant design and implant placement. Out of these five, bone quality and fracture geometry are beyond the surgeon's control.¹⁰

Dimon and Hughston described techniques of osteotomy in the trochanteric area with valgus nailing and medial displacement to improve stability for such type of unstable fractures.⁵

In this study, 50 patients were treated with Dimon-Hughston osteotomy and additional valgus alignment using a 135° DHS plate for unstable pertrochanteric fracture (AO type A2) of the femur. This techniques of osteotomy in the trochanteric area with valgus nailing and medial displacement was done to improve stability for such type of unstable fractures.

The mean age of all patients was in our study was 61.76 years (range 38-80years). In one study by, Laghari MA, the mean age of patients presented with intertrochanteric fracture was 63.9 years (range 25-71)¹¹

In our study there were 28(56%) male and 22(44%) female patients and the male-to-female ration was 1:1.2. In study by Butt-et-al¹² ratio was 0.44:1 and IN Study by Saeed Akhtar et-al¹³ the male female ratio was 2.2:1.

In our study all patients were AO type A2 fracture A2.1, 19 (38%) A2.3 18 (36%) A2.2 12(26%)

In our study union rate was 68% (34 patients), mean union time was 19.88 weeks (Range 18-26 weeks) mean union time in study by Yiu HW was 10.6 weeks.¹⁴ In our study nonunion and pulling out of plate and breakage of screw occurred in 16 patients(32%).In study by Butt et-al failure rate was 12.5 %.¹²

In our study Only 2(4%) patients developed superficial infection later on this settled down with antibiotics. Infection rate in studies conducted by Desjardins infection rate was 3.5 %¹⁵, and Butt et-al was 4.5%.¹².

CONCLUSION

Dimon-Hughston osteotomy for unstable pertrochanteric fractures may provided immediate stability for early weight-bearing in some patients, but has got high failure rate.

REFERENCES

1. Davis TRC, Sher JL, Horsman A, Simpson M, Porter BB, Checklets RG. Intertrochanteric femoralfractures: Mechanical failure after internal fixation. JBJS 1990;72B:26-31.
2. Lindskog DM, Baumgaertner MR. Unstable intertrochanteric hip fractures in the elderly. J Am Acad Orthop Surg 2004;12(3):17990.
3. Canale ST. Campbell's Operative Orthopaedics 11th ed. Philadelphia: Elsevier; 2008.p.32373.
4. Buciuto R, Hammer R. RAB-plate versus sliding hip screw for unstable trochanteric hip fractures: stability of the fixation and modes of failure – radiographic analysis of 218 fractures. J Trauma 2001; 50(3): 545–50.
5. Hughston JC: Intertrochanteric fractures of the femur (hip), Orthop Clin North Am 5:585, 1974.
6. Dayanand M, Deepak S, Kumar M, Kumar v, Patil MS. Management of Intertrochanteric Fractures of Femur by Minimally Invasive Dynamic Hip Screw 2014;13(4):68-72.
7. Velasco RV, Comfort TH. Analysis of treatment problems in subtrochanteric fractures of the femur. J Trauma 1978;18:513.
8. Simpson AH, Varty K, Dodd CA. Sliding hip screws: modes of failure. Injury 1989;20:227-31.
9. Pahore MK, et, al. Evaluation of Risk of Lag Screw Cut Out in UnstableIntertrochanteric Fractures JLUMHS 2011;10(3).
10. Kaufer. Mechanics of the treatment of hip injuries. Clin Orthoped Rel Res 1980;146:53-61.
11. Laghari AM, et al. Intertrochanteric screw fixed with Dynamic Hip screw. JPOA 2006 ;18(1).
12. Butt MS. Comparison of dynamic hip screw and gamma nail Aprospective randomized trial injury. Intern J Care of Injured 1995;26:615-8.
13. Saeed KM, Akhtar NM. Evaluation of dynamic compression screw and Jewett nail in treatment of unstable trochanteric fractures of femur plate. J of Pak Orthopaedic Assoc 1996;2:1-6.
14. Yiu HW, Yu KS, Ngai WK. Modified Dimon-Hughston Osteotomy for Unstable Pertrochanteric Fractures in Geriatric Patients. Hong Kong J Orthop Surg 2005;9(1):1-7.
15. Desjardins AL, Roy A Paiement Newman N, Pedlow Desloger D et-al unstable fractures of femur. J Bone Surg 1993;75(3).

Efficacy of Intravenous Iron Sucrose Infusion in Children with Iron Deficiency Anemia: Experience at Children Hospital & ICH Multan

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ABSTRACT

Objective: To describe the efficacy of intravenous iron sucrose in children with iron deficiency anemia who did not respond to /tolerate oral iron therapy.

Study Design: Quasi experimental interventional study.

Patients and Methods: A prospective study was performed in 100 children, aged between 08 months and 15 years, 66% male and 33% female, diagnosed as iron deficiency anemia with predefined criteria excluding other causes. The children who did not respond to /tolerate oral iron therapy were treated with injectable iron in a day care hematology center. Dose of iron sucrose was calculated by a formula. Total dose was divided in three equal aliquots, each one was diluted in 0.9% normal saline and infused over a period of 120 minutes on three consecutive days. The efficacy of iron sucrose was analyzed by comparing baseline mean hemoglobin at initiation of therapy and mean hemoglobin level two weeks after iron infusion.

Results: Mean age was 4.18 ± 3.68 years. At start of treatment, baseline mean Hb was 6.09 ± 1.37 g / dl, mean MCV 51.5 ± 9.03 fl and mean ferritin 7.76 ± 7.6232 ng/ml . At day 14, mean Hb was 9.21 ± 1.134 g / dl ($P < 0.05$) , mean MCV 66.5 ± 7.19 fl and mean ferritin 52.47 ± 29.6828 ng/ml . Mean hemoglobin rise was 3.12 ± 1.081 gm/dl ($P < 0.05$). During infusion, only one patient had hypotension who was treated.

Conclusion: Iron sucrose infusion is a safe and effective way of raising hemoglobin in iron deficiency anemia in pediatric age group in special set up with minimal side effects.

Keywords: Iron deficiency anemia (IDA), Iron sucrose, Hemoglobin (Hb).

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INTRODUCTION

Iron Deficiency Anemia (IDA) is the most common cause of nutritional anemia. It usually occurs in children between 6-36 months of age. In Pakistan, data revealed that 65-78 % of the children less than five years of age are suffering from IDA, with hemoglobin levels below 11 g/dL.^{1,2} Prevalence of IDA among children less than 2 years exhibited 68% and 69 % in semi urban areas of Peshawar³ and Abbottabad,^{3,4} while it was 61-78.7 % (Hb less than 11 g/dL) in children aged 6-60 months in urban and rural slums of Karachi.^{1,5}

Major risk factors for iron deficiency anemia in children include exclusive breast feeding, cow's milk, poor weaning, malabsorption, gastrointestinal blood losses, hook worm infestation and low socioeconomic status.⁶

Treatment consists of nutritional rehabilitation with oral iron therapy and treatment of the underlying cause.⁷ Problems encountered along with oral iron therapy are unpleasant taste, intolerance and gastrointestinal discomfort.⁸ In such patients, favored treatment is intravenous iron preparation that leads to an increase in hemoglobin level and restoration of iron stores.⁹ Available parenteral iron preparations are Iron dextran and iron sucrose. Iron sucrose has minimum side effect as compared to dextran.^{10,11}

The Children hospital and the institute of Child Health, Multan is a tertiary care center catering services to the people of Southern Punjab. Many IDA patients attend Hematology Day Care Center of the Institute. We planned to see the effect of intravenous iron sucrose therapy in IDA children who fail to respond/tolerate oral iron therapy.

MATERIALS AND METHODS

This prospective interventional study (Quasi-Experimental) was approved by ethical committee of

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the Institute. Hundred children, aged between 08 months and 15 years were selected. The study was conducted from August 2013 to March 2014 in the outpatient Day Care center of Pediatric Hematology at Children Hospital and Institute of Child Health, Multan. The patients with hemoglobin < 9 g/dl, Serum ferritin < 20 ng/ml, failure to response to oral iron therapy or intolerant to oral iron therapy were included in the study. Children with iron deficiency anemia requiring blood transfusion, Hb < 4.5 g/dl with cardiac failure, anemia of chronic diseases (chronic kidney disease, liver disease), hemoglobinopathy and known hypersensitivity to iron sucrose were excluded from the study. Non-probability purposive sampling technique was used.

Iron deficiency anemia was defined as Hb < 9 g/dl and serum ferritin < 20 ng/ml.

Failure to response to oral therapy was defined as "a child on oral iron therapy in any form (Polymaltose iron complex, Ferrous gluconate or Ferrous Sulphate) with dosage of 5mg/kg/day elemental iron and increase of hemoglobin is less than 1 gm/dl after 4 weeks of treatment due to any reason like non-compliance, intolerance or malabsorption."

Efficacy was defined as mean Hb rise was more than or up to 1 gm/dl after two weeks of iron therapy.

A written consent was taken from parents or guardian after explaining merits and demerit of treatment. Baseline venous blood sample were taken for hemoglobin and Ferritin estimation. Tests were repeated two weeks after iron sucrose therapy. Outcome variable (rise in hemoglobin at the end of 2 weeks after injection) was noted for final analysis. Iron sucrose infusion is available as amber color solution, 5 ml containing 100 mg of iron. (Bisleri-Sami Pharmaceutical).

Dose was calculated by formula:

$$\text{Normal Hemoglobin for age} - \text{Initial Hemoglobin} \times \frac{\text{Blood volume} \times 3.4 \times 1.5^{12}}{100}$$

3.4 – is a constant that converts grams Hb into mg of iron
1.5 – is a constant that gives extra iron to replace the store

Blood volume - 80ml/kg

Total dose was equally divided in three equal aliquots and administered on three consecutive days. Single dose was diluted in 100cc 0.9% normal saline solution. Intravenous infusion was given slowly over a period of 120 minutes. Cardiopulmonary monitoring was done during infusion period. These patients were followed for evaluation at 2 weeks after therapy by laboratory test and clinical assessment. Data was collected on a pre-designed proforma.

Statistical Analysis: Data was analyzed by using SPSS (V-20). Mean \pm SD and percentages were used to

describe the data. P-value 0.05 is set as predetermined level of significant.

RESULTS

In this study, out of hundred cases, 66% were male. Mean age was 4.18 ± 3.68 years with range of 8 months to 15 years (Table 1). Mean score value of the end outcome hemoglobin was 9.21 ± 1.1340 that was higher than the baseline hemoglobin 6.09 ± 1.3730 (Table 2). Mean hemoglobin difference between the two groups were noted as 3.12 ± 1.081 g/dl and the result was statistically significant ($P < 0.05$). Mean rise in hemoglobin in both gender was shown in Table 3.

Table No.1: Age and sex distribution N=100

Age(year)	Number	Percentages
<1	9	9%
>1-3	34	34%
>3-7	36	36%
>7-15	21	21%
Sex		
Male	66	66%
Female	34	34%

Table No.2: Mean hemoglobin, MCV and Ferritin values

	Pre- Treatment (Mean & Standard deviation)	Post Treatment (Mean & Standard deviation)
Mean Hb g/dl	6.09 ± 1.3730 ($P < 0.005$)	9.21 ± 1.1340 ($P < 0.005$)
Mean MCV fl	51.50 ± 9.0334	66.56 ± 7.1997
Mean Ferritin ng/ml	7.76 ± 7.6232	52.47 ± 29.6828

Table No.3: Mean hemoglobin difference between male and female.

Gender	Mean Hb1(g/dl) Pre-treatment	Mean Hb2(g/dl) Post-treatment
Male	6.616 ± 1.344 ($P < 0.476$)	9.305 ± 0.945 ($P < 0.284$)
Female	5.953 ± 1.4379 ($P < 0.487$)	9.047 ± 1.4321 ($P < 0.348$)

DISCUSSION

Iron deficiency anemia is a common problem in pediatric age group and usually treated by oral iron preparations. Treatment is troublesome in certain circumstances where non-compliance and gastrointestinal upset are the major issues. Most of the time, blood transfusion is opted as the alternate treatment option in these situations which has lot of drawbacks like transmission of infection and undue burden over blood banks. Intravenous iron supplementation has given promising result in pediatric age group in various studies^{9,10,13,14,15}.

Hundred patients were studied using intravenous iron sucrose according to the said protocol. Mean values of hemoglobin in g/dl increased from 6.09 ± 1.3730 ($P < 0.005$) to 9.21 ± 1.1340 ($P < 0.005$), MCV 51.50 ± 9.0334 to 66.56 ± 7.1997 fl and ferritin from 7.76 ± 7.6232 ng/ml to 52.47 ± 29.6828 ng/ml. Overall, mean increased hemoglobin was 3.12 g/dl ($P < 0.05$).

Very few studies on intravenous iron sucrose infusion in children have been published. Rise in hemoglobin of 3.12 g / dl in this study is comparable to other studies in literature showing a rise of Hb 3.9 and 2.2 g/dl^{9,10} After 14 days, mean Hb was 9.21 g/ dl (SD 1.19) is also parallel to the report of Pinski V et al with a mean Hb. of 9.27 g/dl.¹² The result of our study is also similar to Cray SE et al that showed a median hemoglobin rise of 1.9–3.1¹³ g/dl. Safety and tolerability of the therapy in our study was assessed by the occurrence of adverse events that was hypotension while in Schroder O et al exhibited two main adverse effects but therapy was continued in spite of these effects.¹⁴ Theusinger OM found a mean hemoglobin rise of 1 ± 0.6 g/dl after two weeks of therapy in pre-operative cases.¹⁵

Although several factors account for high prevalence of IDA in children but a multi- pronged approach to alleviate this factor including nutritional education, food selection focusing dietary inhibitor and enhancer, hygiene, iron fortification of food, improved socioeconomic status and campaign may limit the magnitude of IDA.

Treatment of IDA should be aimed specifically at the underlying cause. Oral iron therapy should be initiated as first –line therapy. When a patient is refractory to oral treatment due to any reason, parenteral therapy may be considered. Currently, preferred choice is iron sucrose due to favorable pharmacological properties combined with low rates of adverse drug events. Economic considerations are also a factor in selecting this treatment. Intravenous treatment is more costly than oral. However, treatment may result in reducing overall burden of parents and physicians. It is also helpful tool in avoiding blood transfusion in treatable disease. Reluctance in prescribing this effective treatment could be explained by considering serious side effects. Data is showing low rate of occurrence of serious side effects induced by intravenous iron sucrose in treatment of IDA. It may be reasonable to re-evaluate intravenous iron sucrose indications and uses in special circumstances and even in primary care clinic.

Data suggests effectiveness and tolerability for iron sucrose but larger multicenter trials may be needed to prove a possible advantage of iron sucrose in short-term efficacy. An immediate subjective change like mood elevation & eating habit after iron infusion was noted. A long term follow up may be needed in order to see the cognitive function in later ages as there is evidence

that iron deficiency without anemia affects cognition in adolescent girl¹⁶.

Single quasi experimental study is the limitation of study. Multicenter study, randomized control trial and larger sample size would give better result for suggesting iron sucrose infusion in children.

CONCLUSION

Parenteral iron sucrose is a safe and effective way to treat iron deficiency in children who are refractory to oral iron due to intolerance, poor compliance, or iron malabsorption.

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REFERENCES

1. Molla A, Khurshid M, Molla AM. Prevalence of ID anemia in children of the urban slums of Karachi. *J Pak Med Assoc* 1992;42:118-21.
2. Jhaveri JH, Baig L. Anaemia in Children Part I – Can simple observation by primary care provider help in diagnosis?. *J Pak Med Assoc* 1994;44: 282-4.
3. Paracha PI, Hameed A, Simon J, Jamil A, Nawab G. Prevalence of anaemia in semi-urban areas of Peshawar, Pakistan: A challenge for health professionals and policy makers. *J Pak Med Assoc* 1997;47:49-53.
4. Idris M, Rehman AU. ID anaemia in moderate to severely anemic patients. *J Ayub Med Coll Abbottabad* 2005;17:45-7.
5. Rahbar MH, Hozhabri S, Wang J. Prevalence of anaemia among children living in five communities in and near Karachi, Pakistan. *Toxicol Environ Chem* 2007;89:337-46.
6. Mills A. Surveillance for anaemia: risk factors in patterns of milk intake. *Archives of disease in childhood* 1990;65(4):428-31.
7. Worwood M, Hoffbrand AV. Iron metabolism, iron deficiency and disorders of haem synthesis. In: Hoffbrand AV, Catovsky D, Tuddenham, Edward GD, editors. *Postgraduate Haematology*, 5th ed. Massachusetts: Blackwell Publishing; 2005. p. 26-43.
8. Norma B, Richard S. Iron deficiency Anemia. In: Kliegman RM, Stanton BF, Schor NS, Joseph WS,

- Behrman RE, editors. Nelson text book of Pediatrics. 19th ed. Philadelphia:NB Saunders; 2011.p 1655-58.
9. Iqbal MM, Malik BA. Parental Iron Therapy in Malnourished Children. Pakistan Arm Forces Med J 2006;;1-5.
 10. Shimada A. Adverse reaction to total-dose infusion of iron dextran. Clin Pharm 1982; 1(3): 248 -9.
 11. Al-Momen A-K, Al-Meshari A, Al-Nuaim L, Saddique A, Abotalib Z, Khashoggi T, et al. Intravenous iron sucrose complex in the treatment of iron deficiency anemia during pregnancy. Europ J of Obs & Gynae and Reprod Biol 1996;69(2): 121-4.
 12. Vezed P, Jacov L, Asher M, Baruch Y, Joseph K. Efficacy and safety of intravenous iron sucrose Therapy in a group of children with iron deficiency anemia. Israil Med Assoc J 2008;10:335 -38.
 13. Crary SE, Hall K, Buchanan GR. Intravenous iron sucrose for children with iron deficiency failing to respond to oral iron therapy. Pediatric blood & cancer 2011;56(4):615-9.
 14. Schröder O, Schrott M, Blumenstein I, Jähnel J, Dignass A, Stein J. A study for the evaluation of safety and tolerability of intravenous high-dose iron sucrose in patients with iron deficiency anemia due to gastrointestinal bleeding. Zeitschrift für Gastroenterologie 2004;42(08):663-7.
 15. Theusinger OM, Schanz U, Spahn DR. Efficacy of intravenous iron sucrose administration for correcting preoperative anemia in patients scheduled for major orthopedic surgery. Anesthesiol 2008;109(1):152.
 16. Algarin C, Peirano P, Garrido M, Pizarro F, Lozoff B. Iron deficiency anemia in infancy: long lasting effects on auditory and visual system functioning. Pediatr Res 2003;53:217-23.

Comparison Between the Measurements of Intraocular Pressure Readings taken by Pascal Dynamic Contour Tonometry and Goldmann Applanation Tonometry

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ABSTRACT

Objective: To compare the measurements of Intraocular Pressure readings taken by Pascal dynamic contour tonometry and Goldmannapplanation tonometry.

Study Design: Clinical Observational Study

Place and duration of Study: This study was carried out at the Outpatient Department of Ophthalmology, Dow University hospital (Ojha Campus) of Dow University of Health Sciences, Karachi from July 2010 to September 2010.

Materials and Methods: In a prospective single center study, 282 eyes from 141 subjects were examined by three experienced clinicians. The IOP measurements were obtained with PDCT and GAT and difference in intraocular pressure measured by PDCT and GAT was compared.

Results: IOP measurements by PDCT (mean \pm SD, 18.66 \pm 4.68 mmHg) were significantly ($P < 0.001$) higher than GAT measurements (mean \pm SD, 17.84 \pm 4.21 mmHg) correlating significantly with each other ($r^2 = 0.842$, P -value < 0.001)

Conclusion: PDCT allows the suitable and reliable IOP measurements. IOP measurements by PDCT are highly concordant with IOP readings from GAT. PDCT seems to be an appropriate method of tonometry for routine clinical use.

Key Words: Intraocular pressure, Pascal dynamic contour tonometry, GoldmannApplanation tonometry.

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INTRODUCTION

Elevated intraocular pressure(IOP) is an important risk factor in the development and progression of glaucoma.^{1,2} Reduction of IOP is the only modifiable risk factor and the established treatment for Glaucoma.³ Accurate and precise measurement of IOP has an important role in the diagnosis and follow up of patient with glaucoma and ocular hypertension. Goldmann Applanation tonometry(GAT) is considered the gold standard method of tonometry and is currently the most common method of measuring IOP.⁴ GAT based on modified Imbert Fick Principle, in which Goldmann and Schmidt determined that surface tension and corneal rigidity would nullify one another and could therefore be ignored when using a tonometer head of 3.06mm, in diameter and a normal Central Corneal thickness (CCT) of 520 μ m.⁵ GAT tends to

underestimate IOP in eyes with thin CCT and overestimate IOP in eyes with thick CCT.⁶⁻¹⁰ The Pascal dynamic contour is a non-applanation contact tonometer, supposed to measure IOP largely independent of structural properties of Cornea.¹¹ Pascal dynamic contour tonometry(PDCT) principle is based on contour matching, which assumes that if the eye were enclosed by a contoured, tight fitting shell, the forces generated by IOP would act on shell wall. Replacing part of the shell-wall with a pressure sensor would enable measurement of these forces and therefore the IOP. PDCT has a specially designed cylinder, contour matched pressure sensing tip with a concave contact surface of 10.5mm radius, which approximates to the shape of a normal cornea when pressure on both sides is equal.¹² The probe is placed adjacent to the central cornea and the integrated piezoresistive pressure sensor automatically begins to acquire data, measuring IOP 100 times per second. A complete measurement cycle requires about 8 seconds of contact time. During the measurement cycle, audio feedback is generated, which helps the clinician to maintain proper contact with the

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cornea.^{13,14} The device also measures the variation in pressure that occurs with the cardiac cycle.

The purpose of this study was to compare the IOP readings obtained by the PDCT and GAT in the eyes of normal patients. To the best of our knowledge, this study is first of its kind in Pakistan and has not been published so far in Pakistan.

MATERIALS AND METHODS

We reviewed IOP values of 282 of 141 patients (M: F= 183:99, in the age range 16- 80 years) measured using both instruments. The IOP measurement was first obtained by GAT followed by IOP measurement with PDCT. All patients underwent 5 tonometric measurements (2GAT readings, followed by 3 PDCT readings). After each GAT measurements, a rest period of 3 minutes was allowed to minimize the tonographic effects of GAT. The mean IOP reading for each measurement method was recorded. The right eye was always measured first. After application of topical anesthesia to the cornea, a paper stripe impregnated with fluorescein was used to stain the precorneal tear film before IOP measurement. GAT was performed using a slit lamp (Haag-Streit, Koeniz, Switzerland) with a tonometer calibrated according to the manufacturer's guideline. After the GAT readings, the IOP was measured with PDCT. The PDCT (pascal@ dynamic contour tonometer; Swiss Microtechnology AG, Port, Switzerland) is mounted on the slit lamp. A beeping sound is emitted by the device when the tip is in contact with the cornea and correctly positioned to take the IOP measurement and then the tip is lifted from the eye. The liquid crystal display (LCD) will generate the IOP and ocular pulse amplitude (OPA) value (in mmHg) and a quality Score 'Q'. The Q value is graded from 1 to 5 (Q1 is optimum; 2 and 3 are acceptable; 4 and 5 unacceptable). Q4 and Q5 were not included in our study. Three readings were taken and the mean value was obtained from each subject. The mean IOP per group was calculated for both GAT and PDCT, and the differences between these mean values were compared in each group.

Data was analyzed using SPSS software version 16. Continuous variables were compared using the t-test. Pearson Correlation coefficient was used to compare GAT and PDCT values. A P value less than 0.05 was considered statistically significant.

RESULTS

The study included 282 healthy eyes, 183(64.9%) eyes were of male whereas 99(35.1%) eyes were of female. The mean \pm SD of age was 44.58 ± 16.60 (range, 16- 80 years) [Table I]. IOP values measured by GAT ranged from 9-24 mmHg (Mean= 17.84 ± 4.21 mmHg) and PDCT ranged from 11.28-22mmHg (Mean= 18.66 ± 4.68 mmHg) with P value<0.001 [Table 2]. There was a strong correlation between GAT IOP and PDCT IOP

($r^2=0.842$, P value<0.001) using Pearson correlation analysis.

Table No.I: Characteristic of Study Population (n=282)

Age, years	
Mean	44.58
SD	16.60
Range	16 – 80
Sex	
Male	183
Female	99

Table No.2: GAT IOP and DCT IOP Measurement in Study Population

	GAT (mmHg)	DCT (mmHg)	DCT – GAT
Mean	17.84	18.66	0.82
SD	4.21	4.68	0.47
Min	9	11.28	2.28
Max	24	22	2

DISCUSSION

Extensive studies are available on comparison between the IOP taken by PDCT and GAT. However, to our knowledge there is no study in Pakistan so far to compare the IOPs by PDCT and GAT. In our study on 282 healthy subjects, IOP readings obtained with the PDCT have shown high concordance with IOP readings obtained by GAT. IOP readings obtained by PDCT were around 0.82 mmHg higher than the readings obtained by GAT (18.66 ± 4.68 mmHg Vs 17.84 ± 4.21 mmHg). These findings are in concordance with those of several previous studies comparing measurements with the two tonometers in healthy eyes. The study conducted by Shneider and Grehn¹⁵ on 100 healthy eyes reported that IOP measured by PDCT was higher than IOP measurement by GAT by an average of 2.34, and showing good correlation between PDCT IOP and GAT IOP ($r^2=0.693$). The similar study conducted by Kaufmann et al¹² on 228 healthy eyes reported that IOP measured by GAT was lower than IOP measurement by PDCT by an average of 1.7 mmHg. Lee J et al¹⁶ reported the significant correlation between IOP measurement by GAT and DCT ($r^2=0.853$, P<0.001). Pache et al¹⁷ conducted study on 100 healthy eyes reported that PDCT IOP was higher than GAT IOP by an average of 1. Francis et al¹⁸ also reported that IOP measured by GAT was lower than IOP measured by PDCT by an average of 1.7 mmHg and shown good concordance between the two tonometers. Several other studies¹⁹⁻²¹ shown that PDCT IOP was higher than GAT IOP with significant correlation between the two tonometers. The result of our study is quite similar to all above discussed studies demonstrating that there is significant correlation between IOPs measured by PDCT and GAT.

CONCLUSION

In healthy eyes, the PDCT allows suitable and reliable IOP readings and have an excellent concordance with measurements obtained by GAT. PDCT measurements are easy to perform and well tolerated by patient. PDCT seems to be an appropriate method of tonometry for routine clinical use.

REFERENCES

1. Kass MA, Heuer DK, Higginbotham EJ, et al. The Ocular Hypertension Treatment Study: a randomized trial determines that topical hypotensive medication delays or prevents the onset of primary open-angle glaucoma. *Arch Ophthalmol* 2002;120: 701-13.
2. Heijl A, Leske MC, Bengtsson B, et al. Reduction of intraocular pressure and glaucoma progression: results from the Early Manifest Glaucoma Trial. *Arch Ophthalmol* 2002;120:1268-79.
3. Realini T, Weinreb RN, Hobbs G. Correlation of intraocular pressure measured with goldmann and dynamic contour tonometry in normal and glaucomatous eyes. *J Glaucoma* 2009;18(2): 119-23.
4. Halkiadakis I, Patsea E, Chatzimichali K, et al. Comparison of dynamic contour tonometry with goldmann applanation tonometry in glaucoma practice. *Acta ophthalmol* 2009; 87: 323-8.
5. Goldmann H, Schmidt T. Applanation Tonometry. *Ophthalmologica* 1957; 134: 221-42.
6. Brandt JD. Corneal thickness in glaucoma screening, diagnosis, and management. *Curr Opin Ophthalmol* 2004;15: 85-9.
7. Garway-Heath D, Kotecha A, Lerner F, et al. Measurement of intraocular pressure. In: Weinreb R, Brandt JD, Garway-Heath D, et al, editors. *Intraocular Pressure*. The Hague; Kugler Publications; 2007.
8. Whitacre MM, Stein R. Sources of error with use of Goldmann-type tonometers. *Surv Ophthalmol* 1993;38:1-30.
9. Gordon MO, Beiser JA, Brandt JD, Heuer DK, Higginbotham EJ, Johnson CA, et al. The ocular hypertension treatment study: baseline factors that predict the onset of primary open-angle glaucoma. *Arch Ophthalmol* 2002;120:714-20.
10. Doughty MJ, Zaman ML. Human corneal thickness and its impact on intraocular pressure measures: a review and meta-analysis approach. *Surv Ophthalmol* 2000;44:367-408.
11. Kanngiesser HE, Kniestedt C, Robert YC. Dynamic contour tonometry: presentation of a new tonometry. *J Glaucoma* 2005; 14: 344-50.
12. Kaufmann C, Bachmann LM, Thiel MA. Comparison of dynamic contour tonometry with goldmann applanation tonometry. *Invest Ophthalmol Vis Sci* 2004;45: 3118-21.
13. Kaufmann C, Bachmann LM, Thiel MA. Intraocular pressure measurements using dynamic contour tonometry after laser in situ keratomileusis. *Invest Ophthalmol Vis Sci* 2003; 44:3790-4.
14. Kniestedt C, Nee M, Stamper RL. Dynamic contour tonometry. A comparative study on human cadaver eyes. *Arch Ophthalmol* 2004; 122: 1287-93.
15. Schneider E, Grehn F. Intraocular pressure measurement- comparison of dynamic contour tonometry and Goldmann applanation tonometry. *J Glaucoma* 2006;15:2-6.
16. Lee J, Lee CH, Choi J, et al. Comparison between Dynamic contour tonometry and Goldmann applanation tonometry. *Korean J Ophthalmol* 2009; 23: 27-31.
17. Pache M, Wlmsmeyer S, Lautebach S, et al. Dynamic contour tonometry versus Goldmann applanation tonometry: a comparative study. *Graefes Arch Clin Exp Ophthalmol* 2005;243: 763-7.
18. Francis BA, Hsieh A, Lai MY, et al. Effects of corneal thickness, corneal curvature, and intraocular pressure level on Goldmann applanation tonometry and dynamic contour tonometry. *Ophthalmology* 2007; 114: 20-6.
19. Doyle A, Lackner Y. Comparison of dynamic contour tonometry with Goldmann applanation tonometry over a wide range of central corneal thickness. *J Glaucoma* 2005;14:288-92.
20. Grieshaber MC, Schoetzau A, Zawinka C, et al. Effect of central corneal thickness on dynamic contour tonometry and Goldmann applanation tonometry in primary open angle glaucoma. *Arch Ophthalmol* 2007;125:740-44.
21. Salvat ML, Zeppieri M, Tosoni C, et al. Comparisons between Pascal dynamic contour tonometry, the Tonopan and Goldmann applanation tonometry in patients with glaucoma. *Acta Ophthalmol Scand* 2007;85:272-79.

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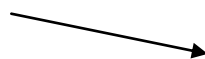
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