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Editorial

Medical Students Training In Community Settings: An Essential Requirement To Meet Growing Health Needs Of Pakistani Population

Sara Shakil

The successful provision of adequate primary health care delivery for the underprivileged population in the Asian subcontinent has remained a pressing issue over quite some time. Major reforms in health professions education have taken place across the globe including Asia. Unfortunately, the health education system implemented in Southern Asia (including Pakistan, India, Bangladesh etc.) has not been able to decrease morbidity and decrease the figures of adult and infant mortality rates in this region[1].

Pakistan is a developing country with profound governmental, financial and socioeconomic constraints in the growth of healthcare sector. About sixty five percent of Pakistani population resides in rural settings who hardly have access to high-quality health care[2]. Unwillingness of physicians to work in rural settings, limited health resources and misdistribution of general practitioners are some fundamental factors that are leading to severe urban-rural health inequalities. It is a well-known fact that Pakistan has been striving very hard to produce proficient doctors that are able to foster growing health needs of its population. Yet the disease burden is still very high in most areas of Pakistan.

According to latest statistics, there are about 110,000 general practitioners registered with Pakistan Medical and Dental Council (PMDC) in 2014. Despite such a vast quantity of physicians in the country, large part of the population dwelling in rural areas is still calling for justice and high standards of healthcare[3].

In order to meet the needs of our local population, major transformations are required in the educational learning system depending upon what is important in the local health context of Pakistan. There is dire need of understanding the worth of "Family Medicine" as an essential aspect of primary health care in Pakistan`s context[4] as majority of the medical schools across the country do not train medical students to interact effectively with the community and cater to their social, psychological and day-to-day health problems. The foundation of this specialty was laid down in late eighties where concepts of health promotion and disease prevention were introduced for the first time. Recently, Pakistan Medical and Dental Council has made it compulsory for all medical institutions to develop a family medicine department[5]. At present, the Aga Khan University Hospital and College of Physicians of Surgeons Pakistan carries out a postgraduate training program in family medicine to train physicians.

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There is no such program across the country that targets training of undergraduate medical students in this regard. Only if the undergraduate students receive continuous training in local community right from early years in schools, it may be hoped that they evolve as adept health care professionals who are well-rounded and culturally sensitive[6].

Depending on which perspective is being looked at, there are many possible definitions of community. For instance World Health Organization defines community as "A group of people, often living in a defined geographical area, who may share a common culture, values and norms, and are arranged in a social structure according to relationships which the community has developed over a period of time."

In the context of health care, Richard Hays[7] talks about community as a specific category of individuals with immense cultural diversity providing an information-rich learning context for undergraduate students.

Therefore, community includes all those localities which lack first-hand primary health care like rural community districts and underserved areas within a city where a majority of underprivileged population remains unattended in terms of standardized health care facilities.

The Pakistan Medical and Dental Council needs to revamp the undergraduate MBBS curriculum and place these two positions at the top of the list in order to meet the global standards:

- Clinical training must commence right from first year of medical school instead of third year onwards as early practical experience greatly conditions students behavior ultimately making them responsible and socially accountable.
- Medical training should also be carried out in primary care settings outside the tertiary care hospitals in order to better understand the growing health needs of the society as hospitalized environments demonstrate a very narrow spectrum of health-related problems.

Why community health and health promotion are low on the list of priorities of doctors? There are many answers to this vital question that lie in keenly looking into and drawing attention towards the health education system of Pakistan.

Holistic care, that includes disease prevention, health promotion and rehabilitation are burning issues in the field of health care delivery in Pakistan which always remain unattended. At present, there are hardly very few medical colleges in Pakistan[8] which have established family medicine and general medicine departments that would steer interest among undergraduates.

There has to be a fruitful and drastic transition from single-handed, episodic 'medical care' towards a more comprehensive approach to 'health care' that is realistic, continuous, cost-effective and involves multi-health professionals to work in teams[9]. This calls for seriously highlighting family medicine as the cornerstone of health care. Some percentage of clinical rotations must be scheduled regularly in these departments.

The health education system of majority of schools in Pakistan is based on traditional principles where emphasis lies on teacher-centered, didactic lecture-based mode of instruction. As a result, the graduating students find a complete mismatch in what they have learned in their medical school and what is expected of them in the local community. As the health indicators and patterns of disease have been changing, policy makers, health care professionals and other stakeholders must realize the importance of reforming the curriculum that demands students to acquire broad-based community oriented knowledge.

Close interaction with general practitioners and extended contact with patients are main factors that make clinical training of undergraduate students in the community a compulsion having very powerful educational impact on students learning. It is these learning experiences that enable them to develop relationships with patients and condition their behavior to meet the needs of the society[10]. This can be achieved by assigning a small group of students to general physicians, scheduling weekly or half-monthly rotations in community practice and placing them in the rural-health society where they can understand relevant issues like poverty, poor hygiene and clearly look into the common day-to day health issues of patients[11].

There is overwhelming evidence that lays emphasis on designing and implementing a '*community-based medical education (CBME)'* in all government and private medical colleges in Pakistan. Students need to be pulled out of classrooms and be placed in resource-poor settings where they can interact with the local multicultural society and can identify disease presentations more readily[12].

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Original Article

Effect of *Raphanus Sativus* (Radish) Leaf Extract on Atorvastatin Induced Hepatotoxicity in Rabbits

Obaid Anwar, Mazhar Iqbal, Sadia Chiragh, Owais bin Qadeer Gill, Muhammad Iqbal

ABSTRACT

Objectives: To investigate hepato-protective effect of ethanolic leave extract of *Raphanus sativus* against atorvastatin induced hepatotoxicity in albino rabbits.

Study design: Experimental study

Material and Method: This study conducted at department of Physiology and Pharmacology, University of Agriculture, Faisalabad. The ethanolic extract of *Raphanus sativus* was prepared for hepatoprotective effect against hepatotoxicity produced by atorvastatin.

Results: The results were compared with normal and experimental control. Serum was tested for ALT, AST, Alkaline Phosphatase and Bilirubin along with histological studies. Ethanolic extract of *Raphanus sativus* with 100mg/kg. of body weight dosage developed some changes representing hepatotoxicity but higher doses showed an increase in toxicity as observed on histologic sections. A reduction in fibrosis and cholestasis was observed which needs further evaluation.

Conclusion: Ethanolic extract of *raphanus sativus* did not show any amelioration in the increased enzymes level however a reduction in cholestasis was observed as represented by decreases in alkaline phosphatase levels also confirmed by histological studies.

Key words: ALT, AST, Alkaline phosphatase, Bilirubin, Atorvastatin, *Raphanus sativus*.

INTRODUCTION:

Globally traditional medicines are rapidly gaining economic importance. Complementary-alternative and traditional medicine are gaining more and more respect by national governments and health providers in developing countries[1]. About 85% of world population uses herbal medicines for prevention and treatment of diseases. The demand is increasing in developed and developing countries[2]. A variety of chemical compounds are present in the plant as well as in fruits[3].

The liver is very important organ for metabolic functions. The liver is involved in wide range of physiological functions, which includes the biochemical pathways to growth, fight against disease, nutrient supply, energy provision and reproduction. Due to these important activities, the liver is exposed to a number of insults and is one of the body's organs most subject to injury[4,5]. Herbal drugs play an important role in the management of different liver disorders most of which fasten the natural healing processes of the liver. Several medicinal plants and their formulations are used for liver disorders in traditional system of medicine from a prolonged period of time[6].

In developed countries hepatotoxicity caused by various toxicants such as paracetamol, certain chemotherapeutic agents, carbon tetrachloride, thioacetamide, chronic alcohol consumption and microbes is among the major health problems[7]. Statins [competitive inhibitors of 3-hydroxy-3-methylglutaryl coenzyme A (HMG-CoA) reductase] are one of the most effective, well tolerated and commonly used drug for treating hyperlipidemia[8]. But myotoxicity and hepatotoxicity are the two main common significant adverse effects of statins especially with high doses[9]. Radishes are grown and consumed throughout the world, being mostly eaten raw as a crunchy salad vegetable but they also have various medicinal actions. Traditionally its leaves, seeds and roots have been in use for several disorders such gastrointestinal, cardiac, biliary, hepatic, urological and respiratory[10,11].

The Objectives of this study are to study the atorvastatin induced hepatotoxicity in albino rabbits and to evaluate the hepatoprotective effects of ethanolic extract of *Raphanus sativus* leaves against atorvastatin induced hepatotoxicity in albino rabbits.

MATERIAL AND METHODS:

This 1 year experimental study was carried out in Department of Pharmacology and Therapeutics, Post Graduate Medical

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Institute, Lahore and Department of Physiology and Pharmacology, University of Agriculture, Faisalabad. Pakistan. Ethical approval of the study was taken from Ethical Review Committee (ERC), University of Health sciences, Lahore.

100 kg fresh leaves of *Raphanus sativus* were purchased from local vegetable market and taxonomical identification was carried out at University of Agriculture, Faisalabad, Pakistan (Herbarium voucher no. 173-14-1). Washed leaves were desiccated in shade at room temperature for 10 days, dehydrated with hot air oven at 60ºC for six hours and then grinded in an electric grinder. The powder obtained was passed through mesh sieve and then extracted with 80% ethanol and filtered with filter paper (Whatman No. 2). The extracts were concentrated in a hot air oven at 37ºC, lyophilized by freeze drying apparatus (Christ Germany model # Alpha 1- 4LSC) and subsequently stored in an air tight container in a freezer at -20ºC[12]. On daily basis 2, 4 and 8 grams of extract was dissolved in 20 ml of distilled water yielding 100, 200 and 400 mg of extract in 1ml of solution.

99% pure Atorvastatin was obtained from StandPharm PVT Ltd. Lahore Pakistan. 2g of it was dissolved in 100 ml of distilled water yielding 20 mg atorvastatin in 1 ml-distilled water for administration. All the reagents used were of analytical grades.

50 adult male rabbits of 6-8 weeks old were purchased from the local market of Faisalabad, Pakistan. The physical examination of the animals was carried out in UAF animal house by veterinary doctor before randomization. The weight of rabbits ranged from 1kg to1.5 kg. They were housed in individual labeled iron cages of appropriate size in the department of Clinical Medicine and Surgery, University of Agriculture, Faisalabad, Pakistan at room temperature. The rabbits were randomly divided into 5 groups with 10 rabbits in each group and labeled as: Group **A (**Normal control) with routine diet, **B** (Positive control) with Atorvastatin (20mg/kg b.w.), **C (**Experimental group I) with Atorvastatin (20mg/kg b.w.) + *R. sativus* leaf extract (100mg/kg b.w.), **D** (Experimental group II) with Atorvastatin 20mg/kg + *R. sativus* leaf extract 200mg/kg b.w. and **E (**Experimental group III) Atorvastatin 20mg/kg b.w. + *R. sativus* leaf extract 400mg/kg b.w. for 28 days. Seasonal fodder and grains were used to fed Rabbits along with water *ad libitum*. Prior to experimentation, the rabbits were acclimatized for one week. All the rabbits were kept fasting overnight prior to the administration of test extracts.

With a 3ml disposable syringe 2 blood samples on 0 and 28 day were collected from jugular vein. After 30 minutes blood was centrifuged at 1000 x g for 15-20 min and serum was stored -20^{0}C for biochemical analysis. Animal were sacrificed at day 28 for Liver wt. /body weight ratio and histology.

Serum bilirubin, ALT, AST and Alkaline Phosphatase were determined on chemistry analyzer Vitalab selectra E (Vital scientific, N. V., Netherland) at Allied hospital Faisalabad, Pakistan by using biochemical kits (Human, Germany) as per manufacturer instructions.

All the animals were weighed and sacrificed at end of experiment. The stomach was excised, liver tissue was dissected out and washed with normal saline. The livers were then sectioned into small pieces, fixed with formalin, dehydrated with ethanol, cleared with xylene, infiltered with melted paraffin wax, embedded in wax, sectioned, mounted on slides, stained with H&E[13]. The slides were finally observed for the pathological changes in liver tissue microscope with a 40X objective.

The data was analyzed using SPSS 20.0. Mean + SE was calculated for quantitative variables, which included S. bilirubin (total, direct and indirect), ALT, AST and alkaline phosphatase. P-value = 0.05 was considered as statistically significant.

RESULTS:

Serum bilirubin levels (Total, direct and indirect) were measured on day 0 and 28. When compared by one way ANOVA, it was observed that all groups were similar on day 0 but significantly different on day 28 as seen in table 1. Serum Alanine Aminotransferase (ALT), Aspartate Aminotrans-ferase (AST) and Alkaline phosphatase levels were measured on day 0 and 28. When compared by one way ANOVA and post hoc tukey's test, it was observed that all groups were similar on day 0 but significantly different on day 28 as shown in Table 2.

Photomicrograph was made from slides obtained from all groups were studied and. Parameter such as degeneration, steatosis, necrosis, triaditis were used for scoring the damage. Damage was graded as nil, mild and moderate and scored as 0, 1 and 2 respectively.

Photomicrograph of the liver tissue was obtained from the rabbit treated as normal control. Figure. 1 shows hepatic parenchyma is normal in appearance with central vein, cords of hepatocytes with prominent nuclei and portal tract.

Degeneration was absent in group A and C. Group B had mild to moderate degenerative changes. Group D had higher and group E had highest degenerative changes. Chi-square test revealed very highly significant difference between groups. Chi-square test revealed very highly significant difference between groups (Table 3 and, fig. 2).

Steatosis was absent in group A, B, C and D. Only two cases in group E showed changes of steatosis. Chi-square test revealed insignificant difference between groups (Table 4, fig. 3). Necrosis was absent in group A, C, D and E. Only two cases had mild necrosis in group B. Chi-square test revealed insignificant difference between groups (Table 3, fig.4). Triaditis was absent in group A. Four cases had severe triaditis in group B while rest of them showed mild form of

Groups	Total		Direct		Indirect	
	0 Day	28 Day	0 Day	28 Day	0 Day	28 Day
A (normal)	0.590+0.035	0.590+0.028	0.220+0.013	0.250+0.017	0.370+0.030	0.340+ 0.027
B (At. 20mg/kg)	0.640+0.04	0.920+0.073	0.230+0.015	0.320+0.029	0.410+0.031	0.600+ 0.047
C (At. 20mg/kg + *R. S.*100mg/kg)	0.590+0.046	0.700+ 0.047	0.220+0.013	0.250+0.017	0.370+0.037	0.450+ 0.043
D (At. 20mg/kg + *R. S.*200mg/kg)	0.600+0.030	0.830+ 0.042	0.230+0.05	0.330+0.015	0.370+0.021	0.510+ 0.031
E (At. 20mg/kg + *R. S.*400mg/kg)	0.580+0.036	0.930+ 0.040	0.220+0.013	0.340+0.016	0.370+0.030	0.590+ 0.031
ANOVA (P-Value)	0.816^{NS}	0.000 ***	0.962^{NS}	0.002**	0.884^{NS}	0.000***

At: Atorvastatin; *R.S.:Raphanus Sativus;* NS = Non- significant (P>0.05); * = Significant (P<0.05); ** = Highly significant (P<0.01); ***= Very highly significant (P<0.001)

Table 1: Effect of *R.sativus* extract on serum bilirubin levels (IU/L) of atorvastatin treated rabbits. Data indicates mean + SE values

Groups	ALT		AST		Al. phosphatase	
	0 Day	28 Day	0 Day	28 Day	0 Day	28 Day
A (normal)	73.00+5.05	66.70+06.13	81.80+1.88	77.90+03.37	76.20+3.41	78.30+3.61
B (At. 20mg/kg)	63.10+5.15	149.40+14.55	79.00+3.96	197.90+13.11	84.00+3.82	117.50+7.94
C (At. 20mg/kg + *R. S.*100mg/kg)	65.70+2.11	133.40+06.83	74.60+3.62	154.80+07.72	73.00+5.28	110.80+5.52
D (At. 20mg/kg + *R. S.*200mg/kg)	67.80+3.57	174.80+10.54	74.10+4.40	211.60+14.41	80.30+8.93	142.40+7.19
E (At. 20mg/kg + *R. S.*400mg/kg)	72.20+4.88	200.60+14.17	73.50+5.38	218.50+14.45	72.00+4.04	127.50+5.14
ANOVA (P-Value)	0.439^{NS}	0.000***	0.522^{NS}	0.000**	0.504^{NS}	0.000***

At: Atorvastatin; *R.S.:Raphanus Sativus;* NS = Non significant (P>0.05); * = Significant (P<0.05); ** = Highly significant (P<0.01); ***= Very highly significant (P<0.001)

Table 2: Effect of *R. sativus* extract on Alanine aminotransferase (ALT), Aspartate aminotransferase (AST) and Alkaline phosphatase (IU/L) of atorvastatin treated rabbits. Data indicates mean + SE (n= 10)

Histological parameter	**A** (Normal)	**B** At. 20mg / kg	**C** At. 20mg/kg + *R.S.* 100mg/kg	**D** At. 20mg/kg + *R.S.* 200mg/kg	**E** At. 20mg/kg + *R.S.*400mg/kg	Chi-square
Degeneration						
Nil	10 (100)	5 (50)	10 (100)	4 (40)	4 (40)	29.70***
Mild	0 (0)	4 (40)	0 (0)	0 (0)	2 (20)	
Moderate	0 (0)	1 (10)	0 (0)	6 (60)	4 (40)	
Steatosis						
Nil	10 (100)	10 (100)	10 (100)	10 (100)	8 (80)	8.33^{NS}
Mild	0 (0)	0 (0)	0 (0)	0 (0)	2 (20)	
Moderate	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
Necrosis						
Nil	10 (100)	8 (80)	10 (100)	10 (100)	10 (100)	8.33^{NS}
Mild	0 (0)	2 (20)	0 (0)	0 (0)	0 (0)	
Moderate	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
Triaditis						
Nil	10 (100)	0 (0)	0 (0)	0 (0)	0 (0)	8.67***
Mild		5 (50)	10 (100)	0 (0)	0 (0)	
Moderate		5 (50)	0 (0)	10 (100)	10 (100)	

Table 3: Effect of *Raphanus sativus* extract on histological changes

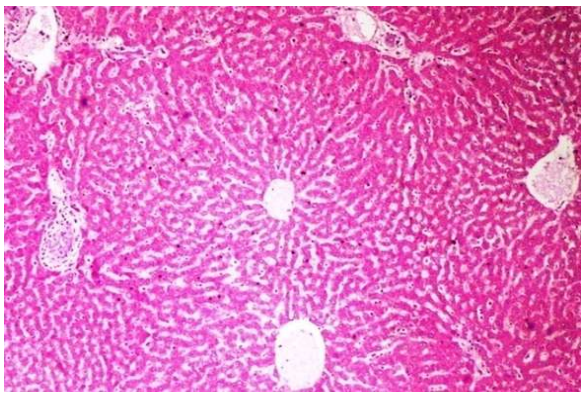

Fig. 1: Photomicrograph of liver showing normal architecture of liver lobule with central vein, cords of hepatocytes with prominent nuclei and portal tract (H&E stain x10)

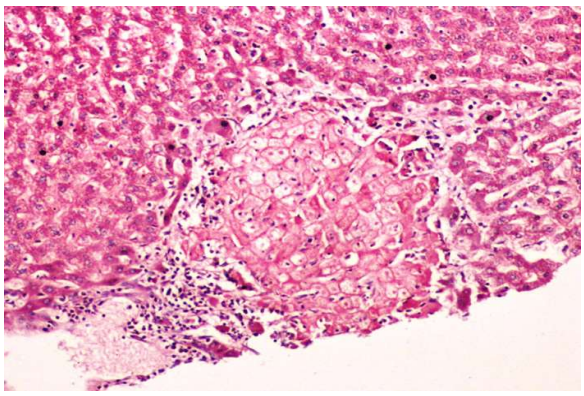

Figure 2: Photomicrograph of liver showing (ballooning) degeneration of liver (H&E stain x40)

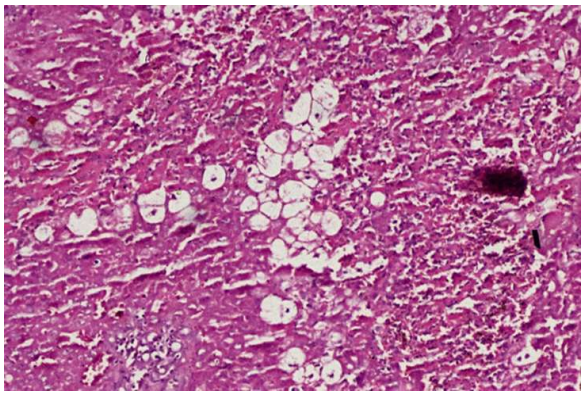

Figure 3: Photomicrograph showing steatosis (H&E stain x40)

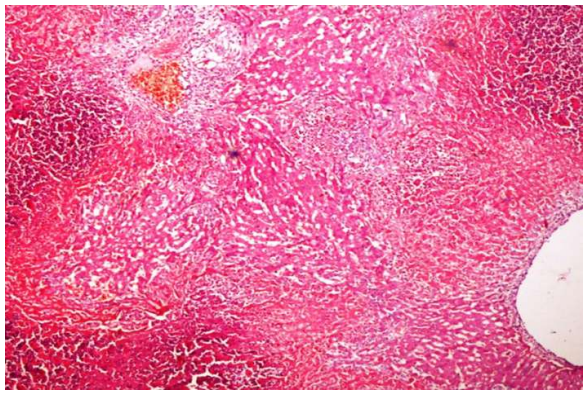

Figure 4: Photomicrograph of liver showing early signs of necrosis (H&E stain x10)

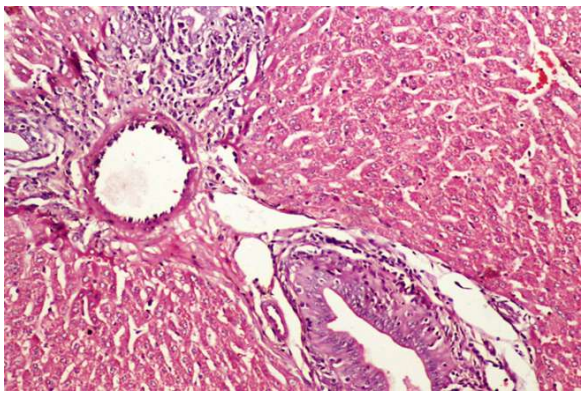

Figure 5: Photomicrograph of liver showing triaditis (H&E stain X80)

triaditis. Group C showed mild form of triaditis in all slides. Group D and E manifested severe form of triaditis in all slides. Chi-square test revealed very highly significant difference between groups (Table 3, fig. 5).

DISCUSSION:

This study investigated the effect of coadministration of toxic dose of atorvastatin and three increasing doses of *Raphanus sativus* leaf extract on serum bilirubin, liver enzymes and liver histology of local breed of rabbits.

Bilirubin level in serum can increase in hepatic disorders. Atorvastatin is known to increase the levels of bilirubin which is an final product of heme metabolism[14,15]. In the present study the level of total, direct and indirect bilirubin increased with atorvastatin but low doses (100mg/kg.b.w.) of *Raphanus sativus* leaf extract showed a partial reduction in these levels. With increasing doses of extract, further increase was seen. Doses of 300mg/kg of ethanolic extract of *Raphanus sativus* leaf failed to reverse increases in serum bilirubin against toxicity by CCl_4 in rats[16].

ALT and AST was normal in hepatocytes. Their levels increase in blood when damage occurs to liver cell membrane representing hepatic injury[17]. Earlier studies with atorvastatin have shown an increase in ALT and AST[14,15,18]. A similar effect was observed in this study i.e. increased ALT and AST (2-3 times the baseline) showing modest liver injury. In experimental groups addition of *Raphanus sativus* leaf extract indicated a partial reversal of enzyme levels in the dose of 100mg/kg b.w. By increasing doses the levels of both AST and ALT showed a further increase as compared to atorvastatin alone used in group B. Regarding the hepatoprotective activity of ethanolic extract of *Raphanus sativus* leaf in a dose of 300mg/kg against CCl_4-induced hepatotoxicity in rats showed a partial protective effect[16]. Another study showed a significant increase in AST and ALT level when *Raphanus sativus* leaf extract was given alone in a dose of 500mg/kg in rats[19]. As discussed above histamine may be responsible for these effects as histamine in a dose of 100µg/kg lead to an increase in levels of ALT and AST[20].

Alkaline phosphatase placed among group of hydrolase enzymes is present in almost all body cells including RBCs and removes phosphates from them[21] . Increase in alkaline phosphatase represents cholestasis. Cholestasis symbolizes a continuing acute or chronic process involving intrahepatic or extrahepatic biliary tree. It may include a defective synthesis, obstruction to outflow or defective bile secretion[22]. Atorvastatin in more than 10mg daily dose leads to an insignificant increase in alkaline phosphatase[14]. In present study 1.5 times increase in alkaline phosphatase level was observed after treatment with high dose atorvastatin. A partial fall in the level of alkaline phosphatase was seen when treated with 100mg/kg. b. w. of *Raphanus sativus* as compared to group B but still higher than normal control group A which is in accordance with the study by Syed[16]. Surprisingly the increase was maximal with 200mg dose of *Raphanus sativus* (even more than when given atorvastatin alone in group B) while there was less increase with dose of 400mg. This may be explained due to higher intensity of degeneration in group D as observed histologically.

Various studies which have shown a protective effect of *Raphanus sativus* leaf extract are in lower doses and shorter period of time where 300mg/kg dose was given for only seven days against CCl_4[16]. Another example is of use of crude powder of *Raphanus sativus* in 2gm and 4gm dose used only on 46^{th} and 47^{th} day[23]. This may explain the hepatoprotective effect in low doses but an increase in hepatotoxicity was seen with higher doses and long term use.

CONCLUSION:

The administration of 20mg/kg toxic doses of atorvastatin induced hepatotoxicity, manifested as increase in serum levels of ALT, AST, Alkaline Phosphatase and serum Bilirubin. Low dose of *Raphanus sativus* leaf extract showed a partial hepatoprotective effect and with high doses an increase in hepatotoxicity was seen. Thus the general concept that *Raphanus sativus* is hepatoprotective in any dose needs to be reviewed.

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Original Article

Comparison Of Clinical Efficacy Of Combined Versus Monotherapy Of Oral Zinc And Probiotic In Pediatric Acute Diarrhoea At Benazir Bhutto Shaheed Teaching Hospital, Abbottabad

Anila Farhat, Asma Shaukat, Noman Sadiq

ABSTRACT:

Objective: Evaluation of effectiveness of zinc/ probiotics alone and in combination in children with acute diarrhoea.

Place of Study: The study was conducted from May-Dec 2017 at Benazir Bhutto Shaheed Teaching Hospital Abbottabad.

Methodology: Single centered, randomized controlled clinical trial was performed in 150 children of either sex (6 months -10 years) with acute diarrhoea having stool frequency of > 5semi liquid stools per day. Patients were divided into three groups with fifty children in each group on the basis of treatment modality given. Group A received zinc orally (1-2mg/kg/day for five days along ORS and/or IV fluids if required), Group B patients were given one to two sachets of probiotics /day (saccharomyces boulardii) according to age for five days + ORS and /or IV fluid while Group C was administered combination of zinc and probiotics for five days along with ORS and /or IV fluids. Response to treatment was determined on the basis of decrease in frequency of stools i.e. <3 formed stools /day after 72 hours of commencement of treatment. We have also studied the relationship between hygiene and food intake practices with the occurrence of diarrhoea in children.

Results: Acute diarrhoea was found to be more prevalent in children with poor hygiene practices and using unboiled water. Among the treatment groups, at the end of 3rd day total of forty eight (96%) patients in group C had improved consistency of stools as well as decrease in diarrhoea frequency to less than three formed stools per day while in groups A and B thirty nine (78%) and sixteen (32%) patients respectively showed response to treatment in 72 hours.

Conclusion: Combination of zinc + probiotics therapy is more effective in children with acute diarrhoea than either alone. Among the zinc and probiotics therapy, zinc is superior in terms of clinical efficacy than probiotics alone.

Keywords: Clinical Efficacy, Zinc, Probiotic, Acute Diarrhoea

INTRODUCTION:

Diarrhoea associated morbidities are an important health issue worldwide, most common in third world countries. It is postulated that in pediatric population of less than five age group, 21% of the mortality rate is due to unmanaged diarrhoea. This amounts to 2.5 million expiries in less than five age group[1]. Different researches done in the nineteenth century assessed that 4.6 million was the mortality figure in paediatric population from gastroenteritis[2]. Throughout the world, gastroenteritis is one of the significant reasons of death in children, with almost hundreds of million incidents per year and ten to twenty hundred thousand deaths evaluated per annum in children less than five years of age[3].

Diarrhoea is said to be present when there are three or more unformed stools in a twenty four hour time or one or more loose stool containing blood. New episode of diarrhoea is labeled if the patient has at least three diarrhoea free days[4]. World Health Organisation incorporated oral rehydration solution (ORS) in the diarrhoea management guidelines thereby decreasing deaths in children by a great proportion[5]. Still acute gastroenteritis poses alarming contribution to paediatric mortality rate inspite of gains with oral rehydration therapy (ORS). Reason for this may be that ORS though improves the hydration status it has no effect on modulation of diarrhoeal episodes and their total extent, so other modalities of treatment to augment the role of ORS have been desired. Many advances have been made in this regard with the inclusion of zinc and probiotics to the paediatric diarrhoea management guidelines[6]. Reduction of diarrhoea associated diseases and subsequent death rates in children has been attributed to two treatment modalities, that is the ORS and zinc supplements[7].The Centre for Disease Control (CDC) in early ninetees gave national guideline, stressing upon the significance of the timely intervention of pediatric gastroenteritis and role of zinc in its management. Since then, many clinical studies have been done for evaluation of zinc and probiotics administration on the duration and extent of diarrhoea[4,6,8].

Zinc is a fundamental part of nutrition which prevents oxidative damage to the cell. It does not get stored in the body so its deficiency may develop in diarrhoea affected children due to losses from the damaged gut. The effectiveness of zinc therapy in diarrhoea may be due to the

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fact that it increases the overall absorptive capacity as well as more rapid repair of damaged intestine epithelium[9]. It may be used either in tablet form or suspension form, both preparations having the same zinc sulphate monohydrate formulation, but with different efficacy, which was first observed in 2005 after an earthquake in northern areas of Pakistan. After the earthquake a massive number of children developed diarrhoea due to poor hygiene in camps, and zinc was available there in both forms for diarrhoea management. There was the improvement with the treatment of zinc, but there was difference in the efficacy level between zinc tablet and suspension[10].

Lately, therapeutics of probiotics has been studied in different trials in which the beneficial use in pediatric acute diarrhoea is prominent, so European Society for Pediatric Infectious Diseases has incorporated use of probiotics in the guidelines for management of gastroenteritis in children[11-12]. Saccharomyces boulardii, a probiotic is a useful yeast that was initially found in fruits. In the prophylaxis and management of acute paediatric gastroenteritis, S. boulardii has shown clinical effectiveness as reported in different clinical studies[11].The potential therapeutic effect of probiotics may result from their ability to regulate the intestinal microbial homeostasis, disruption of bacterial invasion of intestinal mucosa, immune system modulation, reinforcement of the gut mucosal function and increasing absorptive and nutrient functioning of the intestine[12].

Studies have been done in Pakistan to investigate the importance of zinc and probiotic administration in acute diarrhoea but no study has compared the clinical efficacy of combination of zinc and probiotics with monotherapy with either in children with acute diarrhoea.Comparison of effects of zinc/ probiotics alone and in combination in paediatric acute diarrhoea (on the basis of decrease in frequency of stools)

SUBJECTS AND METHODS:

This single centered, randomized controlled clinical trial was conducted in Abbottabad at Benazir Bhutto Shaheed Teaching Hospital between May, 2017 to December, 2017. Prior approval to carry out the research was taken from the Ethical Committee of the hospital. One hundred and fifty children of either sex, aged between six months to ten years presenting with acute diarrhoea having stool frequency of more than five semi liquid stools per day reporting in OPD as well as admitted children were employed in the study. Permission was sought from the parents/guardians of the children and the children whose parents did not approve were excluded from the study. Other features of exclusion criteria included severely dehydrated children and those requiring ICU, presence of blood in stools, use of antibiotics /probiotics in last four weeks and children likely to move away from the study area during the treatment. Data comprising of duration and frequency of diarrhoea along with associated symptoms such as vomiting, fever as well as detailed food intake and hygiene practices of both mothers and children was collected on specially designed questionnaire. Patients were then divided by simple randomization based on random numbers into three groups (A, B and C) of fifty patients in each on the basis of treatment modality. Group A: Fifty patients received zinc 1-2mg/kg/day orally five days as per WHO protocol along with ORS and/or IV fluids if req.

Group B:Fifty patients were given 1-2 sachets /day of probiotics according to age (<1 years old - 1 sachet) for five days along with ORS and /or IV fluid if required. The composition of probiotics sachet was: saccharomyces boulardii

Group C: Fifty patients were administered a combination of zinc and probiotics in doses mentioned above for five days along with ORS and /or IV fluid as required.

Response to treatment was taken as the decrease in frequency of stools; that is less than three formed stools in a day. Data was analysed using SPSS version 21.0. For comparative analyses chi-square test was used, p value <0.05 was considered significant. Frequencies of categorical variables evaluated in this study are expressed in percentages.

RESULTS:

The study was performed on 150 patients with acute diarrhoea divided randomly into three groups of fifty patients in each. In Group A, in which zinc suspension was given, in the first twenty four hours two patients responded with decrease in diarrhoeal episodes to less than three stools per day as well as improvement in its consistency while maximum therapeutic effect was seen on 3rd day where out of total fifty patients thirty nine (78% of group population) children showed response to therapy, only eleven children did not respond and still had more than 5 episodes of watery diarrhoea even after 72 hours of treatment as shown in Figure 1.

In group B, in which only probiotic was given, initially in the first 24 hours no response to therapy was observed. However on the 2nd day six patients had decrease in frequency of diarrhoea followed by ten more children recovering in the next 24 hours (32% of group population) as shown below in Figure 1. However thirty four children did not show improvement even after 72 hours of starting the treatment.

In group C where combination of Zinc suspension and probiotic was given, response to therapy was appreciable in first 24 hours where five children recovered from watery diarrhoeal episodes and by the end of third day all fifty patients except for two (96 % of group population) had less than 3 stools per day with semi solid consistency as shown below in Figure 1.

On comparison between Group A and Group B after 72 hours of starting treatment *p* value is <0.05 that is considered statistically significant. Also when Group C was compared with Group A and Group B respectively, *p* value was < 0.05

which shows that combination therapy is clinically more efficacious in terms of decreasing stool frequency in patients with acute diarrhoea as compared to monotherapy with either.

Amongst the total study population of 150 patients, male patients predominate with a total of 87 (58%) while 63 (42%) were female; giving male to female ratio 1.38:1. Gender wise, there was no significant difference amongst the patients. Moreover, 66 out of 150 (44%) patients were

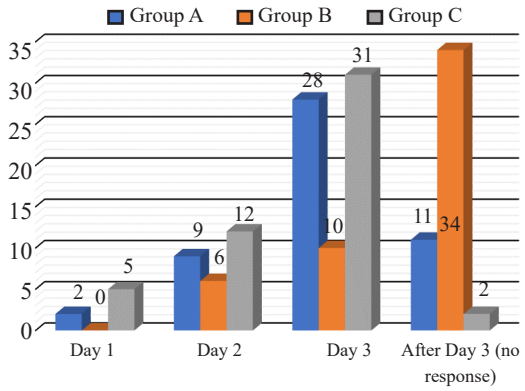

Figure 1: Comparison between Group A, B and C in terms of number of patients showing response to therapy (decrease in frequency, that is less than three formed stools per day) on day 1, 2 and 3

6-12 months old while 84 (56%) patients were between 12 to 120 months old.

Table 1 enlists frequencies of different variables like personal hygiene of mothers and children, sources of food and water accounting for acute diarrhoea. Amongst the variable observed during this study that contribute to acute diarrhoea as tabulated in

Table 1, 123 children (82%) were not using boiled water while 64% and 78% of the mothers were not washing their hands prior to food preparation and feeding respectively. In the children over 12 months of age, only 57% and 29% of the children were in a habit of washing their hands after urination and taking meals respectively. It was also observed that only 32% of the children suffering from acute diarrhoea were consuming home made food items while 68% of the children bought the food from outside.

DISCUSSION:

In the present study, clinical efficacy of zinc suspension and probiotic monotherapy has been compared with combination therapy in children with acute diarrhoea. It has been shown in this study that by the end of 3rd day, nearly all patients in group C who were given combination of zinc suspension and probiotic showed decrease in frequency to less than three stools/day as well as improvement in consistency of stools. In Group A patients who received oral zinc suspension thirty nine patients responded to monotherapy while eleven patients continued passing watery stools even after 72 hours of starting the therapy. While in Group B patients who were given probiotics alone no significant improvement was seen even after 72 hours of therapy. So according to our findings though oral zinc suspension alone is effective in decreasing frequency and duration of diarrhoea but combination of zinc suspension and probiotics is clinically more effective in pediatric acute diarrhoea.

Our findings regarding effectiveness of oral zinc therapy in acute diarrhoea in children is in accordance with Karamyyar*et al*[13] who showed the effectiveness of zinc therapy in acute diarrhoea and fluid deficiency states. They found increase in serum zinc level after zinc treatment in diarrhoeal children. Similar findings have been reported in other studies[14-17]. Further, Habib *et al* [10] showed that zinc decreases the diarrhoeal episodes with faster recovery rates in any available preparation, however better results have been seen with suspension form in terms of patients' compliance. While this was in discordance with the study by Patel *et al*[18], who found that the total extent of diarrhoea was not different in placebo and zinc groups; the main duration in the zinc group was 4.34 days and that in the placebo group (which received ORS only) was 4.48 days. Also Singh K *et al* in their study concluded that oral zinc therapy has no appreciable outcome on frequency and duration of childhood acute diarrhoea[19].

Zinc is an important constituent of normal diet having pivotal action in the synthesis and repair of cell constituents. Exact mechanism of action of zinc in acute diarrhoeal states is still not known but it has been reported in literature that zinc improves the overall intestinal absorptive capacity as well as induces the synthesis of cytokines involved in mucosal protection and repair. All these mechanisms may account for the beneficial role of zinc supplementation in children with acute diarrhoea[9]. WHO and United Nations Children's Fund have recommended zinc supplementation for the management of diarrhea since 2004; yet, its usage remains scarce.

In our study Group B fifty children with acute diarrhoea were administered probiotics along with ORS. It was found that only sixteen children showed decrease in frequency of stools in 72 hours while thirty four children did not respond in the mentioned time period. So it is concluded in this study that probiotics alone are not effective in reduction of the acute diarrhoea in children. This is in agreement with the findings in other studies which also showed that probiotic supplementation has no role reducing duration of diarrhea or stool frequency in acute infectious diarrhoea in children[20-21].While in study by Yazar *et al*, it was concluded that probiotics are equally effective as zinc supplementation in reduction of duration and frequency of diarrhoeal episodes in childhood acute infectious diarrhoea[22]. The effectiveness of S boulardii in reducing the duration of diarrhea and improving the consistency of stools in children with acute diarrhea has been established in other studies as well [23-25].

CONCLUSION:

Acute diarrhoea was found to be more prevalent in children with poor hygiene and dietary habits. It was observed that 82% of children presenting with acute diarrhoea were using unboiled water. Regarding treatment modalities, combinations of zinc + probiotics therapy is more effective in children with acute diarrhoea than either alone; while among zinc and probiotics therapy, zinc is superior in terms of clinical efficacy than probiotics alone.

LIMITATION OF STUDY:

This study has been conducted on small group of subjects so further studies on larger scale should be conducted so that results can be extrapolated to larger population.

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Original Article

To Evaluate Povidone-iodine Effect On Post Appendectomy Surgical Site Infection

Rizwanullah Junaid Bhanbhro, Khalil Ahmed Almani, Sadia Kazi, Navaid Kazi, Sumayya Kazi

Objective: Evaluating the effects of Povidone- Iodine against the surgical site infection in post- appendectomy wound infection.

Study design: Randomized clinical trial

Place and duration: Department of Surgery, Isra University Hospital Hyderabad from January 2016 to December 2017.

Subjects and Methods: Patients of acute appendicitis with classical clinical presentation were selected according to inclusion and exclusion criteria. 60 patients were those in which wound was irrigated with 1% povidone-iodine solution versus 60 patients in whom wound not irrigated with it before skin closure. Data was analyzed on SPSS 22.0 using Student t-test and Chi- square test respectively. Data was analyzed at 95% confidence interval (P=0.05). P-value of =0.05 was taken statistically.

Results: Mean ± SD age of control and cases was noted as 22.5 ± 7.5 and 23.5 ± 6.5 years respectively (P=0.86). Male and female population in control and cases were noted as 45 (75%) and 15 (25%) & 47 (78.33%) and 13 (21.66%) respectively (P >0.05). Grade 4 pus discharging wound infection was noted in 3.33% in control compared to 1.66% in cases (P= 0.87). Normal wound healing (grad 0) was noted in 37 (61.6%) and 43 (71.6%) of control and cases respectively. In control grade 1-4 lesions were noted in 38.4% compared to 28.4% in cases (P < 0.05).

Conclusion: Simple irrigation of appendectomy wound with 1% povidone- iodine significantly prevents against the surgical site infection and pus formation.

Key words: Surgical site infection, Povidone-Iodine, Appendectomy

INTRODUCTION:

Surgical site infection (SSI) is one of the commonest post operative complication of appendectomy.[1,2] A prevalence of 18- 20% of SSI has been reported despite prophylactic use of antibiotics and improved sterilization techniques.[3,4] Povidone-iodine is amongst the widely used antiseptic for wound sterilization. Povidone-Iodine is composed of 1% iodine, iodide and polyvinyl pyrrolidone dissolved in sterilized water. Povidone- iodine shows bactericidal activity against wide range bacteria and other micro organisms. Its effect begins within thirty seconds of application and lasts for as long as 14 hours.[4,5] The efficacy of Povidone-Iodine solution is well established on wounds with intact surrounding skin,[5,6] but studies studied its use as prophylactic agent against bacteria in SSI are limited.[7,8] This might be due to safety concerns in open wounds.[9] The bacterial killing activity of Povidone-Iodine increases with more degree of dilutions. For example 0.1-1% dilute Povidone-Iodine solutions are reported more bactericidal than 10% concentrated Povidone-Iodine solutions.[4,5] Povidone-Iodine is neither cytotoxic nor retards the wound healing at high concentration. It is approved by the Food and Drug Administration (FDA) as bactericidal for superficial and acute wounds for short term duration. [9-11] As the appendectomy is termed as contaminated surgery and oftently performed by young surgeons,[1] hence there are more chances of surgical site infection (SSI). SSI creates discomfort to patients, increases duration of morbidity and increases economical loss and discourages the surgeons. Post operative hospital stay and cost of procedure is increased by the SSI.[11,12] As the appendectomy is a widely used surgical procedure particularly in the youngsters, hence the SSI is problematic. The present study was designed to compare the efficacy of Povidone- iodine solution against the frequency of superficial surgical site infections in post – appendectomy patients at our tertiary care hospital. Comparison was made between those in which wound was irrigated with 1% povidone-iodine solution versus those in whom wound was not irrigated with it before skin closure. The study was of clinical importance as if 1% povidone-iodine decreases the SSI, then it will be a simple and inexpensive remedy for prevention of surgical site infection.

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SUBJECTS AND METHODS:

The present randomized controlled trial was conducted at the Department of Surgery, Isra University Hospital Hyderabad. Isra University Hospital is a tertiary care hospital that caters hundreds of thousands patients each year. Surgical wards are one of the busiest units of the hospital. The study was conducted over duration from January 2016 to December 2017. Ethical approval was taken from the Institute`s ethical committee. Patients of acute appendicitis with classical clinical presentation of pain in right iliac fossa; nausea, vomiting, and fever were included. 60 patients were those in which wound was irrigated with 1% povidone-iodine solution versus 60 patients in whom wound not irrigated with it before skin closure. Age 10- 25 years, volunteer subjects with clinical diagnosis of acute appendicitis were included. Appendectomy was performed in the emergency surgical operation theater. Exclusion criteria were defined as; appendicular abscess, perforated appendix, inflammatory bowel disease, and systemic disease such as the diabetes mellitus were excluded. Malnourished patients were also excluded. Appendectomy was performed by standard surgical procedure under general anesthesia. Grid iron incision was used for the open appendectomy. All of patients received prophylaxis of cephalosporin antibiotic (1 gram) intravenously for prevention of infection. Patients were categorized into control and cases by random selection. After surgical procedure, the wound was irrigated with 1% povidone-iodine solution (cases) versus those in whom wound not irrigated with it (control) before skin closure. In cases, the subcutaneous tissue was irrigated with 1% diluted povidone- iodine (4- 5 ml), while controls were not. Povidone- iodine solution was taken into 5 ml disposable syringe (BD, USA), and was sprayed into the subcutaneous wound. Povidone- iodine was applied and exposed for 2- 3 minutes. In control patients, the wound was not irrigated. Skin was closed by surgical sutures (continuous sub cuticle) in both control and cases. Dressing was applied to the wound site and tethered with paper plaster. Post operatively, 2 grams of cephalosporins were given intravenously for infection control in both groups. Surgical procedure was performed by consultant surgeon in the operation theater. Wound site was observed for the surgical site infection (SSI), at the time of discharge, and on successive follow up visits in the outpatient clinic till 30th post operative day. Surgical site wound was classified as per Southampton Wound Grading System.[12] All volunteers were asked to sign the consent form. Form was signed either by the patient itself or by his legal heirs. Signing of consent form was mandatory for inclusion in research protocol. Patient's biodata, diagnosis, vitals, surgical procedure, antibiotic prophylaxis, discharge and follow up and surgical site infections were noted in a pre- structured proforma. Confidentiality of patients data was strictly maintained in accordance to the "Helsinki`s declaration". Continuous and categorical variables were analyzed on SPSS 22.0 (Statistical Package for Social Science, Inc. Chicago, IL, USA) using Student t-test and Chi- square test respectively. Data was analyzed at 95% confidence interval (P=0.05). P-value of =0.05 was taken statistically.

RESULTS:

Mean ± SD age of control and cases was noted as 22.5 ± 7.5 and 23.5 ± 6.5 years respectively (P=0.86). Subjects in control and cases were matched for age, body weight and gender (table 1 and Fig1). Systolic and Diastolic BP and Random blood glucose (RBG) results are presented in table 1. Gender distribution is presented in fig 1. Male and female population in control and cases were noted as 45 (75%) and 15 (25%) & 47 (78.33%) and 13 (21.66%) respectively (P >0.05). Wound grading of control and cases according to Southampton grading 0- 4 is presented in table 2. Grade 0, 1 and 3 were found less in cases (P <0.05) compared to control subjects. Grade 4 pus discharging wound infection was noted in 3.33% in control compared to 1.66% in cases (P= 0.87). Fig 2 shows the distributio of Southampton wound grading of study subejcts. Normal wound healing (grad 0) was noted in 37 (61.6%) and 43 (71.6%) of control and cases respectively. In control grade 1-4 lesions were noted in 38.4% compared to 28.4% in cases (P < 0.05).

	Control	Cases	P-value
	Mean± SD	Mean± SD	
Age (years)	22.5 ± 7.5	23.5±6.5	0.86
Body weight (kg)	54.7±12.5	57.9±10.5	0.79
Systolic BP (mmHg)	117.9±11.04	115.5±10.8	0.91
Diastolic BP(mmHg)	69.15±10.0	71.5±9.5	0.45
RBG (mg/dl)	137.8±15.8	128.53±56.47	0.74

Table 1. Demographic characteristics of control and cases (n=120)

	Control	Cases	P-value
	No. (%)	No. (%)	
Grade 0-(healing normal)	37 (61.6%)	43 (71.6%)	0.0001
Grade 1-(Mild bruising)	9 (15.0%)	7 (11.6%)	0.003
Grade 2-(Erythema)	7 (11.6%)	6 (10.0%)	0.931
Grade 3-(Serous discharge)	5 (8.3%)	3 (5.0%)	0.049
Grade 4-(Pus discharge)	2 (3.33%)	1 (1.66%)	0.87

Table 2. Wound grading in control and cases (n=120)

DISCUSSION:

In present randomized clinical trial, the efficacy of 1% Povidone- iodine against surgical site infection (SSI) was noted in post- appendectomy patients. The presents study shows wound grade 0, 1 and 3 were found less in cases (P <0.05) compared to control subjects. In present study, normal wound healing (Soutampton grade 0) was noted in 37 (61.6%) and 43 (71.6%) of control and cases respectively that was insignificant (P>0.05), but the severity of infection was

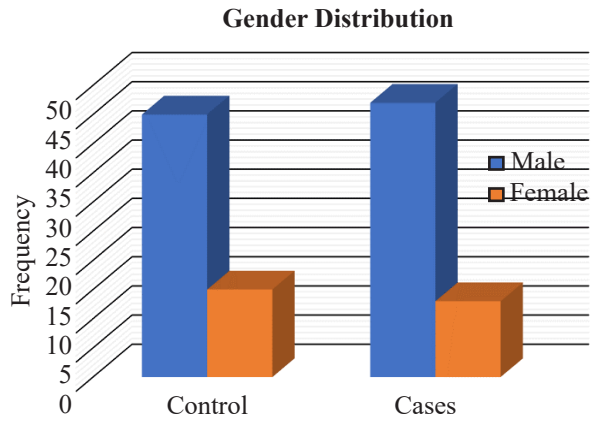

Fig 1. Bar graph showing gender distribution of study subejcts

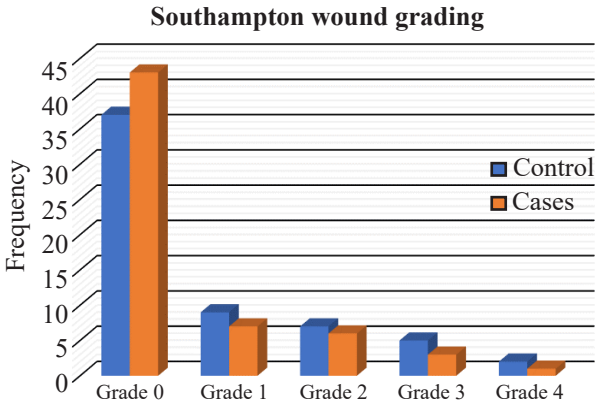

Fig 2. Southampton wound grading of study subejcts

significantly less in 1% Povidone- Iodine treated wounds. Grade 1-4 lesions were noted in 38.4% controls compared to 28.4% in cases ($P < 0.05$) that was statistically significant. In present study, the grade 4 pus discharging wound infection was noted in 3.33% in control compared to 1.66% in cases ($P = 0.87$). This is in agreement with previous studies[13-14] which has reported frequency of wound infection of 2.1 to 20% in post- appendectomy subjects. However, a recent study[12] has reported a frequency of 15.1% of wound infection which is high and is not in keeping with present and previous studies as above.[3,13,14] A previous study from Lahore, reported 13.1% SSI in open appendectomy cases,[15] that is also high compared to 3.33% in control and 1.66% in cases. Previous studies[16, 17] reported SSI in 5% and 6.4% of open appendectomy respectively. The frequency rates of both studies are consistent with the present study. Another study[3] reported high frequency of 18% of SSI among pediatric populace; this is in contrast to low frequency of SSI noted in the present study. These controversies are because of different study populations as pediatric versus adults, different severity of appendicitis cases, postgraduate versus consultant surgeons and post operative care differs from hospital to hospital. In our tertiary care, the post operative care is par excellence hence the overall SSI was noted low. Another reason of varied presentation of post appendectomy SSI is inconsistent and non standardized definitions of surgical site wound infection. In above studies[3, 13, 14] the criteria of wound infection were not clearly mentioned. Another reason matters is the comparison of SSI of laparoscopic versus open appendicectomy that is incomparable.[18] In present study, surgical wound infection was in accordance to Southampton wound grading system. According to Southampton wound grading, the normal wound healing (grad 0) was noted in 37 (61.6%) and 43 (71.6%) of control and cases respectively. In control grade 1-4 lesions were noted in 38.4% compared to 28.4% in cases ($P < 0.05$). These findings are consistent to previous studies.[17, 18] Purulent discharge from the wound of post appendectomy is the hallmark of ongoing infective process of SSI. In present study, the grade 4 pus discharging wound infection was noted in 3.33% in control compared to 1.66% in cases ($P = 0.87$). Pus discharge indicates persistent bacterial proliferation at the wound site with release of inflammatory mediators and toxins by the microbial pathogens.[5] Pus is a sure sign of SSI. Application of antiseptic agent such as 1% Povidone- Iodine inhibits the bacterial growth and halts the process of SSI and formation of pus in the wound cavity.[5,9] In present study, 1% of Povidone- Iodine significantly reduced the surgical site infection and pus formation. A previous study[19] reported efficacy of Povidone- Iodine solution against SSI, as they reported infection rate of 15.1% in control compared to 2.9% in cases. This frequency is comparable to 3.33% SSI in cases noted in the present study.[19] The findings of present study are also supported by previous study[20] as they reported demonstrated the Povidone-iodine application was effective in reducing the SSI. The only limitation of present study is the small sample size. However, results are worth to report as simple application of Povidone- Iodine is useful against the surgical site infection.

CONCLUSION:

The present study concludes that simply the irrigation of appendectomy wound with 1% povidone- iodine significantly prevents against the surgical site infection and pus formation. Future studies with large sample size are recommended for further clarification of efficacy of Povidone- iodine against the surgical site infections.

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Original Article

MRI An Imaging Tool To Evaluate Cerebral Changes In Victims Of Heat Stroke Presenting With Cerebral Symptoms

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ABSTRACT:

Heat stroke usually presents as medical emergency that causes altered cerebral status and deterioration of multiple organ functions. Heat stroke leads to many different physiological changes within the body, some of which result in neurologic dysfunction. The imaging characteristics of neurological changes of heat stroke are not well documented in literature although the pathophysiologic mechanism of neuronal damage is fairly well understood. We conducted a study to evaluate the imaging appearances of human brain after heat stroke on MRI presented with cerebral symptoms.

Material and methods: The retrospective study conducted in radiology department of Ziauddin university hospital from May 2015 till July 2016. All the patients with heat stroke presented with neurological deficit were underwent MRI brain, evaluated by two senior radiologists.

Results: 56 patients were included in study, 12 female and 44 male, all patients had clinical symptoms of fever and most of them had additional symptoms of altered level of consciousness. Out of 54 patients, 8 patients had normal MRI brain. 6 patients presented with bilaterally symmetrical hyperintense signals on T2WI in thalami and basal ganglia. 2 patients demonstrated focal high signal intensity in pons representing pontine myelinosis, rest of the patients presented with cerebral or cerebellar infarcts.

Conclusion: Many cerebral lesions can result as cerebral damage of heat stroke which includes cerebral infarct, white matter changes, haemorrhages and inflammatory reactions, in these clinical scenarios MRI would be imaging modality of choice to evaluate the disease pattern.

Keyword: Heat stroke, brain lesions, ischemia.

INTRODUCTION:

Heat stroke is characterized by an elevated core body temperature over 40°C. Heat stroke is potentially a life-threatening condition and usually presents as medical emergency that causes altered cerebral status and deterioration of multiple organ functions (1-2). Heat stroke leads to cerebral damage due to its exceptional susceptibility to injury. Neurologic abnormalities include confusion, seizures, or altered mental status. Several pathophysiological mechanisms are involved in causing cerebral injury like, altered haemostasis resulting in small vessel ischemia and can present as diffusion restriction on MRI, direct injuriousness effect of heat to certain cell types which contain abundant amount of heat shock proteins (e.g., Purkinje cells of cerebellum), release of interleukin 1 generating inflammation and apoptosis, leakage of cerebrospinal fluid as a result of cytokine secretion serving to prolong vasogenic ischemia resulting in ischemic changes (2). The most vulnerable organs to heat damage are cerebellum, basal ganglia, hypothalamus and limbic system (3, 6). In addition thalamus, cerebral cortex, brain stem, and anterior horn cells of spinal cord are also susceptible to heat injury.

Due to global climatic change, severe heat wave with temperatures as high as 49 °C (120 °F) struck Sindh province and its capital city, Karachi in June 2015 and 2016. A large number of people became the victim of heat wave. We conducted a study to evaluate the imaging appearances of human brain after heat stroke on MRI presented with cerebral symptoms.

MATERIAL AND METHODS:

This is a retrospective review done in radiology department at ziauddin university hospital from May 2015 to July 2016. As the institute is a tertiary care centre and present in the centre of city, so during the period of heat wave, a large number of patients with heat stroke were shunted to the hospital. All clinically diagnosed patients of heat stroke having neurological symptoms were underwent MRI brain. MRI examination was conducted between days 0 to fifth day of admission depending upon the evolution of neurological symptoms. MRI findings were evaluated by two senior radiologist having experience of more than five years. Total 56 patients were enrolled in study; patients of either gender were included in study. All clinically diagnosed patients of heat stroke having neurological symptoms were

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underwent MRI brain for possible imaging findings. Paediatric age group patients of below 14 years were excluded from study. After taking informed consent from all patients and MRI brain was performed with 1.5 Tesla scanner. Typical brain protocol including axial T1–weighted spin echo, axial and sagittal T2–weighted spin echo, axial, coronal and sagittal contrast enhanced T1-weighted images (as required), coronal FLAIR images were obtained. DW and ADC imaging was performed in all patients using a single-shot echo-planar (EPI) pulse sequence (TR/TE= 3000/90 ms), with matrices of 128×128 and a section-thickness of 5 mm with a 1-mm intersection gap.

RESULTS:

Out of 56 patients, 12 (21.4%) were female and 44 (78.5%) were males, with mean age of 36 years. Almost all of the patients presented with high grade fever among them 32 (57%) developed altered level of consciousness, 16 (28.5%) patients has additional symptom of seizures and 4 (7.1%) patients had delirium.

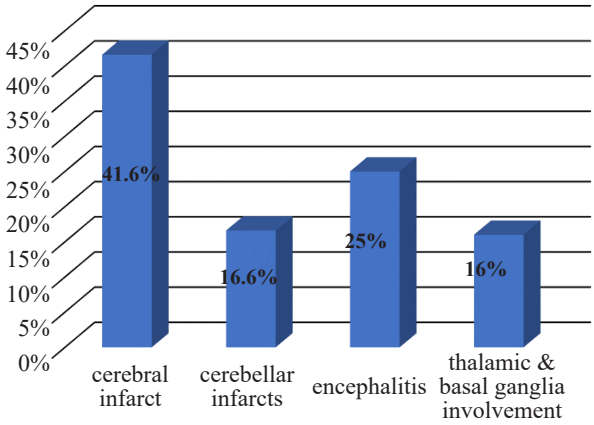
On evaluating the MRI of affected patients 8 (14%) patients had absolutely normal MRI brain whereas bilaterally symmetrical hyperintense foci in thalmi and basal ganglia were observed in 6 (10.7%) patients, focal high signal intensity in pons on T2WI was seen in 2 (3.5%) patients, acute cerebral and cerebellar infarcts showing diffusion restriction was present in 12 (21.4%) and 6 (10.7%) patients respectively. Foci of punctate haemorrhages showing signal drop out on SWI were present in 8 (14.2%) patients. Areas of diffusion restriction in hippocampi were appreciated in 5 (8.9%) patients and 9 (16%) patients developed encephalitis during hospital stay. Out of 56 patients 12 (21.4%) patients were unable to survive. Among non survivors 8 (66.6%) were males whereas (33.3%) were female. Large cerebral infarcts were the pronounced imaging pathology in non survivors seen in 5 (41.6%) cases, followed by encephalitis in 25% (n=3) cases. Whereas rest of the non survivors had cerebellar infarcts in 16.6% (n=2) cases, basal ganglia and thalamic involvement in 16.6% (n=2) cases.

DISCUSSION:

Several pathophysiological mechanisms are involved in causing cerebral injury. The heat stress causes diversion of blood from the splanchnic vessels to disseminate in periphery vasculature in order to disintegrate heat effect. As a result of heat stroke there is increase release of heat shock proteins with increase in production of cytokines (2) resulting in splanchnic ischemia which may lead to cerebral infarct which can present as areas of diffusion restriction on DWI/ADC sequences. The body will develop sever inflammatory response and sepsis like reaction in consequence of endotoxin release. Many mechanisms has been proposed to cause brain damage by heat stress. Increased cytokines release like interleukin 1 may lead to apoptosis or cell death, In addition increase cytokines can

MRI FINDINGS	FREQUENCY
Normal MRI brain	14.2% (8/15)
Hyperintense areas in thalmi and basal ganglia	10.7% (6/56)
High signal in pons on T2WI	3.5% (2/56)
Diffusion restriction in cerebral corteices	21.4% (12/56)
Diffusion restriction in cerebellar hemisphere	10.7% (6/56)
Punctate foci of hemorrhages	14.2% (8/56)
Areas of Diffusion restriction in hippocampi	8.9% (5/56)
Encephalitis	16.0% (9/56)

Tables: Findings on MRI brain in victims of heat stroke:



MRI features in non-survivor:

result in damage to blood-brain barrier or blood–cerebrospinal fluid (CSF) barrier which leads to vasogenic oedema (8,9) which may result in brain ischemia. During research on rabbit cerebellum the results showed that Purkinje cells may have a key role in thermal injury repair. In cerebellum heat stress cause direct damage to the purkinje serving to hypoxic ischemic injury and may lead to cerebellar symptoms (8).

MRI plays key role in detection of neurological abnormalities caused by heat stroke. MRI findings include, cerebral infarcts, lesions in dentate nuclei, haemorrhages, lesions in cerebellar hemispheres and cerebellar peduncles [5]. The results of this study are in consensus with previous studies.

A case report from 2003 of a patient with heat stroke revealed bilateral external capsule, bilateral putamen, and a bilateral cerebellar process with haemorrhagic deposits on T2- and T1WI and some enhancement on gadolinium images. The authors proposed that small vessel ischemia was the leading cause of imaging appearances (10).

A study conducted on 9 patients by Jun Li et all in 2015 revealed punctate haemorrhage in brain stem evident by areas of signal susceptibility on SWI, diffusion restriction on DWI/ADC images in the left centrum semiovale, symmetric lesions in cerebellar peduncles and acute massive cerebral infarction. Similar spectrum of imaging appearances

was detected in all patients enrolled in the study (11).

This study is a valuable literature as limited number of cases was reported in the literature that describes the imaging appearances of cerebral damage as a result of heat stress. Heat stroke has generally reported in case reports or small case series. But there are several limitations to this study like the MRI findings of survivors were not followed, the sample size was small and paediatric age group patients were excluded from the study.

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Original Article

Oral Hygiene Practice And Perceived Oral Malodour Among Dental And Medical Undergraduate Students Of Bahria University Medical And Dental College

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ABSTRACT:

Objective: To determine the differences of self-perception of halitosis and oral hygiene practices among the medical and dental undergraduate students.

Methodology: A cross-sectional study conducted over duration of 9 months amongst the medical and dental undergraduate students of Bahria University Medical and Dental College. The questionnaires were distributed to 298 students. Questionnaire employed for this study was adopted and modified from the study conducted by Khalid Almas et al. Descriptive statistics were checked by means of percentages and frequency for all variables. Chi-square test was applied to check significant difference among the responses given by the medical and dental undergraduate students.

Results: The response rate for the survey was about 85%. 55% of dental and 17 % of medical students were able to smell their breath. About having examination by dentist about 73% of medical students agreed as compared to 53% of dental students. Both medical and dental students preferred having examination done by the dentist. For management of halitosis, dentist was preferred by 62% of the dental students, while 97% of the medical students did not agree. 62% of the dental students preferred using traditional medications, while 82% of the medical students preferred using self-medications for treatment.

Conclusion: The results suggest that there is not a high level of agreement among dental and medical students concerning the detection and management of halitosis. Although large percent of the respondents claimed to be aware of dentistry, our findings revealed low level of knowledge and attitude to Dentistry by the medical undergraduate students. Efforts should be made towards closing this knowledge gap to attain effective oral health.

Key words: Halitosis, oral hygiene, awareness, dental students, medical students

INTRODUCTION:

Halitosis can be commonly referred as an unpleasant odor or smell that is coming from the mouth [1]. It is one of the common most problems affecting the general population at large. It has been found that about 50 % of people worldwide are affected by halitosis [2]. Moreover in a study initiated in Japan has revealed that about 47 % of individuals suffer from this condition[3].

There are numerous causes identified responsible for the existence of this condition. The most common intra-oral reasons being accumulation of food products within the mouth , reduced salivary flow rate; inadequate cleaning of denture or other appliances, occurrence of several decay, exhibition of calculus, periodontal conditions, ulcerations or soreness in mouth, dry socket & tongue coating[4,5,6].

Extra oral causes of halitosis typically includes usage of medications such as antidepressants, anti-hypertensive, narcotics, habit of betel nut and tobacco products or due to presentation of any underlying disease such as diabetes, upper respiratory tract infections, leukemia, alcohol consumption and disease related to gastro intestinal tract such as gastro-esophageal reflex disorder [7,8].

Several microbes have been recognized as causative factor that leads to halitosis which includes “Porphyromonas gingivalis, Porphyromonas endodontalis, Treponema denticola, Fusobacterium nucleatum , Prevotella intermedia, Bacteroides loescheii, Enterobacteriaceae, Tannerella forsythensis and Eikenella corrodens” [9,10]. Additionally decomposition of food products by many of these gram negative bacteria on the surface of tongue or within the

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periodontal pockets may cause production of volatile sulphur bi-products such as Methyl mercaptan and Hydrogen sulphide that initiates production of potential "malodour " coming from the mouth[7,10,11,12,13].

Moreover halitosis can be categorized into three types, which are True halitosis, Pseudo halitosis and halitophobia. True halitosis is identified when malodor can be felt visibly. It is described as Pseudo halitosis where it remains un-observed visibly and lastly regarded as Halitophobia, where the patients are actually certain of having malodour although in actual it's does not exist[13, 14, 15].

Halitosis can have major impact on a person's daily routine life, as it can hinder and the effect the communication skills and self-reliance of an individual. Prompt and timely detection plays a key role. However due to lack of public awareness, many times it remains untreated or gets masked due to usage of different mouthwashes available in the market. Therefore the aim of this study is to learn and acquire about the oral hygiene practice amongst the students and identify the occurrence of halitosis and to assess the difference in awareness and management among the medical and dental undergraduate students of Bahria University Medical & Dental College in Karachi.

METHODOLOGY:

It was a cross- sectional study carried out over a time period of 9 months amongst the medical and dental undergraduate students of Bahria University Medical and Dental College. The questionnaires were distributed to 350 students after their lectures and lab sessions. 298 filled questionnaires were received which included 129 dental and 169 medical students while 52 were received unfilled.

The main idea of the research was explained to all students before asking them to fill the questionnaires. Verbal consent was taken from students before distributing the questionnaires. The students were assured that their anonymity will be retained. Formal Approval of the study was obtained from the Ethical Review Committee of Bahria University Medical and Dental College (ERC 34/17) before starting the study, which was carried out in accordance with the Declaration of Helsinki.

It required five to ten minutes to completely fill the questionnaires. Survey utilized for this study was adopted and modified from the study conducted by Khalid Almas et al.[16] Healthy dental and medical undergraduate students were included in this study, while students who did not give consent for study along with those having widespread periodontal problems, numerous or extensive carious lesion, undertaking any medication or suffering from any medical conditions like diabetes were all excluded from the study.

The initial part of survey comprised of the demographic details of the student which included the age, gender, and year at medical or dental college were asked. The next part of the survey was more focused upon the questions related to oral hygiene which included; smelling one's own breath, examination of bad breath by dentist of physician, mode of treatment received, treatment by whom, bad breath effecting personal life, time breath found to be worst, frequency of brushing teeth, usage of toothpaste, mouthwash and habit of smoking.

Sample size calculation was done using OpenEpiTM (v-3). All the responses were coded and statistical analyzed using SPSS (v-23). Descriptive statistics were checked by means of percentages and frequency for all variables. In order to check significant difference among the responses given by the medical and dental undergraduate students' Chi-square test was applied. P-value less than 0.05 was considered significant.

RESULTS:

The response rate for the survey was about 85% (n= 298) out of 350 completely filled forms were received. Table 1 shows the results in which 43% (n= 129) were dental students while about 57% (n= 169) were medical students.

In response to the question asked related to smelling one's own breath, significant difference was noted as 55% (n= 71) of dental students responded positively when compared with 17% (n= 28) of medical students. Though 55% (n=71) of dental and 83% of medical students stated not being able to smell their breath. (P value 0.000)

When inquired about having examination done by dentist considerably about 73% (n= 123) of medical students agreed as compared to 53% (n= 68) of dental students (P-Value 0.000). In response to checkup by general practioner both medical and dental students strongly denied having examination done by medical practioner. (P- Value 0.000)

For the management for bad breath by dentist, 62% (n=80) of the dental respondents agreed, while 97% of medical students did not agree. (P-value 0.000)

Approach of treatment option for halitosis revealed; 62% (n=80) of dental students preferred using traditional medications, while 82% (139) of the medical students preferred using self-medications for treatment (P-value 0.000).62% (n=87) of dental students felt bad breath to affect their social life while 97% of the medical students felt it did not affect them.

Moreover table 2 showed that the frequency of teeth brushing was 78% (n=101) by dental students and 60% (n=101) by the medical students. Significantly 60% of medical and dental students preferred using mouthwash. While 85% (n= 109) of the dental students complained of bleeding gums but reported by only 44% (n= 74) of the medical students.

DISCUSSION:

Limited data is available in Pakistan in relation to Halitosis. It is often neglected and masked due to consumption of mouthwashes and other products available widely within

Queries:		Dental Students (n=129)	Medical Students (n=169)	P-value
Patients ability to smell their breath	Yes	71, 55.0%	28, 16.6%	0.000
	No	58, 45.0%	141, 83.4%	
Examination for bad breath by dentist	Yes	68, 52.7%	123, 72.8%	
	No	61, 47.3%	46, 27.2%	
Examination for bad breath by practitioner	Yes	63, 48.8%	17, 10.1%	
	No	66, 51.2%	152, 89.9%	
Treatment for halitosis by practitioner	Yes	26, 20.2%	20, 11.8%	0.049
	No	103, 79.8%	149, 88.2%	
Treatment for halitosis by dentist	Yes	80, 62.0%	5, 3.0%	0.000
	No	49, 38.0%	164, 97.0%	
Treatment using self-medications	Yes	49, 38.0%	139, 82.2%	
	No	80, 62.0%	30, 17.8%	
Treatment using Traditional medications	Yes	69, 53.5%	51, 30.2%	
	No	60, 46.5%	118, 69.8%	
Breath affecting social life	Yes	87, 67.4%	7, 4.1%	
	No	42, 32.6%	162, 95.9%	

Table 1: Frequency of responses of healthcare professionals about the diagnosis and treatment of halitosis

Queries:		Dental Students (n=129)	Medical Students (n=169)	P-value
Tooth brushing	Yes	101, 78.3%	101, 59.8%	0.001
	No	28, 21.7%	68, 40.2%	
Usage of Mouthwash	Yes	78, 60.4%	100, 59.1%	0.000
	No	50, 38.7%	69, 40.8%	
Habit of Smoking	Yes	8, 6.2%	12, 7.1%	0.759
	No	121, 93.8%	157, 92.9%	
Presence of Bleeding gums	Yes	109, 84.5%	74, 43.8%	0.000
	No	20, 15.5%	95, 56.2%	

Table 2: Frequency of responses of healthcare professionals about dental awareness

the market. Despite the fact correct assessment and detection of malodour still remains crucial, as it is identified mostly through self-perception of the individual. However many primary care professional do not consider it as an effective means of diagnosing as it is not consistent and many underlying reasons could be responsible for occurrence of this condition.

Moreover a study commenced by Greenman et al. stated that halitosis is one of the utmost common problem described by patients to the dentists[17]. Another study initiated on dentist practicing in United States revealed that 41% of dentist had at least six patients presented complaining of bad breath[18].

In the current study no significant association was noted among genders, which is similar to study conducted in Thailand[19] and turkey [20].

Self-perception plays a key role in identifying the presence of any underlying problem. In the current study majority of dental students which were around 55 % were able to smell their breath when equated to medical students, where majority were not able to smell their breath. This is similar to study conducted by Penmetsa et al[21] and Sujatha et al[22] who concluded that only 25% of the medical students had good oral health awareness, this can be due to lack of awareness and interest and also possibly due to busy study schedules.

Surprisingly many medical students wanted to visit a dentist for examination of oral cavity rather than general physician, this could be linked to the fact that social media has increased

awareness for maintaining good oral hygiene, this is in correspondence to a study conducted by Doshi et al, in which it was stated that about 80% of medical students had visited the dentist for dental checks[23].

For treatment of bad breath, many dental students sought a dentist to examine them and treat them accordingly, this finding is similar to survey conducted by Andreas et al, where it was concluded by the author that 90 % of dentist believed that halitosis is best dealt by a dentist only[24]. However majority of the medical respondents did not reach agreement upon having treatment done by a dentist, which could be attributed to the fact that medical students have lower level of knowledge regarding dentistry and lacks awareness regarding different methods of maintaining good oral hygiene, furthermore it can also be due to their busy work schedules or fear of having dental treatment done[25]. This is similar to study conducted by Elijah et al, who identified that medical undergraduates have poor responsiveness with respect to oral health problems[26].

Different treatment strategies are available for treating malodour ranging from basic advice to complex treatment options. In case of intra-oral cause correction of underlying problem is needed, followed by advice on use of mouthwashes, lozenges, toothpaste. Treatment modality for extra-oral cause depends upon identifying the root cause and to manage it accordingly. In the current study when inquired about management strategies for halitosis, majority of the dental students refused self-treating themselves but preferred use of traditional medications; on the other hand many of the medical students favored using self-medications to treat them by use of mouthwashes and chewing gums. This is in agreement to a study conducted by Elijah et al[26] where author stated that medical students generally work within hospitals and thus preferred use of self-medications as it's a quicker option.

Mouthwashes and chewing gums are quicker and economical approach to overcome malodour. Chewing gums have the ability to profoundly increase salivary flow rate and also elevates salivary pH, while mouthwashes also contains different active ingredients such as triclosan, chlorhexidine which are helpful in improving bad breath. Many of the respondents significantly preferred utilizing mouthwash was for cleaning mouth besides tooth brushing, as it is revealed by the results, this is consistent with the study conducted by Sharda[27] in which the author stated that about 64% of the respondents used mouthwash to further maintain oral hygiene. Majority of medical and dental candidates assured about brushing their teeth, once daily, which revealed that respondents are aware of importance of brushing their teeth once daily, this is consistent with the study conducted upon students of high school, where it was noted that many of students had habit of daily brushing their teeth[28]. Additionally it cannot be assumed that all the students were following proper brushing technique as this is beyond the scope of our study.

Halitosis no doubt can affect the self-confidence of an individual, and can hinder their ability to liberally socialize with others. The present study demonstrated that majority of dental students agreed that bad breath does have an impact on a person's social and personal lifestyle. While majority of medical students found that bad breath did not affect or influence their personal and social life, as it could be due to lack of oral hygiene awareness.

Researches conducted in past have revealed that malodour was noted to be worst on waking up in the morning[29, 30]. However no statistical association was noted in our study regarding the time when the respondents found their breath to be the worst.

Smoking is a well-known cause responsible for malodour. In the current study no statistical association was noted. Bleeding gums was a collective problem recognized by many of the medical and dental students. Periodontal disease have has been strongly associated with poor oral hygiene [31]. Accumulation of food or bacterial by-products within the periodontal pockets or within faulty or ill-fitting dental appliance all can lead to formation of bad breath.

CONCLUSION:

Results of the study point towards the fact that incidence of self-perceived bad breath among Pakistani population is within the range. Yet, these conclusions need to be further explored by means of definitive analysis to determine the exact incidence. Many Medical students are not completely aware about the possible causes for manifestation of malodour and about the different treatment approaches available. Hence it is recommended to teach basics of dentistry to medical students, which will be beneficial in long term in identifying need for interdisciplinary approach for management of bad breath which will play a key role in preventing the needless treatment opted. Moreover the role of dental professionals is important and depends on upon emphasing on different features useful to sustain good oral hygiene to the patients.

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Original Article

Evaluation Of Anxiety During Nasal Pack Removal In Patients Operated Under Local Versus General Anesthesia

Amer Sabih Hydri, Muhammad Junaid Alam, Iqbal Hussain Udaipurwala, Furqan Mirza

ABSTRACT

Objective: To evaluate the anxiety experienced before, during and after conventional paraffin gauze nasal pack removal in patients operated under local versus general anesthesia.

Study design: Comparative study.

Place and duration of study: Department of ENT, Combined Military Hospital Sialkot and PAF Hospital Shorkot from July 2017 to June 2018.

Material and methods: A total of 120 patients planned for Septoplasty were enrolled and divided into two groups. Sixty patients were to be operated under local anesthesia (Group A) while the other 60 were undergoing the same procedure under general anesthesia (Group B). Conventional paraffin gauze nasal packing was done for 24 hours in all 120 patients. Hamilton Anxiety Rating Scale (HAM-A) was used to determine the patients' anxiety in both groups, 1 hour pre-operatively, immediately before and 1 hour after nasal pack removal.

Results: The mean Hamilton Anxiety Scale assessment scores in both groups were of 'mild' category. The highest scores in both groups were observed immediately before nasal pack removal, with a range of 15-18, while the lowest scores in both groups were documented one hour after pack removal with a range of 13-16. Anxiety level in patients operated under general anesthesia was slightly lower than patients administered local anesthesia mean score of 16.40 ± 0.763 vs 17.21 ± 0.666 ($p<0.001$).

Conclusion: Anxiety during nasal pack removal is mainly associated with prior pain experienced during nasal pack insertion. It is recommended that proper analgesia, adequate topical anesthesia, gentle insertion would make this process less distressing and will subsequently result in less anxiety at its removal.

Keywords: Anxiety, Nasal Surgery, Nasal Packing, Septoplasty, Post-Operative Care

INTRODUCTION:

The earliest recorded reference to the use of nasal packing is found in the writings of Hippocrates in controlling epistaxis[1]. Nasal packing is commonly used to control bleeding following nasal surgery like septoplasty, turbinoplasty and functional endoscopic sinus surgery (FESS). An ideal nasal pack should cause minimal discomfort at insertion, exhibit a good splinting effect, control bleeding, and have minimal complications[2]. Nasal packing has some inherent disadvantages, such as causing discomfort, pain, nasal mucosal damage, septal perforation, allergic reaction, sleep/respiratory disturbances and decreased arterial oxygen saturation during sleep. Traumatic insertion of nasal packs can also result in iatrogenic bleeding[3]. Attempts have been made to produce materials that will address these problems, including removable and absorbable packing, and a multitude of nasal packing materials has emerged in recent years[4].

It is estimated that 60–80% of surgical patients experience substantial anxiety prior to surgery. Apart from pathophysiological responses such as hypertension and dysrhythmias, anxiety may also worsen the patients' perception of pain and may impede overall perioperative satisfaction[5]. Anxiety is a feeling of apprehension and fear, characterized by physical *symptoms* such as palpitations, sweating, and feelings of stress. Patient's anxiety can be measured objectively using various tests e.g., Hamilton Anxiety Rating Scale (HAM-A), State-Trait Anxiety Inventory Clinical Assessment Scale (STAI-S) and Hospital Anxiety Depression Scale (HADS). We used Hamilton Anxiety Scale (HAM-A) in our study.

It is our experience that those patients who had their nasal packing performed under Local anesthesia, having experienced the discomfort at insertion, have more anxiety because of the distressing memory, prior to their removal. On the other hand, patients who were operated under general anesthesia, being unaware of the discomfort at the time of nasal packing exhibit lesser anxiety prior to removal of the nasal packs. Search of the internet revealed a paucity of

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published literature on anxiety due to nasal packs, and none on this topic. This study was thus formulated to scientifically document and evaluate the anxiety experienced before, during and after conventional paraffin gauze nasal pack removal, using Hamilton Anxiety Scale, in patients operated under local versus general anesthesia.

PATIENTS AND METHODS:

A total of 120 adult patients of either gender, reporting to the ENT departments of Military Hospital Sialkot and Shorkot, planned for elective Septoplasty operation, were enrolled for this comparative study and divided into two groups. Sixty patients were to be operated under local anesthesia (Group A) while the other 60 were undergoing the same procedure under general anesthesia (Group B). Written consent was taken from the patients and approval of a protocol for this study was obtained from the local ethical committee. Exclusion criteria included any psychological disorder and conditions requiring other nasal surgery with septoplasty like turbinectomy/turbinoplasty. None of the patients was pre-medicated on the night prior to surgery. All patients were evaluated and reviewed by a Psychologist. The educational qualification of all patients was documented and classified as illiterate, primary school, middle, Matric and graduates. Each patient was handed over a chart containing information about what to expect in the post-operative period. All surgeries were performed by senior otolaryngologists, using the same standard operative technique. At the end of surgery, anterior nasal packing was done using conventional paraffin gauze packs and left in place for 24 hours.

Before removing the nasal packs 4% Xylocaine solution was instilled around the nasal packs for 20 minutes to facilitate their relatively painless removal. Hamilton Anxiety Rating Scale (HAM-A) was used to measure the patients' anxiety in both groups A & B, 1 hour pre-operatively ; immediately before nasal pack removal and 1 hour after removal of nasal pack. (Figure 1). The results were analysed using the student's paired t-test. A 'p value' of <0.001 was considered statistically significant.

RESULTS:

The age of 120 patients enrolled for this study ranged from 18 to 44 years with a mean of 26.3 years. The age range of 60 patients in group A was 18 to 40 years (Mean age: 25.4 years), while that of group B was 18 to 44 years (Mean age: 27.1 years). There was a total of 74 male and 46 female patients in this study (fig 2). In group A there were 38 males and 22 females (ratio of 1.72:1) while in group B there were 36 males and 24 female patients (ratio of 1.5:1). Regarding the education status of the patients, majority were primary school graduates (35%. n=42), followed by high school graduates (26.66%. n=32) (fig. 3).

The mean Hamilton Anxiety Scale assessment scores in both groups were of 'mild' category. The most common symptoms (54%) reported by patients were Somatic (muscular) and Respiratory symptoms. The highest scores in both groups were observed immediately before nasal pack removal, with a range of 15-18, while the lowest scores in both groups were documented one hour after pack removal with a range of 13-16. (table 1). Surprisingly the anxiety prior to nasal pack removal was even higher than anxiety before surgery (table 1). There was statistically significant difference among both groups recorded immediately before the nasal pack removal. Anxiety level in group B (Patients administered general anesthesia) was lower than group A (Patients administered local anesthesia) ($p<0.0001$).

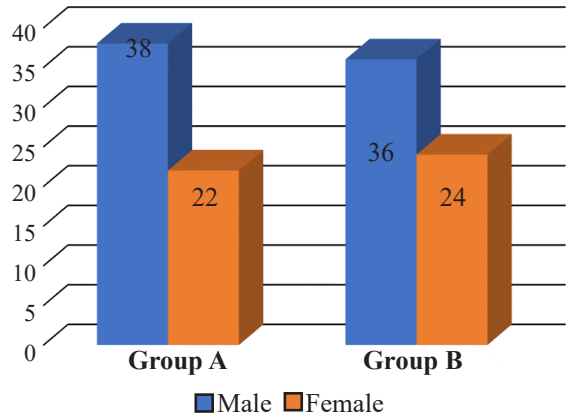

Fig. 2. Gender distribution in both groups A and B

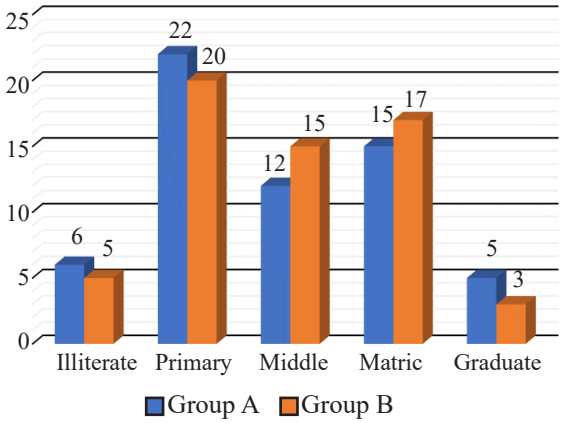

Fig 3. Educational status of patients in both groups A and B

DISCUSSION:

Septoplasty is one of the most commonly performed procedures for the treatment of deviated nasal septum[6,7,8]. Septal surgery may lead to many complications and to prevent these complications, nose is routinely packed after surgery[9,10,11]. Nasal packing is related with numerous drawbacks like uneasiness to the patient during packing and at the time of removal. In addition, it may cause headache, sinusitis, reduced sleep quality, respiratory difficulties, decreased oxygen saturation and toxic shock syndrome[12,13]. Our study is the first one to document and compare the

Hamilton Anxiety Rating Scale (HAM-A)

Classification of symptoms: 0-absent; 1-mild; 2-moderate; 3-Severe; 4-Incapacitating.
HAM-A score level of anxiety: <17mild; 18-24 mild to moderate; 25-30 moderate to severe

Symptoms Date:_____

1. Anxious mood 0 1 2 3 4
   - Worries
   - Anticipates worst
2. Tension 0 1 2 3 4
   - Startles
   - Cries easily
   - Restless
   - Trembling
3. Fears 0 1 2 3 4
   - Fear of the dark
   - Fear of strangers
   - Fear of being alone
   - Fear of animal
4. Insomnia
   - Difficulty falling asleep or staying asleep
   - Difficulty with nightmares
5. Intellectual
   - Poor concentration
   - Memory impairment
6. Depressed Mood
   - Decreased interest in activities
   - Anhedonia
   - Insomnia
7. Somatic complaints – Muscular
   - Muscle aches or pains
   - Bruxism
8. Somatic complaints – Muscular
   - Tinnitus
   - Blurred vision
9. Cardiovascular Symptoms
   - Tachycardia
   - Palpitation
   - Chest pain
   - Sensory of feeling faint
10. Respiratory Symptoms
    - Chest pressure
    - Choking sensation
    - Shortness of breath
11. Gastrointestinal Symptoms
    - Dysphagia
    - Nausea of vomiting
    - Constipation
    - Weight loss
12. Genitourinary Symptoms
    - Urinary frequency or urgency
    - Dysmenorrhea
    - Impotence
13. Autonomic Symptoms
    - Dry mouth
    - Flashing
    - Pallor
    - Sweating
14. Behavior at Interview
    - Fidgets
    - Tremor
    - Paces

TOTAL SCORE: _____

Fig. 1. Hamilton Anxiety Rating Scale

	1hour pre-operatively			Immediately before pack removal			1 hour after pack removal		
	Range	**Mean**	**St. deviation**	**Range**	**Mean**	**St. deviation**	**Range**	**Mean**	**St. deviation**
Group A	14-16	15.30	0.720	15-18	17.21	0.666	13-16	14.40	0.994
Group B	14-16	15.35	0.732	15-18	16.40	0.763	13-16	14.26	0.936

Table 1 Hamilton Anxiety Rating Scale Scores in Both Groups A and B

anxiety experienced prior to conventional paraffin gauze nasal pack removal in patients operated under local versus general anesthesia.

We performed septoplasty in this study and the pack was removed after 24 hours in all the patients. Hamilton Anxiety Rating Scale (HAM-A) was used for recording anxiety level. It was introduced by Max Hamilton in 1959 to measure both psychic and somatic anxiety levels in patients objectively. The score consists of 14 items, each defined by a series of symptoms. Each item is scored on a scale of 0 to 4 (not present, mild, moderate, severe and incapacitating), with a total score range of 0 to 56. A score of 17 or less indicates mild anxiety, 18 to 24 indicates mild to moderate anxiety while a score of 25 to 30 indicates moderate to severe anxiety.

Sahin in his study concluded that State/Trait Anxiety Inventory, (STAI) anxiety levels did not decrease significantly after operation, but only after removal of nasal packs[14]. This is commensurate with our findings where the Hamilton

anxiety index score before pack removal was even higher than before surgery. A study by Hosemaan about anxiety levels in patients undergoing endoscopic sinus surgery observed that patients with information about the surgery and especially female patients had a significantly higher level of pre-operative anxiety[15]. Rozanska-Kudelska in his study showed no significant difference in patient anxiety before and after endoscopic sinus surgery and septum surgery[16] while Muluk claims anxiety levels of patients having endoscopic sinus surgery decreased after the operation[17]. Education of the patient may alter the perception of pain and anxiety. Increased awareness about the procedure and peri-operative period may either lessen or sometime increase the anxiety of the individual. There are studies revealing education level may enhance anxiety[18].

Sahin noted a statistically significant increase in patients' anxiety before pack removal[14] which is fairly similar and commensurate with our findings. In another study designed to alleviate patients' anxiety, Sahin and Aras[19] used lidocaine infiltration into nasal packing 15 minutes prior to removal but their study showed a higher Hospital Anxiety and depression score (HADS), even in the saline group. In one study Dutta et al[20] evaluated pain while nasal packing, where pain was moderate in locally anesthetized nasal cavities compared to severe pain in those case where no local anesthesia was used. This corroborates our hypothesis that patients who have had nasal packing done under local anesthesia will be potentially more apprehensive regarding pack removal pain or discomfort. A study by Hosemaan revealed that the preoperative anxiety of the patient also increased on the information received from friends/ relatives or other patients. In contrast another study by Muluk using HADS claims that a patient well-informed about the nasal packing and hospital conditions will not exhibit exaggerated anxiety or depression. This substantiates our findings, as all patients were handed over charts containing information about what to expect in the post-operative period and most if not, all exhibited variable mild anxiety.

The period of nasal packing after nasal surgery is also a crucial factor for pain and anxiety in the patients[21]. There is no absolute consensus about the duration of nasal packing, however most ENT surgeons leave it for at least 24 to 48 hours[22], but now numerous surgeons favour nasal packing only for 24 hours[23]. In our study we removed the pack after 24 hours in all patients and re-packing because of bleeding was not required in any case. Removal of nasal pack is described by many patients as the most painful and excruciating experience of their life[24]. To reduce this problem many absorbable materials have been tried by surgeons, but apprehensions have been stated regarding bio-compatibility and cost effectiveness[25].

CONCLUSION:

Patients who remembered their nasal packing being performed under local anesthesia exhibited more anxiety before nasal pack removal compared to those who had nasal packing done under general anesthesia. It is recommended that proper analgesia, adequate topical anesthesia, gentle insertion would make this process less distressing and subsequently result in reduced anxiety at their removal.

Conflict of interest:

The authors claim no conflict of interest or any financial funding

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Original Article

Life Style Practices And Health Risk Behaviors Of Medical Students: A Cross Sectional Study

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ABSTRACT

Objective: A health risk behavior like physical inactivity, unhealthy diet, tobacco use, drug abuse, unprotected sexual practices or harmful use of alcohol is linked with serious ailments like liver cirrhosis, hypertension, abnormal lipid profile and number of cardiovascular diseases. Our study is aimed to explore perception of students about health risk behaviors; eating routines, life style and stress handling practices and compare amongst medical students of first and second year.

Subjects and Methods*:* In this cross-sectional study, 233 female students between 1 8–25 years of age, from first two years of medical college were administered a self-structured questionnaire Response of each item was rated on five-point Likert scale. Maximum points in the scale were five and the minimum was one for each item. Mean score was obtained by adding points of all responses. Degree of health awareness was categorized into low, medium and high on the basis of mean cumulative scores. Independent sample t test was used to compare means between study groups based on academic level (Year I and II medical students)

Results: The overall results of the study revealed positive health behaviors among medical students. Year I MBBS had superior acquaintance on healthy eating routines (p-value = 0.001), lifestyle patterns (p-value = 0.002), and stress handling practices (p-value < 0.001) as compared to senior class. Tendency to have anxiety attacks was more in 1st year students (p-value=0.002) while capability to withstand stress was better in senior class (p-value=0.004).

Conclusion: Majority of medical students practiced positive health behaviors. These attitudes in terms of selection of life style choices; healthy food and physical activity with avoidance of health risk behaviors and supportive practices was better in Year I students.

Key words: Health risk behaviors, nutrition, physical activity, stress, medical students

INTRODUCTION:

Global burden of non-communicable diseases like cardiovascular disorders, diabetes and infectious diseases is increasing[1]. Poor health leads to increased morbidity and mortality that is attributed to insufficient health knowledge among the population[2]. Health related behaviors are categorized into risk behaviors and positive health behavior[3]. "Health risk" is de?ned as "a factor that raises the probability of adverse health outcomes"[4]. A health risk behavior is therefore any activity that increases the risk of disease or injury maythis be physical inactivity, unhealthy diet, tobacco use, drug abuse, unprotected sexual practices or harmful use of alcohol. These behaviors are linked with serious ailments like liver cirrhosis hypertension, abnormal lipid profile and number of cardiovascular diseases[5].

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Positive health behavior is an action taken by a person to maintain good health and prevent illness. This includes intake of healthy food, safe practices and participation in physical activity.

The practice of unhealthy life style (junk food, soft drinks and physical inactivity) has led to an increased prevalence of obesity is Pakistan, with an inherent risk of developing chronic diseases in near future[6]. Health awareness is hence a must to equip individuals with bear minimum knowledge on issues related to physical as well as mental well being. Risk factors for the development of serious chronic diseases in later life can be altered by adaptation of healthy lifestyle, behavior or health hazards during adolescence and young adulthood[7].

The aim of medical institutions is to educate and train future doctors, hence provision of the awareness and effective public healthcare strategies, including curing and caring among societies is pivotal in medical education[8]. American College of Health Association also encourages the educational institutes to bring awareness among their students for improving quality of life and avoid unhealthy practices to reduce risk for debilitating diseases in future. Delivering knowledge about health amongst medical students is essential because in addition to requiring it for themselves, as future

physicians they shall promote health awareness and wellness amongst societies[8].

The psychological stress of educational institutions may lead to harmful consequences like decreased life satisfaction, depressive moods, poor academic performance, diminished empathy and reduced competence skills. Literature suggests that those medical students who do not adopt healthy lifestyle, fails to provide effective health care to community in future as well[9].

Therefore, there was a need to study the prevalence on health awareness in medical college students to explore the current status of their health practices. We planned this study to explore the eating habits, lifestyle pattern and stress coping strategies of year-I and year II undergraduate students. Based on these findings, activities could be created within the curriculum to enhance opportunities to increase their health awareness to embark positive effects on their future.

SUBJECTS AND METHODS:

This cross-sectional study was conducted at "The Medical and Dental College,University of Faisalabad" from March to December 2016. Sample size was 240, figured at a power of 80% and á at 0.05[9]. 240 students of Year I and Year II were included by convenient sampling technique, out of which 233 students completed the Performa. As this is a female medical college, the entire participant represented single gender. Those students who did not consent to take part in the study were excluded. Prior to data acquaintance, approval was sought from institutional ethical review board (UMDC/Dean/008/82)and informed consent was taken from each participant. Data was collected via self-structured questionnaire tailored on the basis of literature review[9-13]. Questionnaire comprised of questions on eating habits, lifestyle patterns and stress handling practices. The questionnaire was pretested and verified for error on a set of 50 students. Internal consistency and reliability of test items was determined by Cronbach's alpha coefficient, which was 0.91[12]. Reverse scoring was done for negative questions such as feeling of hopelessness and attacks of frequent anxiety. Responses were rated on five-point Likert scale. Maximum five points and Minimum one point were allocated for each item and cumulative mean scores were obtained by summing the points of all responses[11,12].

The mean rules were used to determine health awareness. Degree of awareness was categorized into low, medium and high depending upon the mean cumulative scores for the purpose of comparison between two study groups. Cutoff points for degree of awareness was taken from previous literature[11,12]. Data analysis was done by statistical package for social sciences (SPSS) version 21. Descriptive analysis was performed to obtain means of demographic variables. Independent sample t test was used to compare means between study group with p value <0.05 considered as significant.

RESULTS:

Total number 109 Year-I students and 124 year-II students completely filled the questionnaire. The mean age of participants was20.03 ±1.04 years while the mean body mass Index (BMI) was found to be 22.27 ± 4.36 kg/m^2. There was no significant difference in BMI of first and second year students 21.88 ± 4.83 and 22.62 ± 3.90 kg/m^2 respectively. Majority of the students belonged to good socioeconomic status. Income of parents of 47.6% of students was higher than 100,000 Pakistani rupees, 47.2% between 50,000 to 100,000 and rest having less than Rs. 50,000. Students with 4-6 family members and 6-8 family members were 63.5% and 22.3% respectively. Rest of them either had less than four or more than ten family members.

Majority of the students from both classes showed healthy life style practices although there were some domains in which significant difference was observed. Table1 summarizes the healthy eating routine and healthy practicing among the students. Year I students were particular about intake of water and avoiding salt intake (P< 001). Both groups had low scores on excessive fast food intake and soft drinks consumption. However, year II students practiced exhibited consumption of soft drinks more than Year I students (p =0.006).

Table 2 represents the stress coping practices in our participants. Year I students were contributing their time and expenses for the community and were more optimistic and hopeful than Year II students (p<0.0001).On the contrary, Year II students had greater ability to overcome their stress and anxiety than their junior class (p<0.004.Table 3 shows cumulative scores for all the three domains eating habits, lifestyle patterns and stress handling with significantly better practices among students of Year I.

DISCUSSION:

Sustained performance of students lies in their health; both physical as well as mental. Therefore, it is essential to establish healthy environment in institutes and encourage the students to adopt healthy behavior. Efforts to improve the life style reside within awareness about the nutrition, physical activity, healthy environment like cleanliness and greenery and work places ethics. As the health awareness is critical for not only their own wellbeing but the society in general[14], it was interesting to find out that year-1 students had an overall better score in comparison to their seniors in all the three categories.

Healthy diets and consistent physical activity are major factors in the campaign of good health through the life time. Fat accumulates once and only calories consumed by food and drinks surpass that which can be compensated by an individual's breakdown and physical activity[15]. Sedentary life styles, availability of fast food at door steps, eating while watching television, enrichment of mobile and video games, and decrease in outdoor activity are health risk behaviors

Healthy diet and lifestyle Patterns	Mean ± SD		P value
	Year I MBBS	Year II MBBS	
Breakfast is an important part of my daily life	3.13 ± 1.32	3.12 ± 1.40	0.930
Fruits are part of my diet at least five times a week	3.78 ± 1.02	3.50 ± 1.14	0.132
I avoid eating too much animal fat	3.4 ± 0.92	4.07 ± 1.19	0.010*
I try to keep my body weight within normal range	3.70 ± 0.95	3.65 ± 1.07	0.599
I maintain water intake of around six to eight glasses	4.00 ± 1.18	3.00 ± 1.21	0.000*
I take fast food for at least three times a week	2.13 ± 0.91	2.35 ± 1.06	0.097
I consume more than five soft drinks per week	2.4 ± 1.08	2.75 ± 1.37	0.006*
I do exercise daily	3.23 ± 1.03	2.83 ± 1.19	0.007*
I sleep of seven to eight hours	3.26 ± 1.24	3.49 ± 1.31	0.181
I brush my teeth regularly	3.84 ± 1.33	4.61 ± 0.70	0.000*
I wear a seatbelt and drive limited speed while travelling in a car	4.08 ± 1.16	2.33 ± 1.19	0.000*
I try to maintain healthy environment in my house	3.62 ± 0 .94	3.62 ± 1.00	0.996

The mean rules were used to determine health awareness: high score as five, medium as three and minimum as one for each item. Values are summed and represented as mean ± Standard deviation. Independent t test was used to compare the results

Table 1: Lifestyle practices among medical students

Healthy diet and lifestyle Patterns	Mean ± SD		P value
	Year I MBBS	Year II MBBS	
I make deliberate effort to control or avoid stress	3.50 ± 0.84	3.41 ± 1.09	0.51
I try to support my friends in their time of stresses	4.23 ± .731	4.17 ± 0.66	0.50
Most of the time, I fell optimistic and hopeful	4.09 ± 1.14	3.15 ± 0.93	0.049*
I often feel helpless in dealing with the problems in my life	1.89 ± 0.94	1.99 ± 1.02	0.47
I suffer frequent mood swings and attacks of anxiety	2.24 ± 1.09	2.46 ± 1.07	0.112
I experience anxiety attacks especially before exams	2.71 ± 1.20	2.23 ± 1.13	0.002*
I am capable of overcoming my stresses	3.40 ± 1.31	4.0 ± 1.04	0.004*
I often seek help from my friends in emotional stresses	3.04 ± 1.19	3.30 ± 1.05	0.496
At times I have to take help from parents and family members	3.28 ± 1.08	3.00 ± 1.29	0.58
I have to visit a psychiatrist to seek help	3.62 ± 1.06	3.77 ± 1.16	0.319

The mean rules were used to determine health awareness: high score as five, medium as three and minimum as one for each item. Values are summed and represented as mean ± Standard deviation.
Independent t test was used to compare the results

Table 2: Stress handling Practices

	Mean ± SD		P value
	Year I MBBS	Year II MBBS	
Healthy eating routines	33.58 ± 4.20	31.61 ± 5.2	0.001*
Lifestyle Patterns	41.00 ± 5.20	39.30 ± 6.1	0.002*
Stress handling Practices	56.27 ± 5.46	53.21 ± 6.5	0.000*

Independent t test was used to compare the results
P value< 0.05 is less than significant

Table 3: Comparison of cumulative scores of eating habits, lifestyle patterns and stress handling between Year I and II MBBS students

which attribute to ill health[16]. Group study is a common practice among medical students during which trends of consuming snacks, drinks, and avoidance of balance diet is increasing continuously in them[17,18]. Year I students were used to take healthy diet as compared to their seniors which may be linked with the above explanation.

Healthy behaviors were practiced by majority of medical students. A previous study is in agreement with our study where medium level of health practices were noticed among students[11]. However, study conducted at the University in Jordon[12] was incongruent, as they found lower health acquaintance among their university students.

In this study, first year MBBS student scored better for overall healthy behavior than Year II medical students. It seems that juniors are more conscious and careful about their health. A previous study has reported similar results[12]. However a past study found a higher score for 2nd year than first year female students of Jordanian colleges[18]. Further studies in future should be conducted to evaluate the health awareness among the teachers of schools, colleges and universities level, as the teachers are role models and facilitators for their students. Teacher's awareness has greater impact on their students suggesting needs to focus on collective health awareness of all the caders across university.

Results of our study reveal that overall awareness of health risk behaviors among medical students was satisfactory as it ranged between medium to high level. Majority of Year I students reported the use of seat belts while driving yet this practice was reported quite low in the year II students. Similarly Year I students were found to be engaged in regular physical activity as compared to Year II students. This reiterates the fact that extensive educational workload does seem to impact on healthy practices and therefore, the institutions should arrange avenues within their academic year to promote healthy activities. Therefore health-promoting programs in such institutes make students responsible not only for their own healthy lifestyle, but for the health of their families and society

Positive health behaviors besides intake of healthy diet and participation in physical activity comprise of effective interpersonal relationship, involvement in social events and spiritual activities which in turn help to withstand stress[19]. Regarding copping with stressful situation, students reported a better awareness in terms of their supportive practices. Both the years scored well while Year I slightly scoring higher than their seniors in this regards as well. As far as stress coping strategies are concerned, the students of senior class reported a better score and were confident that they were able to control their stresses. This might be due to the fact that they are more settled in their environment, well versed with the curriculum as has been reported in the literature[21]. As Year I students are new recruits, they face challenges hooked to a change in learning environment and competing pattern of studies that turn out to be stressors and time and acclimatization is required cope up with these conditions[20]. Other studies also report similar differences in practices of healthy behaviors among the students of various academic levels of their university with respect to supportive, dietary and healthy practices[10].

Our study was limited by the fact that it was conducted only at one medical institution that comprised of female students only As we aimed to study students at other institutions in near future, we intend to compile this to understand the broader picture of current status of our students' understanding in this very critical aspect. We suggest that health awareness programs especially nutritional education should be arranged on a broader scale including students of schools to colleges to university levels for promotion of healthy eating habits and lifestyles for uplifting the health status of our society[21]. This awareness may increase one's effort to prevent diseases beforehand and to adopt a lifestyle that promotes individual health as well as of the society.

CONCLUSION:

Majority of medical students practiced positive health behaviors. These attitudes in terms of selection of life style choices; healthy food and physical activity with avoidance of health risk behaviors and supportive practices was better in Year I students.

This underlines the need of health awareness seminars on academic forum, counseling sessions, workshops on stress relaxation and time management and enhancement of outdoor recreational activities in all medical universities for all academic years.

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Original Article

To Evaluate The Self-Apprehension Of Dental Students About Their Own Smile Aesthetics

Farzana Memon, Salwa Memon, Muhammad Muslim Khahro, Abdul Salam Memon

ABSTRACT:

Objective: This cross-sectional observational study was accomplished at Isra University to evaluate the self-apprehension of dental students related to their own smile.

Material and Methods: This study was comprised of 166 dental students belonging to both genders. A structured self-administered questionnaire was used to conduct a survey among undergraduate dental students at all study levels in Isra University. Questionnaire was designed to observe the self-apprehension and satisfaction of students with reference to their dental appearance.

Data analysis was done using descriptive statistics via 21st version of SPSS. 0.05% was established as the level of significance.

Results: 166 students (32 males and 134 females) participated in this survey. 32.5% students were shy as against 91.6% students who were bold at smiling in public. 55.4% students preferred to be photographed from side pose while 69.9% were inspired by other's smile.

In terms of teeth dimensions, 60.2%, 54.8% and 46.4% students were gratified with the length, breadth and form of their teeth respectively.

Conclusion: This study concludes that greater number of dental student were self-assured regarding their apprehension on their own dental appearance. Majority of the females though contented with the dimensions and contour of their teeth, urged to have lighter teeth.

Key words: Self-apprehension, dental appearance, smile, dental students.

INTRODUCTION:

When we think of beauty, the immediate thought which strikes our mind is the face. The reason being for that is the face has a very important and attractive attribute called smile next to the eyes[1,2]; their significance indicated through studies as 31% and 34% respectively[3-6].

As for now, dental aesthetics have become a necessity as there are people who are lacking self-assurance and becoming reserved as a consequence of not having a pleasant appearance[7,8].

Smile as we know and as discussed earlier is very crucial and thus many patients visit the dentists nowadays for orthodontic treatment and aesthetic restorations[9-11]. In recent times, significant dental aesthetics is consequential in creating pleasant and decent appearance, which in turn helps the patient regain their lost confidence[12].

Media these days with advertisements and endorsements of beauty creams and tooth pastes manipulate the society and force them to become a physically well-being individual and so the fundamental objective of aesthetic dentistry is to make people look attractive by making their smile attractive. This explains why the demand of aesthetic dentistry has excelled in today's generation.

Aesthetic dentistry is recognized to create a satisfying smile in order to make people appear beautiful. In order to fulfil this task, the dentist must make a treatment plan based on the requirements of dental management and patient's aesthetic concerns.

Concept of smile aesthetics between a lay man and a dentist definitely differs. In a study[13] conducted in the year 2016, Saffarpour A et al proved that difference in smile insight between these two is negligible and on the other hand, Tortopidis D[14] remarked that the patient's expectations related to dental aesthetics are higher and un-realistic as compared to dentists. Few of the patients desire extensive aesthetic corrections regarding tooth form, colour and tooth position but dentists however, are more receptive to colour, contour and mastication of teeth[15].

Dental Education imparts a great effect on the correct

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understanding and awareness of the basic concepts of dental aesthetics thus improving their own aesthetic apprehension. Though gaining much knowledge regarding aesthetics may cause the dental students discontented with their smile as they gain more and more awareness regarding smile aesthetic fundamentals which might go unnoticeable if looked otherwise, yet it might prevent the students from indulging into unrealistic desires leading to false look. Hence, the aim of this study is to appraise the self-concept of undergraduate dental students regarding their smile in terms of gratification.

MATERIAL AND METHODS:

This cross sectional observational study was executed on undergraduate dental students at Isra University to evaluate their self-apprehension regarding their own dental appearance. After getting consent from ethical committee and study participants a self-structured questionnaire was used to conduct a survey among undergraduate dental students. Of 210 total students, 166 (134 females and 32 males) agreed to participate in the study and filled the question form.

The survey form was divided into three set of questions, the first set of questions enclosed polar questions that interrogated about confidence at smiling in public places, contentment with the colour and contour of their teeth and gums and whether the participants esteemed someone's smile in public or media.

The other set of questions enquired regarding gratification with the dimensions of teeth, proportion of teeth to gums and incisal display.

The third set of questions encompassed a visual analogue scale (0-10), where score 0 was measured as least satisfied while score 10 reflected as most satisfied. Students used this scale to rank their level of contentment with the colour of their teeth, smile in photographs and how much their occupation has motivated their oral health.

Data analysis was done using descriptive statistics such as percentage, cross tabulation etc. via 21st version of SPSS. 0.5% was established as the level of significance.

RESULTS:

79.05% (166/210) students responded to the study and completed the survey form. Figure 1 shows the male to female ratio in the participants and Table 1 illustrates the age range and mean age of the students participated in the study. Table 2 reveals that 91.6% respondents were assertive while smiling public. Conversely 32.5% were shy to show their teeth while smiling at public places. 55.4% students felt that their side pose looked better from front pose in photographs. 56.6% students preferred to have a celebrity like smile. 77.7%, 87.3% and 24.7% students were not satisfied with their tooth colour, contour and gums respectively.

Moreover, when they were inquired about gratification related to incisal display, proportion of gums visible and dimensions of teeth, only 7.8% and 8.4% participants were appeased with the incisal display and gum show at smiling respectively (Table 3 and 4). 60.2% and 54.8% applicants were happy with the length and breadth of their teeth respectively. (Table 5 and 6)

Table 7 shows that only 46.4% candidates were pleased with the form of their teeth. Table 8 shows the mean and median of 4 questions that candidates were asked to record answers using a numeric scale from 0 to 10. Applicants contented with their teeth colour counted 16.9% only and 32.5% were completely satisfied with their smile in photographs (scored 10). The students responded unevenly on how much dental education motivated their oral health behaviour, 31.9% individuals observed that dental education has exerted 100% inspiration on their oral hygiene performance.

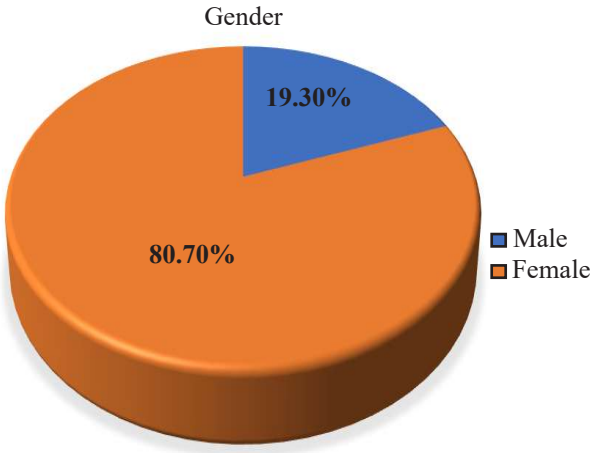

Fig 1: Gender distribution

Age	
Minimum	16
Maximum	26
Mean	20.44
Std. Deviation	1.523

Table 1: Age distribution

DISCUSSION:

This survey was conducted to validate the self-concept of undergraduate dental students at Isra University, related to their own smile and dental appearance.

Multiple factors including age, gender, social circle, socioeconomic factors and media influence the individual's insights concerning their smile and dental appearance in a number of ways[16,17]. Therefore, to monitor the selfapprehension of a community is a great challenge.

Our analysis presented that, 91.6% candidates were happy with their smile while smiling in open while 69.9% individuals preferred other's smile at their owns. Similarly, in a survey carried out by Azodo CC et al[18]; more than three-

Questions	Yes		No		Total	
Gender	Male	Female	Male	Female	Yes	No
Do you feel confident while smiling?	28 (18.4%)	124 (81.6%)	4 (28.6%)	10 (71.4%)	152 (91.6%)	14 (8.4%)
Do you cover your mouth with your hand while smiling?	2 (3.7%)	52 (96.3%)	30 (26.8%)	82 (73.2%)	54 (32.5%)	112 (67.5%)
Do you feel that your face's side pose looks better in photograph?	19 (20.7%)	73 (79.3%)	13 (17.6%)	61 (82.4%)	92 (55.4%)	74 (44.6%)
Do you think someone has a better smile than yours?	24 (20.7%)	92 (79.3%)	8 (16.0%)	42 (84.0%)	116 (69.9%)	50 (30.1%)
Are your eyes drawn to the model's smile, when you read a fashion magazine?	13 (13.8%)	81 (86.2%)	19 (26.4%)	53 (73.6%)	94 (56.6%)	72 (43.4%)
Do you feel any defects in your teeth or gums, when you look at your smile in the mirror?	17 (14.0%)	105 (86.0%)	15 (34.9%)	29 (65.1%)	122 (73.5%)	44 (26.5%)
Do you desire to have whiter teeth?	21 (19.8%)	85 (80.2%)	11 (18.3%)	49 (81.7%)	106 (63.9%)	60 (36.1%)
Are you satisfied with the way your gums look?	26 (20.2%)	103 (79.8%)	6 (16.2%)	31 (83.8%)	129 (77.7%)	37 (22.3%)
Do you like the shape of your teeth?	22 (17.6%)	103 (82.4%)	10 (24.4%)	31 (75.6%)	125 (75.3%)	41 (24.7%)
Do you idealize any model's smile in magazines and desire to have a smile as pretty as theirs?	30 (20.7%)	115 (79.3%)	2 (9.5%)	19 (90.5%)	145 (87.3%)	21 (12.7%)

Table 2: Results of the combined questions concerning the satisfaction with the own teeth and smile

Teeth visible at smiling?	Male	Female	Total
Too many	12	52	64 (38.6%)
Too few	18	71	89 (53.6%)
Normal	2	11	13 (7.8%)

Table 3: Self-perception of students regarding teeth visible during smiling

Gums visible at smiling?	Male	Female	Total
Too much	8	16	24 (14.5%)
Too little	23	105	128 (77.1%)
Normal	1	13	14 (8.4%)

Table 4: Self-perception of students regarding gums visible while smiling

Do you think teeth too long or too short?	Male	Female	Total
Too long	4	30	34 (20.5%)
Too short	6	26	32 (19.3%)
Normal	22	78	100 (60.2%)

Table 5: Self-perception of students concerning teeth length during smiling

Do you think teeth too wide or too narrow?	Male	Female	Total
Too long	8	39	47 (28.3%)
Too short	4	24	28 (16.9%)
Normal	20	71	91 (54.8%)

Table 6: Self-perception of students concerning teeth width during smiling

Do you think teeth too square or too round?	Male	Female	Total
Too long	11	61	72 (43.4%)
Too short	7	10	17 (10.2%)
Normal	14	63	77 (46.4%)

Table 7: Self-perception of students concerning teeth shape during smiling

Score (0-10)	Mean	Median
Gratification concerning your teeth colour?	7.52	8.00
Level of gratification related to your smile in photographs?	7.92	8.00
How much your occupation has motivated your oral hygiene?	8.40	9.00

Table 8: Mean and median of dental student's self-perception regarding scored questions

quarters (79.4%) were appeased with their dental look.

Whereas Silva GDCD et al [7], revealed in his study done at Brazilian students that 92% of them were gratified with their smile while 90% admired other people's smile. The reason behind this is that nowadays mass media is playing a great role in bringing smile beauty standards forward, which is mostly effecting the females and teenagers. Majority of the people thus seeking orthodontic treatment for aesthetic reasons are usually females and teenagers or young adults.[19]

A study [7] conducted in the year 2012 had similar findings as ours that showed though females were more pleased with their smile then males yet they admired to have a better and a superstar like smile. Conversely, few more studies [17, 20, 21] showed that females tends to be more unhappy with their smiles as compared to males. In another study [22] male and female participants had equal gratification level regarding tooth colour, whereas in terms of occlusion and teeth dimensions females were less contented as compared to males.

It's generally observed that females are more beauty conscious whether it is aesthetic implications of missing teeth [23] or any scar resulting from some physical injury [24].

The findings of our study showed that 77.7% individuals desired to have lighter teeth. The findings of Tortopidis D et al[14] and Thiyagarajan A et al[25], were consistent with our study while the findings of Carlsson et al[26] contradicted our study and found that non dental students urged to have lighter teeth as compared to dentists.

The traditional sensation of tooth whitening has already flourished in many countries. In US, 34% of total population is unhappy with their tooth colour.[27] In fact, current tradition dictates not only the demand for a healthy mouth but a perfect smile as well[28].

Our study revealed that 87.3% respondents were gratified with their tooth form which was consistent with the study[7] conducted in the year 2012. Additional studies must be conducted in this area keeping in mind the needs and difficulties, professionals face while planning an aesthetic treatment.

CONCLUSION:

Within the limitations of this study, it is concluded that majority of the dental students were gratified with their self-apprehension related to their own smile and dental look. Females though more satisfied with the form and dimensions of the teeth, desired to have even better smile in terms of tooth colour because they are more beauty conscious and they easily and readily get touched and inspired by other's smile.

Dental Students have more knowledge of dental aesthetics as compared to a lay man and as the year of study progresses, their knowledge related to smile aesthetic increases. Hence, dental education and awareness has positive attitude on or oral hygiene behaviour. It is also very important for the practitioners to understand the patient's self-concept of their own smile and dental appearance because lack of communication between them can lead to patient discontentment even if the treatment planned and executed according to ideal smile aesthetic standards.

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Original Article

To Determine The Frequency Of Vitamin D Deficiency In Patients With Chronic Hepatitis C

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ABSTRACT

Objective: To determine the frequency of vitamin D deficiency in patients with chronic hepatitis C (CHC)

Design: It was a Descriptive and Cross Sectional study

Place and Duration of Study: It was carried out in the Medicine Unit of Pakistan Naval Ship SHIFA, Karachi from Nov 29, 2016 to May 29, 2017.

Patients and Methods: Approval was sought from Institutional Review Board before carrying out the study. Proper history, clinical examination and appropriate lab investigations were carried out. Standard techniques were used for blood sample collection. Site used for blood collection was antecubital fossa. Sterile method was used for fasting sample and about 10 ml of blood was collected from each patient.

Results: A total of 289 patients were included. Strict exclusion and inclusion criteria was used for study cohort. Mean age (years) of study cohort was 34.51+8.32. There were 188 (65.1) male and 101 (34.9) female patients. Patients with CHC who were vitamin D deficient were 74 (25.6).

Conclusion: Patients of CHC had high frequency of vitamin D deficiency which suggests that further studies in the region will be conduct in our general population to know the exact statistics which will pave the way for future researchers

Keywords: Chronic Hepatitis C, Vitamin D deficiency, Liver Cirrhosis.

INTRODUCTION:

Hepatitis C infection is caused by hepatitis C virus (HCV), an RNA virus. It is an infectious disease and liver is the main target of this virus. Around 70% of the infected become chronic carrier. The most feared complication of hepatitis C infection is cirrhosis, which may take 10 to 20 years to develop, and affect about 30 % of patients with CHC[1]. Complications of hepatic cirrhosis include jaundice, ascites, encephalopathy, gastro intestinal bleeding, gastric varices and bleeding profile disturbances. Hepatitis C infection is prevalent all over the world with highest burden in developing countries. It is a rising reason of mortality and morbidity due to the disease especially in low income countries[2].

Vitamin D has multiple functions in the body. It is an important vitamin soluble in fat. Its central role is to increase the absorption of micronutrients from the gut like calcium, phosphate, zinc and magnesium. Many steps occur in the synthesis of vitamin D and each step is mediated by specific enzyme. In the liver the inactive form of vitamin D is hydroxylated to its major form, the 25-hydroxyvitamin D [25(OH) D]. This is a measure of body vitamin D level[3]. Further conversion of 25(OH) D to 1, 25-dihydroxyvitamin D [1, 25(OH) D] occur in kidney and enzyme required for this reaction 1-alpha-hydroxylase. [1, 25(OH) D] formation mostly occur in the kidneys but the same vitamin is also formed in many other extra renal organs[4]. Vitamin receptors which are manifested in various organs are activated resulting in its action. Regulation of almost 3% of the human genome is done by active vitamin D. Its role is not only in micronutrients homeostasis but has also been recognized as a vital physiological regulator with pleiotropic functions[5]. In addition to bone diseases vitamin D insufficiency has been associated with a higher incidence of cancer[6], cardiovascular[7], infectious diseases like hepatitis C and autoimmune disorders[8, 9]. Sun exposure is important for optimum vitamin D level. Though in Pakistan sun exposure is almost optimal but still vitamin D deficiency is most prevalent in this part of the world, which may be due to so many reason[10]. Many studies highlighted that patients with Chronic Hepatitis C have concomitant vitamin D deficiency[11]. However there is a significant variation regarding it's frequency in CHC patients, varying from 4% to 92%[12]. Furthermore there is a controversy in classifying serum vitamin D levels as different upper and lower limits values were employed in different studies[8].

Our study results will clarify the above variation in our target population and find out the frequency of vitamin D deficiency in our CHC cohort. The controversy in classifying circulating vitamin D levels will be addressed by using lower limit of 30 ng/ml of serum vitamin D, as mentioned

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is some studies[8]. Our study will set a baseline data for our general population for frequency of vitamin D deficiency in patients with chronic hepatitis C. Results of our study will pave the way for future researchers to plan more research on this topic.

PATIENTS AND METHODS:

This Descriptive and Cross Sectional study was conducted in the Medicine Unit of Pakistan Naval Ship SHIFA, Karachi, from Nov 29, 2016 to May 29, 2017. Sample size (n) of 289 was calculated with the help of World Health Organization sample size calculator. Confidence level was kept at 95%. Anticipated population proportion (P) was taken as 25% and absolute precision required (d) was kept at 5%. Consecutive non-probability sampling technique was used for sampling. A cut of value of serum 25(OH) D less than 30ng/ml was considered as a vitamin D deficiency (confirmed on laboratory investigations employing radioimmunoassay).

Patients of either gender with age 20-50yrs and Anti HCV positive patients (on laboratory investigation) at least of 6 months duration (on history and hospital record) and quantitative PCR detected for HCV RNA (on laboratory investigation) were included in the study. Already diagnosed cases of vitamin D deficiency (based on history and medical record), those under treatment of vitamin D deficiency (based on history and medical record), patients already on antiviral therapy (on history and medical record) and patients with concurrently Hep B sAg positive were excluded from the study.

Approval was sought from Institutional Review Board before carrying out the study. After proper history, clinical examination and lab investigations patients' written informed consent was documented. All data was anonymized to ensure confidentiality. Standard techniques were used for blood sample collection. Site used for blood collection was antecubital fossa. Sterile method was used for fasting sample and about 10 ml of blood was collected from each patient. It was immediately transferred to a clean container with cap and sent to laboratory for analysis. All the specimen collections was done by 4th year resident student. Data was recorded for vitamin D deficiency as per operational definition and noted on especially designed proforma (attached with).

For data analysis SPPS version 20 was used. For descriptive analyses like age, we calculated standard deviation and mean. For qualitative variables like gender and vitamin D deficiency in CHC, frequency and percentages were calculated.

Confounders were controlled in analysis by stratification of data with regards to gender and age. After stratification, a Chi square test was used and p value = 0.05 was taken as significant.

RESULTS:

Total number of 289 patients was included in the study. Mean age (years) was 34.51+8.32 with ranges from 20 to 50 years. There were 188 (65.1) male and 101 (34.9) female patients. 74 (26) patients with CHC were having Vit D deficiency and rest of the 215(74) CHC patients were not deficient as shown in table 1. Effect modifier like gender stratification was compared with deficiency of vitamin-D in chronic hepatitis C patients. There were 51 (68.9) male and 23 (31.1) female patients who had the deficiency in chronic hepatitis C patients, as depicted in Table. 2. Effect modifier like age stratification was compared with deficiency of vitamin-D in chronic hepatitis C patients. There were 18 (24.3) and 56 (75.1) patients between age 20 – 30 years and 31 – 50 years respectively, who had the deficiency in chronic hepatitis C patients, as depicted in Table. 3.

	Frequency	Percentage
Yes	74	25.6
No	215	74.4
Total	289	100.0

Table. 1 Frequency & percentage of deficiency of Vitamin-D in chronic hepatitis C patients

Gender	Vitamin-D deficiency in chronic hepatitis C patients		p-value
	Yes	No	
Male	51, 68.9%	137, 63.7%	0.419
Female	23, 31.1%	78, 36.3%	
Total	74, 100.0%	215, 100.0%	

Table. 2 Effect modifier like gender stratification with deficiency of vitamin-D in chronic hepatitis C patients

Age Cohorts	Vitamin-D deficiency in chronic hepatitis C patients		p-value
	Yes	No	
20 - 30 (years)	18, 24.3%	66, 30.7%	0.298
31 - 50 (years)	56, 75.7%	149, 69.3%	
Total	74, 100.0%	215, 100.0%	

Table 03 Effect modifier like age group stratification with deficiency of vitamin-D in chronic hepatitis C patients

DISCUSSION:

Skin, kidneys and liver play a pivotal role in vitamin D synthesis. For its physiological effects, vitamin D receptors (VDR) are to be present. Interaction of vitamin D with VDR then activates several pathways which then play important roles. Different steps of inflammation, immune response and fibrosis are mediated by vitamin D activated pathways. Also it has been found to be liver protective[13]. VDR are presents on liver cells, inflammatory cells and biliary tract cells. But with advanced hepatic fibrosis its expression is reduced[13]. Deficiency of Vitamin D has been found in both, cirrhotic and chronic liver disease patients. These cohorts have also been found to have high mortality. Due to this

fact researchers are trying to find a relation between chronic live disease and vitamin D level. The most common etiological agent of chronic liver disease and cirrhosis in Pakistan is hepatitis C[14]; therefore we carried out this study to look for vitamin D level in these patients. The findings of our study also show many of the chronic hepatitis C patients, who were also vitamin D deficient.

Ribavirin (RBV) and Pegylated interferon (PEG-IFN) are used to treat HCV infection. The duration of treatment depend on the type of HCV. For genotype 1, the 48 weeks and for genotypes 2 and 3, 24 weeks treatment is recommended. The main aim of treatment for HCV infection is to clear the virus from the blood, and that after the treatment; undetectable serum HCV RNA level is sustained. This is what is called sustained virologic response (SVR). Among the subtypes, Genotypes 2 and 3 have better response to therapy and the SVR rates approaches up to 70%. Patient with genotype 1 have poor response to conventional treatment and its SVR rate is up to 50%. Most recent studies are searching for metabolic and genetic factors which may influence the response to treatment. However, results of these are inconclusive[15]. But still in recent literature, like our study, patients having chronic hepatitis C have been found to be deficient in vitamin D, and hence vitamin D supplementation to standard therapy of hepatitis C has been suggested[5].

It has been seen that in patients with chronic hepatitis C, disease outcome is affected by patient's vitamin D level and most of the patients with chronic hepatitis C were found to be deficient in vitamin D. A large multi centered study, carried out in Sicily, revealed that patients with CHC infections have vitamin D levels lower, as in comparison to age and sex matched healthy cohort. Level of Vitamin D was less than 30ng/ml (43.1±10.2ng/ml) in 6% of the healthy population, whereas in chronic hepatitis C, more than 70% were found to be deficient in vitamin D (25.1±9.9ng/ml). This difference was statistically significant(p<0.0001)[16]. In contrast, in our study only 25% patient with chronic hepatitis C had deficiency of vitamin D. How does this low level of vitamin D affect disease response and outcome in patients of CHC is still not yet clear. Few possible mechanisms have been suggested. In some recent literature it has been opined that hepatitis C virus interferes with metabolism of lipids, thus resulting in low vitamin D level; 7-dehydrocholesterol which is a vitamin D precursor, its synthesis is blocked by hepatitis C virus. Also more recent studies have pointed out that the more severe the deficiency of vitamin D in chronic liver disease; the more grave its complications are[17].

A Spanish study enrolled 108 chronic hepatitis C cases, and found that 36% of the study population was vitamin D deficient. Whereas in our study total patients were 289 and 25% patients out of these were vitamin D deficient. In their study found that the mean age in years was 52.2 ± 9.0. Whereas in our study mean age in years was 34.51+8.32. Similar to our study most of the patient population was male. They concluded that vitamin D supplementation in study population corrected vitamin D level but it had no effect on biochemical profile and treatment response. They have larger percentage of study population with vitamin D deficiency as compared to our study. This difference may be due to variation in geographic area. Also they carried out the study in winter season at which time there is little sun exposure. This might have added to larger number patient being vitamin D deficient[18].

Most recent literature has stated that around 60% of the chronic hepatitis C cases have vitamin D hypo-vitaminosis in most part of the world including USA and Asians countries. In our study it was 25%. Also it has been found that vitamin D is having antiviral activity and that it directly suppress hepatitis C viral replication. Similarly in contrast to previous studies it has been proved that vitamin D supplementation also improve SVR with little additional adverse effects and cost[19].

There are few limitations of our study. It was a single centered study. We did not study patients' treatment response with and without vitamin D supplementation. We did not investigate the effect of vitamin D addition, on biochemical profile and sustained viral response (SVR). It is therefore recommend that multi centered study on larger scale are required to be carried out. Also vitamin D effect on SVR is to be studied.

CONCLUSION:

Patients of CHC had high frequency of vitamin D deficiency which suggests that further studies in the region will be conducted in our general population to know the exact statistics which will lead the way for enthusiastic researchers to plan more researches in this domain to prevent hepatitis C virus related diseases in the region.

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Original Article

Attitudes Of Final Year Dental Students Towards Postgraduate Specialization

Fasiha Moin Kazi, Shama Asghar, Syed Adeel Ahmed

ABSTRACT:

Objective: The aim of this study was to understand the preferences of final year dentistry students in postgraduate specialization and explore the factors which influence them in making decisions regarding their future in pursuing postgraduate studies.

Methodology: A cross-sectional survey was carried out between August 2017- January 2018 at four dental colleges across Karachi, including, three private sector and one public sector institution. A multiple choice, closed-ended questionnaire consisting of 8 statements was prepared and distributed among all the final year BDS students. 225 used and 200 student responses were recorded. Data was analyzed using SPSS version 23 and Chi Square was applied to achieve the results.

Results: 81% of the respondents were females. 79% were in the age range of 22-23years. 63% age of students had parents that came from a professional background. 75% of the total respondents wanted to pursue postgraduate studies. The link between the age of the student, gender and the willingness to pursue postgraduate studies was found to be insignificant whereas with parental profession, it was significant (p value=0.016). 60% students believed that they had received enough specialty exposure and encouragement from their institutions to be able to decide on their postgraduate plans. The first choice of specialty for 28% students was Oral Surgery followed by Orthodontics and Endodontics for 22% respondents. The second choice of specialty for the students was Operative Dentistry for 30% of the students followed by 17% who preferred Orthodontics. The rest were divided among the other subjects. 36% of the students cited their aptitude for a specific field as the most common factor for affecting their decision on specialization. 28% cited job status/ prospects and financial reasons as the factor most likely to influence their decision on specialization.

Conclusion: According to the study, there was no significant association between the age, gender and the preferences of the student towards postgraduate specialization. However, parental occupation was bound to play a role. The choices of the students as regards specialty selection and influencing factors are varied. As the trend towards postgraduate specialization in dentistry is gaining momentum, it is imperative to research this area more for better planning and allowing students to make informed decisions.

Key words: attitudes, postgraduate, preferences, specialization, Karachi, Pakistan

INTRODUCTION:

Specialization in dentistry is a relatively new concept in Pakistan with dentistry being considered a specialized subject per se by the vast majority[1]. However with the increase in the number of dentists across the country due to the mushrooming of dental colleges[2] in the last two decades, the need for specialists in the field has never been greater. To date, there are 19539 general dental practitioners and 1867 specialist dental practitioners registered by the Pakistan Medical and Dental Council in Pakistan[3]. There are 506 dental specialists registered in Sindh[3]. However, there is very limited data available about the preferences of the graduates and budding specialists[4]. This study is an attempt to understand the factors which lead students towards specialization as well as the factors which discourage them from further studying. As the available local literature on the subject appears to be scarce and almost non-existent it is hoped that this study would help understand and record the trends in postgraduate specialization in dentistry and that this would encourage others to research further into this important arena. As data collection is the basic step towards better planning, further research would help in better planning and resource allocation for our postgraduate programs.

A study of international trends on this subject reveals that each country may have its own set of preferences for specialization and that this may be dictated by the cultural norms as well[5]. For instance, in Japan, the percentage of students favoring specialization has been 38.8% as compared to the UK where its 83%[5]. With the traditional Japanese business and societal model more focused on generalization, this seems to be a likely result[6]. It is also speculated that the inheritance of private dental set-ups by young second

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generation Japanese dentists also acts as a deterrent in pursuing further studies[5]. Similarly in Iran, the majority of the students planned to enter private practice; fewer intended to pursue specialty education abroad[7]. The most popular reasons for these students' choice of dentistry as a career were a general interest in medicine and a desire to enter a prestigious profession with high social status. Most of the female students planned to work in a group practice environment such as a clinic rather than a solo practice[7] and single students showed greater enthusiasm than married ones for pursuing further studies abroad after graduation[7].

In the UK, final year students place Orthodontics as the most preferred subject for specialization followed by Restorative Dentistry [5, 8]. In Sweden, Oral Surgery is the preferred field [5, 9]. Thai students are also most interested in Oral surgery whereas students in Canada prefer Orthodontics [5, 10]. A study carried out by the Annual American Dental Education Association from 1995-2004 in all the dental schools across the USA places Orthodontics as the most preferred area for specialization by students followed by Oral and Maxillofacial Surgery and Pediatric Dentistry [5, 11]. Another study carried out at a dental school in the US emphasizes the role of gender in the decision for specialization. It states that male dental students are more likely to opt for Oral Surgery while female students prefer Pediatric Dentistry [5, 12].

MATERIALS AND METHODS:

A cross-sectional survey was carried out from August 2017 to January 2018 using a closed-ended questionnaire which was provided to students of final year BDS. Students from Bahria University Medical and Dental College, Baqai University Dental College, Fatima Jinnah Medical and Dental College and Dow University of Health Sciences participated in the study. Sample size was estimated from openepi.com software. The conditions were 95% confidence interval, 5% margin of error. Population size was estimated to be 525 (secondary source of information collected form selected colleges) at a prevalence rate of 50%. The required sample size was drawn to be 223. Ethical approval was obtained from the Ethical Review Committee at Bahria University Medical and Dental College; ERC no. 06/2018. Informed consent was obtained from all the participants.

In questionnaire, participants were categorized on the basis of age, gender and parental occupation. The purpose was to find if there was a potential link between these characteristics and the preferences of the subjects towards specialization. Students were asked to identify their first and second choice of specializing subject in dentistry. They were then asked about the factors which might influence their decision in a positive as well as negative manner. The role of institutional encouragement and/or guidance was also explored. As identified in the literature review, the positive influencing factors included financial prospects, professional status, aptitude for a particular specialty and family and friend's expectations. Distracting or discouraging factors included the length of time needed to complete postgraduate studies, cost or expense of the course, competition in postgraduate studies, further studying and the lack of any particular need to specialize.

SPSS 23 was used for compilation of the data. Frequencies were calculated for all the categories as well as the factors. Chi Square was applied and a p -value of less than 0.05 was considered significant.

RESULTS:

A total of 225 questionnaires (n=225) were completed by final year BDS students. Seven questionnaires were not completely filled by students and so were excluded from the study, making n=218.

81% of the respondents were females. 19% were males. 79% of the students were aged 20-23 years. 13% of the students were aged 20-22 years. 4% of the students were aged 24-25 years. 4% of the students were aged 26+ years. 63% of respondents had parents with a professional background. 20% parents were from a managerial/corporate background. 10% parents were skilled (Technical). 6% parents were skilled (non-technical). 2% were of various other backgrounds. 75% of respondents were interested in pursuing a specialist career; 9% of respondents did not want to study further, 16% students were undecided about their future plans.

Relationship between age and post -graduation: The relation between the age of the respondents and their willingness to get a postgraduate education was not significant as a p-value of 0.418 was achieved. 59.6% of the respondents belonging to the 22-23years age group wanted to pursue a postgraduate education.

Relationship between gender and post -graduation: The gender of the respondents did not have a significant influence on the decision to specialize as p-value was 0.48 (Table 3). 76% of the total females wanted to pursue postgraduate studies as opposed to 71% of the total males. (Table 1)

Relationship between parental occupation and post-graduation: Parental occupation had a significant influence on the decision to specialize as p value was found to be 0.016 (Table 2). 82% of students who had parents from a professional background showed interest in pursuing specialization.

Institutional support: 60% students believed that they had received enough specialty exposure and encouragement from their institutions to be able to decide on their post-graduate plans. 40% students believed otherwise (Fig.1).

First choice of specialty: 28% respondents chose Oral Surgery as their first choice of specialty for postgraduate studies. 22% chose Orthodontics and Endodontics. Pediatric Dentistry was opted by 11.5%. Operative Dentistry was

Gender	Do you intend to pursue a specialist career?			Total
	Yes	No	I have not decided yet	
Male	30 71.4%	3 7.1%	9 21.4%	42 100.0%
Female	134 76.1%	17 9.7%	25 14.2%	176 100.0%
Total	164 75.2%	20 9.2%	34 15.6%	218 100.0%

Table 1: Gender-wise distribution of respondents intending to pursue post-graduation

	Do you intend to pursue a specialist career?			Total
	Yes	No	I have not decided yet	
Professional	112, (81.8%)	13, (9.5%)	12, (8.8%)	137
Managerial/Corporate	26, (59.1%)	3, (6.8%)	15, (34.1%)	44
Skilled (technical)	16, (76.2%)	2, (9.5%)	3, (14.3%)	21
Skilled (manual)	8, (66.7%)	1, (8.3%)	3, (25.0%)	12
Others	2, (50.0%)	1, (25.0%)	1, (25.0%)	4
Total	164, (75.2%)	20, (9.2%)	34, (15.6%)	218

Table 2: Relationship between the parental occupation and the desire of the respondents to pursue post-graduation

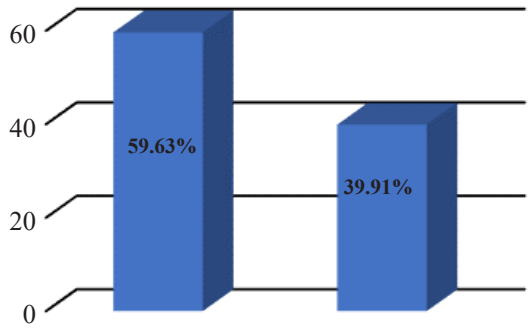

Fig. 1 : Perceived institutional support of the respondents willing to pursue postgraduation.

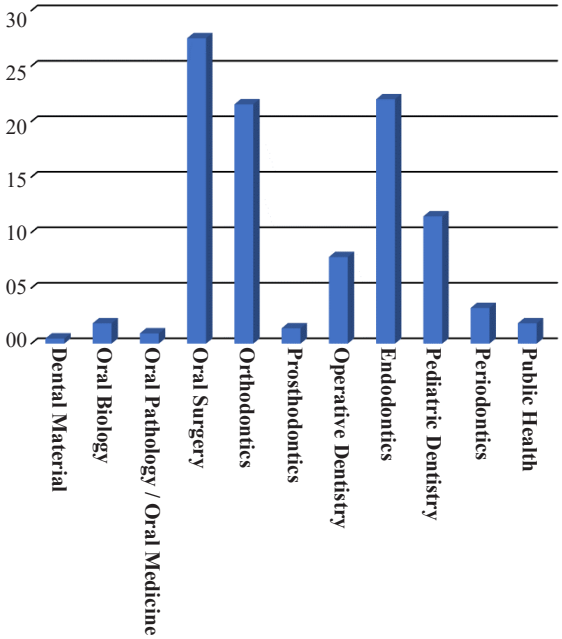

Fig. 2: First choice of specialty for post-graduation as decided by the total number of respondents.

chosen by 7.8%. Periodontics was opted by 3.2%. 2.3% chose Oral Biology. Public Health was opted by 1.8%. Prosthodontics was chosen by 1.4%. 0.9% chose Oral Pathology/ Oral Medicine. 0.5% of students chose Dental Materials (Fig. 2). 29% of males wanted to choose Oral surgery as their first choice of specialty followed by 26% who wanted to opt for Orthodontics. 27% of females wanted to choose oral surgery as their first choice of specialty followed by 25% who wanted to choose Endodontics.

Second choice of specialty: 30% of students wanted to opt for Operative Dentistry as their second choice for specialization, followed by 17% who preferred Orthodontics. 12% opted for Endodontics. 11% chose Oral Medicine /Oral Pathology. Prosthodontics was chosen by 6.9%. Dental Materials, Pediatric Dentistry and Public Health were selected by 2.3%, Oral Biology was chosen by 0.9%, Pediatric Dentistry was chosen by 2.3%. Thirty one percent males opted for Operative Dentistry as their second choice of specialty whereas 19% opted for orthodontics. 30% females opted for orthodontics as their second choice of specialty whereas 17% opted for Orthodontics.

Influencing factors on post-graduation decision: 36% of the students cited their aptitude for a specific field as the most common factor for affecting their decision on specialization. 28% cited job status/prospects and financial reasons as the factor most likely to influence their decision on specialization. Family and friend's expectations were cited by 12.4%. Further studying was opted by 12.8%. Professional status was cited by 6.9%.Dearth of specialists in the country was cited by 3.2%.

Discouraging factors for postgraduate studies: 40.4% students cited the length of time needed for postgraduate studies as the most likely reason to get discouraged from specialization. 24% of students chose the cost of specialization and the expenditure incurred as the reason most likely to discourage them from specialization. Further studying was cited by 16.5%. Too much competition was cited by 14.2%. 5% students felt they did not need to specialize.

DISCUSSION:

The majority of the participants of the study (80%) were females and belonged to the 22-23 years age bracket. It is a fact that an increasing number of female students are opting for medicine and allied sciences in Pakistan[13]. The reasons for this are manifold. However, this makes it difficult in this study to establish any true association between gender and the predilection for postgraduate studies as the majority of respondents are already females. If we consider the total respondents, around 75% of them showed an interest in pursuing postgraduate studies which is encouraging. What remains to be seen is how much of this interest translates into actually undertaking specialization and what are the factors that hinder the process; this can be the subject of further research in this area.

The fact that 60% of the students suggested that they had received institutional exposure or guidance regarding their post-graduation suggests better awareness, counseling and mentoring are being undertaken at institutional level for students to make informed decisions about their future. This is an encouraging trend for developing countries like Pakistan. Around 82% of students came from a background of professional parents and the association between parental occupation and an interest in postgraduate studies was established[14]. A possible reason for this association could be the greater importance to education and studies imposed by parents who had achieved a certain level and awareness of education themselves.

On the matter of deciding the first choice for specialization, opinion appeared divided and there was no particular swing towards any one field or specialty. However, most of the students opted for clinical science subjects like Oral surgery and Orthodontics rather than basic science subjects. This may be attributed to the fact that psychomotor skills and clinical procedures constitute an integral part of dentistry[15] and by the time a student is done with final year, it is difficult to imagine a professional dental surgeon who is not involved in practical work. Also, these subjects offer better remuneration as compared to the other options available[16]. For the second choice 30% of students opted for Operative Dentistry with the rest being divided among other specialties. The most common influencing factor were an aptitude for the specialty (36%) and job status/prospects and financial reasons (28.4%).

The fact that students cited the length of time needed to complete postgraduate studies as the most discouraging factor followed by the expenditure incurred is also self-explanatory. As most of the respondents were females, it can be understood that the postgraduate period is also the most demanding time on the domestic front. Multiple factors like raising a family and bearing their financial and other responsibilities can affect the decision making process. It is imperative that appropriate measures are taken on the national level to facilitate the female work force in dentistry in pursuing their further studies. The dearth of adequate child-care centers and stipend/financing for post-graduation studies can discourage a good number of talented professionals from progressing in their careers[17]. From the point of view of male doctors, the remuneration factor seems more important as the additional cost of studies has to be weighed with the financial responsibilities of the family[17,18]. Steps need to be taken in this regard to remove all hindrances towards pursuing a postgraduate specialization. A review of the local and regional literature related to the study shows that there is a dearth of available data on the subject. More research needs to be conducted in this important domain. The responses received show that the concerns of the students and their preferences need to be considered when planning out postgraduate programs[19, 20]. More research in this field

can help in good planning and an improvement in the standard of care of our health care system[21, 22, 23].

CONCLUSION:

This study shows that a large number of undergraduates had an intention to specialize, with Oral Surgery, Orthodontics and Endodontic being the most popular planned subjects, although many were still undecided at this stage. The parental occupation of the student play an important role in the eventual preferences but the choices are varied and as the students' value time and finances at this important juncture in their lives, adequate and well-tailored programs need to be planned to suit the needs of our students and to facilitate them in becoming better clinicians and academicians. More data needs to be collected, however, to allow informed decision-making for the students as well as the institutions.

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Original Article

Awareness Regarding Implant Supported Dental Prosthesis; A Survey In Tertiary Care Set Up

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ABSTRACT:

Objective: This research was aimed to assess the awareness and attitude regarding implant-retained prosthesis as the most advanced option for tooth replacement amongst residents of Karachi visiting tertiary care centre.

Methodology: This cross-sectional survey was conducted in the department of Prosthodontics at Bahria University Dental Hospital, Karachi. Undertaking the demographic characteristics of patients, the objective was to determine the awareness and attitude toward implant supported prosthesis.

Results: Amongst 380 responses retrieved, 9.8% of respondents were aware about the dental implant treatment. While correlating awareness with demographics features, awareness statistically increased with educational level (p= 0.00) and occupational category(p=0.01) of the participants. The friends and relative s(40.5%) were the main source of information regarding dental implant treatment modality. 54.1% were unwilling to undergo treatment with dental implant whereas high cost (55.2%)was the major limiting factor for implant treatment. 64.9% demanded dental insurance for getting the treatment. 45.9% had no knowledge regarding maintenance of implant supported prosthesis .73.0% had no idea regarding longevity of dental implant where as 86.5% were unaware of it's impact on systemic health.

Conclusion: The overall awareness regarding implant supported prosthesis was found to be minimal. This underlines the need of efforts and measures that should be made to raise the awareness and thus alter attitude towards dental implant therapy. Expensive rates (55.2%) was found to be the major limiting factor that should be relieved in the form of health insurance policies, especially in the developing countries like ours.

Keywords: Attitudes, Awareness, Missing teeth, Patients, Replacement

INTRODUCTION:

Asian population has the third highest prevalence of periodontitis which is an alarming signal for toothloss[1]. DMFT score increases with age, also indicating a dire need for tooth replacement at a large scale[2]. A detailed investigation of the National Health and Nutrition Examination Survey (NHANES) from 1999 to 2004 revealed that the individuals aged 20–34 years had 85.58% DMFT score , 35–50 years had 94.30% DMFT level and 50–64 years aged people showed 95.62% DMFT grading[2]. Literature search shows that conventional methods of dental rehabilitation like removable dentures are unable to satisfy patient needs and demands[3]. That's why small number of partially and completely edentulous patients are unable to accept removable prosthesis at all due to the various factors related to anatomy, psychology and prosthodontics. Undertaking the above fact into consideration, approximately one million dental implants are inserted per year worldwide[4].

Long-term clinical trials have also proven the efficacy of implant supported prosthesis. That's why dental implants emerge with universal acceptance and popularity amongst the dental community[5]. In 2010, Eklund SA in his paper regarding trends in dental treatment in the United States claimed increase employment of dental implant therapy[6].

Pakistan's literacy rate has decreased from 60% to 58%, as retrieved by the economic survey of Pakistan[7]. Despite of this fact, majority urban population comprising of well educated individuals,[7] would consider implant supported prosthesis as a replacement option if they have the awareness of this treatment method[8].

Globally, it has also been observed that knowledge regarding dental implant treatment in the developing countries is very low[9]. In account to the above mentioned scenario, the current investigation was carried out to assess the awareness status and thus the attitude towards implant retained prosthesis among patients visiting a tertiary care hospital in Karachi.

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SUBJECTS AND METHODS:

This descriptive, cross-sectional study was conducted in the out patient department of Prosthodontics at Bahria University Medical and Dental College, Karachi. The duration of the study was six month sextending from June 2016 to Nov 2016. The objective was to determine the awareness and attitude towards implant supported prosthesis among population requiring tertiary management. The ethical approval was obtained from the institutional committee. WHO sample size calculator was engaged to determine the sample size at the confidence level of 95%,and was found to be 380. A modified version of questionnaire was used in this study and tested on 30 patients. All subjects were interviewed using the questionnaire. It composed of demographic details, awareness status along with the resources of knowledge, various constraints in implant therapy, knowledge regarding maintenance, longevity and impact on systemic health. The inclusion criteria involved replacement seekers involving complete or partiale dentulism in any or both of the jaws. The exclusion criteria was applied on patients who were not indicated for any prosthetic rehabilitation, having dental implants previously, acquiring professional dental knowledge or unwilling to participate in the study. Descriptive analysis of the collected data was done using statistical package for social sciences version 17.0. Chi- square test was applied to establish relationship between awareness and demographic variables of the candidates.*P* valueof <0.05 was considered to be significant.

RESULTS:

Three hundred and eighty patients were gauged with 47.6% male and 52.4% female patients. Regarding demographics of the candidates, 29.2% belonged to the age group of above 50 years.Majority that is 42.4% participants were illiterate. 244(64.4%) patients belonged to the unskilled group while 136 (35.6%) patients were the members of skilled group. Regarding dental status, 35.3% and 64.7% were partially edentate in the maxillary and mandibular arch respectively.

Only 9.8% had knowledge of implant supported prosthesis.While correlating dental implant awareness with the demographics, awareness statistically increased with the educational level (p=0.00) and category of occupation (p=0.01) of the participants (table-1). Friends and relatives (40.5%) were the main source of knowledge. 54.1% were unwilling to undergo treatment with dental implant. High cost (55.2%) was found to be the major hindrance in availing implant treatment(table -2). 64.9% demanded dental insurance for getting the treatment. 45.9% had no knowledge regarding requirement of oral hygiene of implant supported prosthesis. 73.0% had no idea regarding longevity of dental implant. 86.5% were unaware regarding impact on systemic health.

Demographics Variables versus implant knowledge	p- value
Age	0.13
Gender	0.42
Education	0.00
Occupation	0.01
Dental status	0.09

p- value is computed via chi-square test where the significance is at 0.05 level

Table 1: Correlation of demographic features with Dental Implant Awareness Status

Obstacles in availing treatment	Percentages
High cost	55.2%
Confusion regarding procedure	10.3%
Surgery need	10.3%
Medical issues	13.8%
Others	10.3%

Table 2 Hindrance factors in availing dental Implant therapy

DISCUSSION:

Dental implants have been in the limelight in the field of dentistry over a decade and a half now. With improving long term prognosis of implant supported prosthesis majority patients are demanding dental implants as the supreme choice for rehabilitation of missing teeth[10]. Implant supported prosthesis is emerging as the most advanced treatment approach to manage partial or complete edentulism[11].

It enhances retention, stability, functional efficiency, quality of life and hence long-term prognosis[12]. The periodical need of an epidemiological survey regarding dental issues has driven this research work to be carried out. This survey was executed to assess awareness and attitude towards implant retained dental prosthesis among patients reporting to tertiary care hospital in Karachi.

The assessment tool was an adapted questionnaire to accomplish the foremost and secondary motives of the research[13]. Patient's occupation was grouped into skilled and un skilled categories. Jobs such as labourers, gardeners, mechanics were placed in the un skilled while others working as engineers, doctors, inspectors were placed in the skilled group. It is the modified extract derived from the study did by Ghani F et al[14]. As the study venue was hospital setup where mostly low literacy patients reported so the preferred mode of data collection in author's point of view was in-depth interview session in local language rather than proforma filled by candidates independently.

The present study reveals 9.8% awareness regarding implant supported prosthesis. Our study is in close parallelism with other Pakistani studies like Ghani Fet al[14] (16.6%)and Sohail M et al[15] (28%)However, another study conducted in Rawalpindi[16], a city of Pakistan, shows awareness status of 60% which is quite better than the current investigation and

other above mentioned national studies.Similar results observed in the international surveys did by Al- Johany S et al[5](66.4%), P[17] (52.6%), Tepper G[18] (72%) and Kohli S et al(56%)[19].

This may be due to the low socioeconomic status and low literacy level of the participants as the present study's interpretation also shows the significant association of implant awareness with education and occupation variables. Saha A et al[20] also supports the positive correlation among variables of implant awareness, education status and mode of occupation. Additionally, it also established significant association of age, gender with implant acknowledgement which contradicts to the current analysis[20]. Ghani F et al[14] and Hasnain SF et al[21] also signify the role of education status in acknowledgement and attitude towards implant supported prosthesis.

The current investigation reveals friends and relatives are the prime source providers followed by dental professionals. This is in close agreement with the studies did by Ghani F et al[14], Qayum B et al[22] Malik AS et al.[16] The present study result is in contradiction with the survey did by Al- Johany S et al[5] and Saha A et al[20] who reported dental professionals were the main source of information followed by media about implant supported prosthesis. Al- Musawi A et al observed media dominancy in spreading dental implant awareness followed by social gatherings.[23] This may be due to the general awareness gained through regular dental checkups and frequent visits to a dentist in those countries than ours.

The expensive charges followed by medical problems are the major hurdles in opting the implant supported prosthesis. This closely resembles Ghani F et al,[14] Malik AS et al,[16] Saha A et al,[20] Deeb G et al[24]. That's why the greater number of candidates demand insurance coverage for the implant treatment in the present work. Malik A et al also claimed that 93% of the candidates of his study were of the opinion of providing insurance coverage[25]. Chowdhary R et al also observed the similar scenario regarding insurance of dental implant treatment[26].

The current study also explores the lack of knowledge regarding maintenance, longevity and the impact of dental implant therapy on systemic health. CO et al[13] in his survey involving 527. Turkish adults reported 16% of the total sample population believed that their dental implants would last forever followed by longevity >10 years. Sawal P et al[17] also reported the same scenario where majority (58.9%) thought lifetime longevity of the implant treatment and the requirement of greater oral hygiene than the natural dentition.Above 90% of the respondents believed that implant retained prosthesis were very good or good, an outcome observed by Malik A et al during the investigation in natives of Lahore[25]. The above mentioned studies are contradictory to our work where total lack of knowledge was found. This may be due to low literacy level sample population with low socioeconomic status or lack of resources, as acquired by the sample population of the present work. The overall scenario may vary if conducted in a private setting. The lack of community awareness programs and lack of resources in the general population, as evident from this study, is the prime cause of low consumption of this treatment modality. A multicenter study with extract of the true population should be called out to validate the current results.

Hence this level of overall awareness regarding implant retained prosthesis underlines the need for putting more emphasis on the said topic to upgrade dentistry in Pakistan.

CONCLUSION:

Within the limitations of the study, the overall awareness regarding dental implant treatment was observed to be lacking. Knowledge statistically improved with the educational status and category of occupation. Friends and relatives (40.5%) were the main source of knowledge. High cost (55.2%) was found to be the major hindrance in availing implant treatment. To overcome the financial crisis, health insurance policies should be revised and upgraded at the government level.

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CONFLICT OF INTEREST:

There was no conflict of interest.

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Original Article

Frequency And Shape Of Torus Palatinus In Relation To Age And Gender In Karachi

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ABSTRACT:

Objective: The aim of this study was to determine the frequency and shape of torus palatinus and to assess its gender and age-related differences in the population of Karachi, the metropolitan city of Pakistan.

Methodology: This was a cross sectional study with non-probability convenience sampling method conducted at Bahria University Medical & Dental College (BUMDC), Karachi. The presence of tori was observed by clinical examination and palpation. The shape was also investigated by presence or absence and classified as flat, spindle and nodular shaped tori. The data was analyzed by using Statistical Package for Social Science version 23. The Chi-square test was used to test for group differences of sex and age association with the prevalence of tori. Difference between groups with P <0.05 was considered significant.

Results: A total of 1203 patients were screened in which torus palatinus was found in 141 (11.7%) patients. Present study findings showed torus palatinus was more prevalent in males 76 (53.9%). It was dominant in 31-60 years of age group (47.5%) with significant P=0.000. Shapes of torus palatinus were compared with gender in which flat shape was more frequent in both male and female with significant P-value of 0.015.

Conclusion: Torus Palatinus is a rare bony exostosis of the oral cavity. Even though, it is an asymptomatic anatomical variation it expresses itself in unique shapes and patterns. The prevalence varies with respect to age and gender.

Keywords: Torus Palatinus, Bony exostosis, Shapes, Pattern, Prevalence

INTRODUCTION:

Torus Palatinus (TP) is referred as a benign intraoral anatomical bony protuberance that is located along the midline of the hard palate[1]. It is formed by excessive functioning of osteoblasts leading to bone deposition along midline of the vault[2]. It is also designated as hyperostosis, exostosis and osteomas[3].

The etiology of TP is not well established but researchers have attempted to clarify the influence of genetics in its formation[4]. Others have suggested environmental, nutritional, masticatory hyperfunction, superficial traumatic injuries and continuous growth as its predisposing factors[5]. However, more widely accepted theory suggests genetics and environmental factors to have a strong association with TP[6]. The development begins in early adult life progressing and enlarging slowly over time[7]. Its presentation before the age of 10 years is very rare usually developing in second to third decade of life[8]. In most instances TP are asymptomatic however, extremely large sizes may need to be surgically removed since they may interfere with denture construction[9,10]. The aim of present study was to determine the frequency and shape of TP and to assess its sex and age-related differences in the population of Karachi, the metropolitan city of Pakistan.

MATERIALS AND METHODS:

This was a cross-sectional study with non-probability convenience sampling. Study was conducted in dental out patients department of Bahria University Medical & Dental College (BUMDC), Karachi from June, 2017 to June, 2018. The present study comprised of 1203 edentulous subjects (561 men and 642 women) aged between 10 to 90 years. The Ethical approval was obtained from the College ethical committee, BUMDC. Informed consent was taken from all the participants included in the study. Subjects were assorted

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based on their sex and were classified into three age groups, namely 10-30, 31-60 and 61-90 years. The existence of tori was determined by clinical examination and palpation, and result of the test was recorded as present or absent. Patients who refused to participate in this study were excluded. Changes in the mid part of the palate were analyzed and were classified as flat, spindle and nodular shaped tori. In case of presence of tori, study casts were made using Kromopan Alginate (alginate impression material) for assessment of the size, shape, and location of the tori. The data was analyzed by using Statistical Package for Social Science (SPSS) for Windows Inc. Version 23.0 Chicago, Illinois. The Chi-square test was used to test for group differences and sex and age association with the presence or absence and shape of TP. The difference between groups with *P* =0.05 was considered significant.

RESULTS:

Total 1203 dental patients participated in this study. Out of which 561 (46.63%) were males and 642 females (53.37%). The mean age of patients was 31.94 and STD±15.97. TP was observed in 141 (11.7%) patients. Present study findings showed TP was more prevalent in males 76 (53.9%) than female 65 (46.1%) as shown in (Figure 1). This bony exostosis was also investigated according to age groups and found significant in present study P<0.05. TP was dominant in 31-60 years of age group recording 67 cases (47.5%) and least one was in 61-90 years of age group as shown in (Table 1).

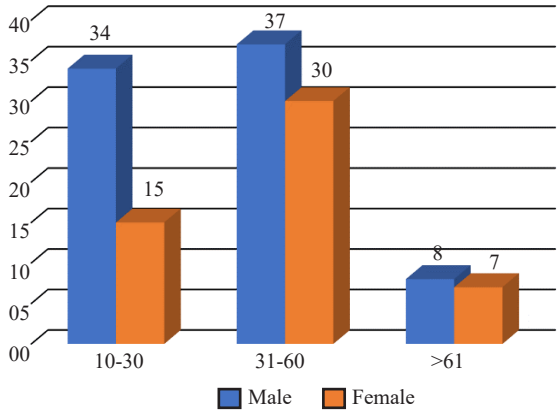

Figure 1: Age and gender distribution of patients with TP

Age (years)	TP		P-value
	Present	Absent	
10-30	59, 41.8%	673, 63.4%	0.000*
31-60	67, 47.5%	318, 29.9%	
β 61	15, 10.6%	71, 6.7%	
Total	141, 100.0%	1062, 100.0%	

*Chi square test was applied
*P=0.05 considered to be statistically significant

Table 1: Distribution of TP according to age groups

Gender	Shape			P-value
	Spindle	Flat	Nodular	
Male	16, 47.1%	49, 52.7%	10, 71.4%	0.015*
Female	18, 52.9%	44, 47.3%	4, 28.6%	
Total	34, 100.0%	93, 100.0%	14, 100.0%	

*Chi square test was applied
*P=0.05 considered to be statistically significant

Table 2: Distribution of Shape/pattern of TP according to gender

Figure 2: Spindle-shaped Torus Palatinus

Cross tabulation of presence of TP with shape was further evaluated. Flat shaped torus palatinus was present in majority of cases in both gender followed by spindle-shaped and nodular-shaped (Table 2).

DISCUSSION:

TP is an exostosis of hard plate and is usually considered as an anatomical variation instead of a pathological entity. Studies shows the TP prevalence ranges from 1.4 to 66.0% in different populations.[11] Notable contrast in prevalence of TP was observed in different races. The Mongoloids (East Asians) are reported in superior numbers than Caucasians (Europeans). While TP were reported to be less common in Africans than Caucasians[15]. In the present study, our findings showed TP was highly present in males than females. The study conducted in Croatia showed male prevelance.[2] While ample number of studies showed contrasting results where the prevalence of TP was higher in females than in males. According to one Saudi Arabian study, female and male prevalence was reported to be 22.2% and 10.0% respectively[11]. Similarly, in another study conducted in

Turkey, female predilection was observed as reported cases accounting to more than 5%.[12]. In Thai population, the majority of TP patients were females comprising 70.5% of the sample of TP patients[13]. Research has shown that the palatine tori were reported in females, and this was referred to a dominant type x chromosome[14].

There is an age-related disparity of TP as reported in various literature. Previous studies revealed higher TP prevalence was during the second to third decades of life which is consistent with our results[15]. Apinhasmit et al reported similar results in Thailand with second and third decades having the most patients of TP[13]. In Malay population, second decade was revealed to be most likely associated with TP according to a research by Hiremath et al [16]. On the other hand, several studies reported tori in fifth decade of life[2].

The palatal tori are classified according to their shape as flat, spindle, nodular and lobular shaped. Flat shaped tori was found to be higher in frequency and nodular type was rarest found in both genders in our study[17]. In accordance with our study, flat shaped TP had the highest prevalence in the Iraqi population (7.7%) according to a study by Faiza M. Abdul-Ameer. Spindle shaped tori came later with an occurrence of 6.8% in the populace. Nodular TP has the least reported cases with less than 1%[18]. Similar results were reported by a study conducted by Yildiray Sisman et al in Turkey. 62.7% of total TP patients were diagnosed with flat shaped while 36.3% had spindle shaped occurrence[12]. This variation may be due to difference in number of arch forms samples reported for both genders as the ovoid arch form reported in higher percentage than others (68%)[19]. Differences occur due to type of irritation expose to palate, amount of occlusal forces exerted by each genders, different in age groups, diet variation, hormonal change, number of missing teeth, absent or present of restoration with complete or partial removable restorations[20,21].

Tori are usually an asymptomatic clinical finding with no treatment normally necessary[22,23]. TP often needs surgery to reduce the amount of bone present, as it causes chronic trauma , interfering with oral function or fabrication and replacement of denture base or framework[24,25]. The inconsistent results of various authors possibly are due to the differences in number of subjects and different geographic location[26, 27]. A unique study carried by Mirza et al in Pakistan showed the association of TP among various ethnicities. Urdu speaking community has the highest recorded TP cases in Pakistan[28].

Treatment for TP is not often recommended unless it compromises the patient's quality of life. Surgery is the most common treatment if the tori becomes so large that it impedes the function or denture placement or has recurring traumatic surface ulceration.

CONCLUSION:

Torus Palatinus is one peculiar bony exostosis of the mouth that varies in individuals on the basis of multiple factors. The current study finding showed male dominance with flat-shaped torus palatinus. Even though, it is traditionally asymptomatic the authors are of the view that comprehensive study on a large population sample is a need of time to decipher and understand the link of torus palatinus with its causative factors.

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Original Article

Delayed Presentation Of Missed Vascular Injuries And Pitfalls In Primary Treatment– Experience Of A Vascular Surgery Unit In Pakistan

Ahsin Manzoor Bhatti, Junaid Mansoor, Haroon Sabir Khan

ABSTRACT:

Objective: To analyze errors in primary treatment of vascular injuries and delayed presentations of missed vascular injuries as a surrogate indicator of need for improved vascular surgical training of upcoming general surgeons.

Materials and methods: This retrospective observational study was carried out at vascular surgery department of two tertiary care hospitals of Armed Forces from Jan 2012 to June 2017. Hospital records of all patients with vascular trauma were analyzed for presence of pitfalls in primary treatment and delayed presentation of missed vascular injuries which resulted in redo surgeries or adverse outcomes.

Results: Out of 256 patients with vascular injury sequel 41 had either a problem in primary treatment or presented with delayed complications of missed injuries. The omissions can be divided into: missed injuries (24/41), technical errors in initial repair (12/24), reperfusion of mangled Extremity (3/41) and non availability of a surgeon capable of undertaking vascular repair. The commonest operative fault was failure to debride the vessel adequately and vascular repair under tension. The commonest primary assessment problem was failure to timely appreciate hard signs of vascular injury.

Conclusion: With better training and emphasizing the need of thorough clinical examination outcome of vascular trauma can be improved.

Key words: delayed, injuries, missed, presentation, vascular.

INTRODUCTION:

Vascular trauma is an important component of the rapidly emerging trauma pandemic. The mechanism and pattern of vascular injuries differs in various parts of the world and they will vary in the same community in war and peace. Great majority of these injuries are due to penetrating trauma, with stab, gunshot wounds and road traffic accidents being the most common cause[1-4].

Previously major vascular injuries were either uniformly fatal or led to major amputations. Important lessons learnt during first and second world wars in diagnosis and management of vascular injuries and improvement in vascular repairing techniques pioneered by surgeons such as Carrell, lead to introduction of improved vascular reconstructive methods during the Korean and Vietnam wars with tremendous reduction in amputation rates and improved survival[2-5]. Now the extremity vascular trauma ranks among the leading causes of preventable deaths[6-8]. However, a missed or inappropriately treated vascular injury can lead to limb loss or potentially serious sequel like pseudo aneurysms or traumatic arteriovenous fistulae[9-11].

In Pakistan, vascular Surgery is still in its infancy and there are only a few centers with dedicated vascular surgery departments. Except for two or three centers, there is no formal training of surgical trainees in this important specialty, resulting in a vacuum in management of vascular trauma. The purpose of this article is to share our experience of delayed presentation of vascular injuries and the lapses in the initial management of vascular trauma patients referred to our unit as well as to highlight the need for more structured training in this specialty. A brief overview of recommended management strategies is also provided to serve as a guide for those involved in the management of these critically injured patients.

PATIENTS AND METHODS:

This is a retrospective descriptive study, carried out at two tertiary care hospitals with vascular surgery departments. Approval from Institutional Ethics Review Board was taken. Hospital records of all the acute vascular trauma patients treated at vascular surgery department from Jan 2012 to June 2017 as well as those operated upon for complications of previous vascular trauma during the same period were retrieved manually and analyzed. All the patients with a lapse in primary management of vascular injury were included in the study.

For the purpose of description we divided the patients into those presenting acutely with a lapse in primary management resulting in a need for re-exploration to save life or limb and those patients presenting late, with a complication of previously missed or mismanaged vascular injury like

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presence of pseudo aneurysm, traumatic arteriovenous fistula (AVF) or ischaemia. Those patients with a documented successfully repaired vascular trauma before referral were excluded from the study as well as those repaired in our department not requiring re-exploration.

The records were analyzed to find the cause of poor outcome. The various shortcomings to be analyzed were divided into: delayed presentations of missed vascular injury, missed hard signs, missed compartment syndromes, errors in operative management and non-availability of appropriately trained surgeon.

RESULTS:

During the study period a total of 286 patients presented to our department with vascular trauma or its sequel. A total of 41 patients fulfilled the inclusion criterion and their records were further analyzed. Details of the patients are listed in table-1. The patients consisted of 38 males (93%) and 3 females (7%) with a mean age of 24±12.6 years (range 18-78 years). The lower limb vascular extremity trauma (n=32) outnumbered the upper extremity trauma (n=8). Superficial femoral artery (n=18) was the commonest injured vessel.

All of these patients were either referred from other hospitals or have been under care of another specialty and then referred to us. Road traffic accident (RTA) and firearm injuries were the commonest causes of extremity vascular injury (17 cases each).

The injuries and lapses in initial management can be divided into following groups:

1. Missed Vascular Injuries (24/41 patients)

a) Missed Soft Signs (15/ 41 patients): Fifteen patients presented with delayed presentations of missed vascular injuries (7 had pseudo aneurysms and 8 patients presented with traumatic arteriovenous fistulas). Pseudo aneurysms presented earlier (latest by 12 months) after primary injury than did the traumatic arterio-venous fistulas (up to 20 years post injury).

b) Missed Hard Signs (7/41 patients): Hard signs of vascular trauma were missed in 7 patients. All of them lost their limbs.

c) Missed Compartment Syndrome (2/41): In two patients compartment syndrome was missed, both of them lost the limbs.

2. Technical Errors in Primary Repair (12/41 patients): Following technical errors were observed in the initial vascular repair.

a) Inadequate Debridement of injured vessel (4/12 patients): In four of the patients the damaged vessel was not debrided appropriately. The damaged ends of vessels were either sewed together (two patients) resulting in exposed thrombogenic deeper layer, which led to thrombosis or a thrombectomy had been done (two patients) using a fogarty catheter. Two of these patients reached our department early and they were operated again with debridement and interposition vein graft, resulting in limb survival.

b) Repair Under tension (6/12 patients): In six patients we found that primary repair was done under tension resulting in thrombosis of vessel. This results in graft failure. Three of these patients had major amputations.

c) Use of Prosthetic graft (2/12 patients). In two patients a prosthetic graft had been used despite the availability of native vein. In one patient the graft was 4 mm which was used to bridge the gap between damaged subclavian artery. This was thrombosed when the patient arrived in our unit. The graft was replaced with saphenous vein. In other patient a 6 mm graft was used to repair popliteal artery. It was also removed and replaced with native vein. Both limbs survived ultimately.

3. Reperfusion of mangled extremity: In the presence of extensive musculoskeletal trauma and vascular injuries it may not be a good idea to repair the artery. The chances of blow out of graft are quite high and if the limb survives, it may be a painful, non functional and anaesthetic limb with recurrent wound infections (11). In our series we had two patients with such limbs. All of them had graft blow out between 5th – 8th days and despite attempts at redo of bypass at extra anatomical site, it resulted ultimately in limb loss.

4. Non availability of Surgeon with experience in vascular repair: There were two patients who had arterial injury, which was picked up early, but they lost their limbs because no one was willing to take up the daunting task of arterial repair. By the time they reached at a hospital with adequate facilities it was too late.

A summary of these lapses and outcomes is shown in table no 2.

DISCUSSION:

Major arterial injury poses a challenge to the operating team and is a nightmare for the untrained. The surgical treatment should be based on principles of thorough wound examination and debridement, vascular repairs to restore perfusion as well as fracture stabilization when required. In a polytrauma patient there is a high chance that a vascular injury may be missed[12-13]. Unrecognized or poorly treated arterial trauma has serious consequences of life and limb loss, as evident in present series where failure to timely recognize hard signs of vascular injury had led to loss of 7 out of 9 limbs, technical errors in operative management lead to loss of 5 limbs out of 12 limbs where the arterial repair was technically not sound.

The presence of a "hard" sign of vascular injury mandates an immediate surgical exploration and vascular repair[14-16]. Unless other skeletal injuries are suspected no imaging is

Total Number of Patients	41
Gender M : F	38 : 3
Mean Age (years) ± SD	24±12.6 (Range: 18-78 years)
Region injured	
Lower limb, n (%)	32 (78)
Upper limb, n (%)	8 (20)
Neck n, (%)	1(2
Vessel Injured	
Superficial femoral artery n (%)	18 (44)
Common femoral artery n (%)	4 (10)
Profunda femoris artery n (%)	1 (2)
Popliteal artery n (%)	8 (20)
Peroneal artery n (%)	1 (2)
Brachial artery n (%)	5 (12)
Subclavian artery n (%)	2 (5)
Radial / Ulnar artery n (%)	1 (2)
Vertebral artery n (%)	1 (2)

Table 1: Demographic details of the patients

Lapses	Detail	Outcome
Missed Vascular Injuries (24/41)	Missed Soft Signs (15/24)	All limbs saved
	Missed Hard Signs (7 / 24) Missed Compartment Syndrome 2/24)	All of them had major amputations
Technical Error in initial management (12/41)	Repair without debridement (2/12) Only thrombectomy (2/12) Repair under tension (6/12) Use of prosthetic graft (2/12)	5 / 12 limbs were lost
Reperfusion of mangled Extremity (3/41)	Extensive bone, soft tissue and neurovascular injuries. High MESS score, vascular repair was nevertheless done	All of them lost limbs due to graft blow out.
Non-availability of technically competent surgeon (2/41)	No surgeon in the local hospital agreed to repair. Patients were referred to other hospitals	Both of them lost the limbs.

Table 2: Details of Lapses and outcomes

required and perfusion should be restored within 6 hours of vascular injury[14]. Picking up of hard signs of vascular trauma should, in theory, be straightforward but in our series these were missed in 12 patients. This is quite surprising and points to the fact that there is a lack of 'vascular surgery perspective' at all levels of surgical training. All the doctors involved in care of injured patients need to be reminded again and again to check the distal neurovascular status. A penetrating injury in close proximity to a vessel may cause a partial injury to vessel wall, which may be missed due to presence of distal pulses and absent hard signs of vascular injury at initial presentation[17-18]. As the injured vessel thrombose over time, pulses become absent. Thus there is a need of repeated examination of distal pulses.

Soft signs of vascular trauma are easy to miss unless there is a high index of suspicion and could result in pseudo aneurysm, traumatic arteriovenous fistulas or delayed ischemia[2]. One of useful technique to check for arterial trauma in absence of hard signs is injured extremity index (IEI). It is like ankle brachial pressure index (ABPI) of injured limb compared it with uninjured limb. An index of less than 0.9 is associated with more than 90% chance of arterial injury 19-20. Computed tomographic angiography (CTA) is recommended as the primary diagnostic study for evaluation of penetrating

lower extremity vascular injury[7]. Although duplex scan has a sensitivity of 95-99% and a specificity of 98-99 %, it is operator dependent8. There may be a role for these studies in patients with soft signs of vascular injury or with proximity injuries. We generally rely on Duplex Ultrasound scan followed by angiography in selected cases for detection of subtle arterial injury due to lack of sufficient resources. Non-operative observation of asymptomatic non-occlusive arterial injuries is acceptable7. Patients with normal physical examination findings and an IEI or ABI > 0.9 may be discharged in absence of other injuries requiring admission[7,9,21]. It is also important to remember that some missed vascular injuries may present years later with other symptomatology. Two out of eight of our patients who had post traumatic AVF were being treated for varicose veins while one was treated for lymphedema. This underscores the importance of a thorough history and complete physical examination. The hard and soft signs of vascular injuries should not be missed as they can be picked by a thorough clinical examination. We need to inculcate in out undergraduate and post graduates students the importance of a thorough clinical assessment in a poly trauma patient.

Popliteal artery injury in the form of transaction, laceration, perforation, occlusion, arteriovenous fistula, or intimal injury may follow blunt trauma to the lower extremity in up to 46% cases 22. Up to 20% of limbs associated with knee dislocations and vascular injuries end up in amputations[8]. As evident in our series popliteal artery transaction or thrombosis associated with knee dislocations is easily missed (8 out of 41 cases). It may be due to primary concern for knee dislocation, lack of vascular trauma perspective, and overlooking the repeated vascularity examination after applying a POP cast. It is therefore of utmost importance to repeatedly assess distal pulses for up to 48 hours in cases of knee dislocation as intimal tears may cause thrombosis later[12]. If a patient with fracture has doubtful vascularity it is utmost important that all the bandages and plaster must be removed and then the vascularity reassessed. If hard signs are present then time should not be wasted in unnecessary investigations like Duplex ultrasonography or angiography and the wound should be explored.

The incidence of femoral artery pseudo aneurysm post catheterization is around 3% with obesity, female gender, multiple puncture attempts and use of antiplatelet and anticoagulation therapy as independent risk factors[23]. We encountered two cases of pseudo aneurysm following insertion of dialysis catheter-one in femoral artery and the other in subclavian artery while one case was in an IV drug abuser. The two post-catheterization pseudo aneurysms were primarily repaired while the one in IV drug abuser had an extra-anatomical bypass due to infective field and extensive scarring in the area.

Although endovascular treatment options are increasingly used in many parts of the world, we use it only occasionally because of lack of facilities and expertise. Covered stents for pseudo aneurysm or arteriovenous fistulas and embolization for bleeding is being used successfully[8]. However, the routine use of endovascular therapies in acute post trauma settings following infra-inguinal trauma is not supported by data so far[7].

The decision for open surgery should be made quickly. General principles for surgical repair of arterial injury are: proximal and distal control, debridement of damaged artery, embolectomy of proximal and distal artery followed by proximal and distal infusion of heparin and a tension free repair which should not result in constriction of lumen and the repair must be covered by sift tissues[7]. Simple arterial repairs fare better than grafts. If required, vein graft is the best choice. PTFE, however, is should be used with caution in contaminated fields[7]. We usually do not prefer synthetic grafts for arterial reconstructions in trauma patients; however we recommend its use when the size of venous graft does not match to the injured vessel. Prophylactic fasciotomies should be liberally performed prophylactically in ischemic limbs with delayed repairs.

We also found that technical errors in management of vascular injuries is common. Most common technical error that we found in 6 out of 12 cases is vascular repair under tension. There is a natural urge to mobilize the damaged vessel and to do the primary end to end anastomosis and in doing so the surgeon may compromise on resecting the damaged artery, resulting in apparent success but ultimately leads to thrombosis of the graft due to repair in damaged vessel wall as well as inadequate vessel lengths leading to tensioned repairs. Arterial repair with direct anastomosis fare poorer in blunt trauma or crush injury of a long vessel segment compared to those with penetrating injuries[12].

As mentioned earlier in four patients the damaged vessel was not debrided appropriately. The damaged ends of vessels were either sewed together (two patients) resulting in exposed thrombogenic deeper layer, which led to thrombosis or a thrombectomy had been done (two patients) using a fogarty catheter. The reason for doing only thrombectomy was apparently 'normal' appearance of damaged vessel. Excessive stretching of an artery results in intimal tear which exposes deeper thrombogenic layer and leads to thrombosis and dissection of distal vessel. From the outside damaged thrombosed vessel appears normal and a less experienced surgeon may be deceived by this appearance, who therefore only opts for thrombectomy.

The use of temporary intravascular shunts (TIVSs) may be indicated to restore arterial flow in combined vascular/orthopedic injuries (Gustillo IIIC fractures) to facilitate limb perfusion during orthopedic stabilization. They are also valuable as a part of damage control surgery or to gain time if the facilities of arterial repair are not available[7,24,25]. They have been used extensively by the

American forces in Iraq and Afghanistan and we find it useful in our experience as well. But a word of warning; it is utmost important that proximal and distal vessels must be cleared of all the clot and it should be flushed with heparinized saline before inserting a shunt. In addition kinking, dislodgement and pressure on the shunt can also result in ischemia.

CONCLUSION:

Many limbs and lives can be saved by a thorough clinical examination in a poly trauma patient. A high level of suspicion, in conjunction with the knowledge of sensitive and specific clinical signs, is paramount for an accurate and timely diagnosis. A thorough physical exam, including determination of the IEI, is crucial in the early assessment of a patient with concern for a vascular extremity injury. Adequate training of emerging general surgeon in recognition of vascular injury and its adequate repair is essential to save life and limb.

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Review Article

Global And Regional Cancer Epidemiology: According To World Cancer Report 2012 And Others.

Mohiuddin Alamgir

ABSTRACT:

The International Agency on Cancer (IARC) has initiated World Cancer Report 2012 in 2014. The report estimates the worldwide incidence and mortality for 27 major cancers and for all cancers combined for 2012 and is available in the GLOBOCAN series of the International Agency for Research on Cancer. Overall, there were 14.1 million new cases and 8.2 million deaths in 2012. The most commonly diagnosed cancers were lung (1.82 million), breast (1.67 million), and colorectal (1.36 million); the most common causes of cancer death were lung cancer (1.6 million deaths), liver cancer (745,000 deaths), and stomach cancer (723,000 deaths). In Pakistan, there are over 1.4 million cancer patients. Annually there are 139,200 new cancer cases and 101,600 deaths. Incidences of cancers are different in different parts of Pakistan as depicted by reports generated by two major cancer registries in the country.

Keywords: GLOBOCAN, incidence, cancer, global estimates, mortality.

INTRODUCTION:

The world body for cancer estimation (International Agency for Research on Cancer, IARC) has initiated the World Cancer Report 2012 in 2014. The report estimates the global incidence and mortality for 27 major cancers and for all cancers combined for the year 2012 and is accessible at the GLOBOCAN series of the IARC. According to this report there were on the whole 14.1 million new cases of cancer and 8.2 million deaths in 2012. In order of frequency those were of lung (1.82 million), breast (1.67 million), and colorectal (1.36 million), respectively. Highest cancer mortality belonged to the lung cancer (1.6 million deaths), liver cancer (745,000 deaths), and stomach cancer (723,000 deaths), respectively[1]. In Pakistan, although there is no centralized data for cancer incidence in its population, there exist various hospital-based cancer registries. Data published by these registries show frequencies of different cancers treated at these facilities. This gives us some idea about the cancer status in Pakistan despite variation from region to region.

METHODOLOGY:

Search engine of Google was utilized with various keywords and phrases to search articles related to worldwide cancer epidemiology. Keywords and phrases such as cancer incidence, cancer mortality, global cancer prevalence, world cancer report, Globocan etc., were used. A total of 40 articles including successive world cancer reports, reviews, original articles and textbooks were selected. However, the major content of this review is based on the fifth version of GLOBOCAN and its sources for estimating cancer incidence and mortality for 2012 in 184 countries. The same can be accessed via the GLOBOCAN homepage (http://globocan.iarc.fr).

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LITERATURE REVIEW:

The IARC data and its sources were reviewed and are briefly described here. The data covered global incidences and mortality for 27 common cancers for the year 2012 in world continents and regions[1-7].

Cancer is a grave and mounting problem in many parts of the globe, a fact that has been reflected by successive world cancer reports and other epidemiological studies[8-19]. IARC, the committed cancer agency of the World Health Organization, has initiated the World Cancer Report 2012

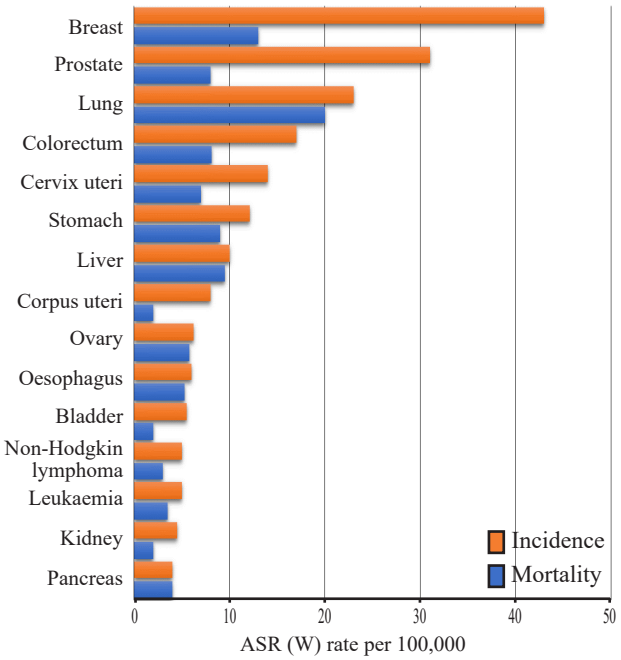

Figure 1. Estimated ASRs for incidence and mortality rates: male/ female combine
[Source: Adapted and Modified from World Cancer Report 2012]

on 3rd February 2014. This was the work of over 250 chief scientists from more than forty countries unfolding multiple features of cancer research and control[1]. According to this report the world cancer incidence rose to 14 million cases. This number is likely to rise to an annual 19.3 million by 2025. Over the same period, cancer deaths are anticipated to go up from an estimated 8.2 million to 13 million annually. The world's most frequent cancer was the lung cancer (13% of total cancers). Breast cancer occupied the second position among all cancers at 11.9% only to be followed by colorectal cancer at 9.7% and prostate cancer at 7.9% Fig.1[1,20,21].

In men most frequent cancers included lung cancer (16.7%), prostate cancer (15%) and colorectal carcinoma (10%). In women the commonest was the breast cancer (25.5%), trailed by those of colorectum (9.2%) and lung (8.7%). Age-standardized incidence rates (ASRs) per 100,000 of population, when considered for both genders combine, were topped by breast cancer at 43.1 followed by prostate at 30.7 and lung[1].

The rank-wise distribution of the 15 most frequent cancers are shown for males (Figure 2a) and females (Figure 2b) in more developed and underdeveloped areas of the world. In men overall the most common cancer is that of lung but the same cancer stands as second in more developed countries being preceded by prostate cancer. Cancers of lung, liver and stomach represent 40% of new cancers and 48% of

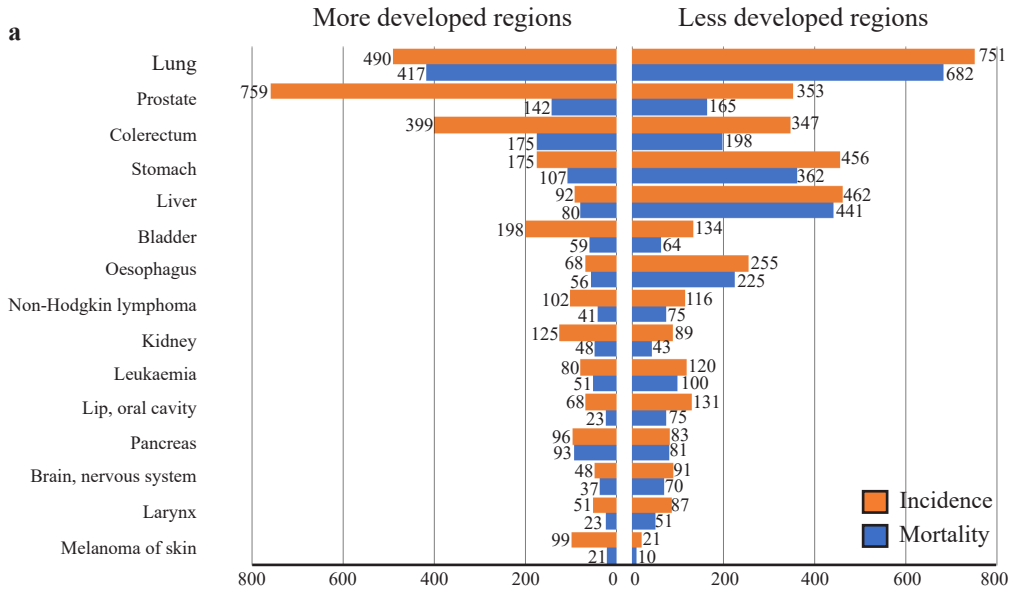

Figure 2a. Estimated cancer incidence and mortality in men [Reproduced from Ferlay et al., 2015].

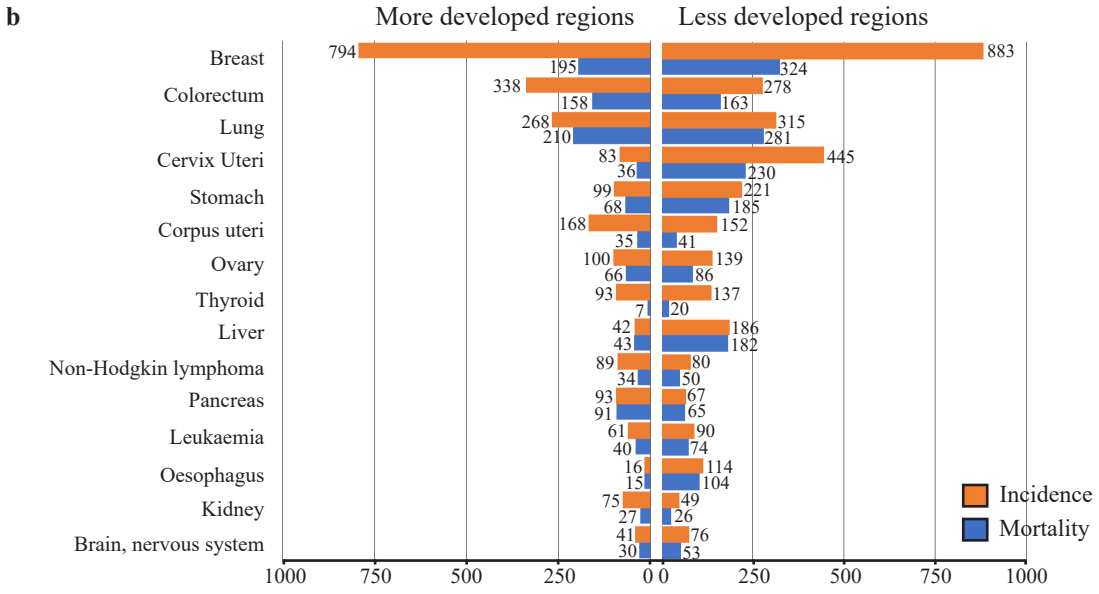

Figure 2b. Estimated cancer incidence and mortality in women [Reproduced from Ferlay J et al., 2015].

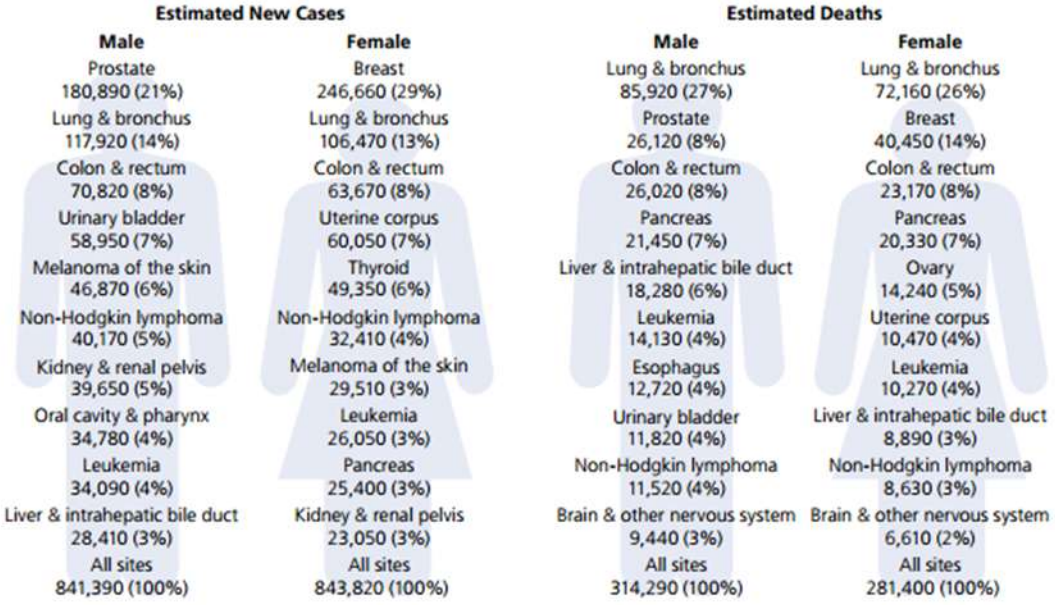

Figure 3. Predicted new cancer cases and deaths in America for the year 2016 [Source: Adapted from© 2016, American Cancer Society, Inc., Surveillance Research]

cancer deaths among males in less developed countries. Breast cancer is the commonest cancer in women, however, more cases occur in under-developed than developed regions. Similarly, cervical cancer, which is the second most frequent cancer in less developed regions, stands as 11th in developed countries. As far as cancer related deaths in women are concerned, lung cancer tops the list in developed regions while in less developed regions breast cancer leads[1,20-23].

The predicted growth of various cancers is largely based on demographic changes in population and it did not take into account the associated risk factors. If both are considered simultaneously, the world projected number of new cancer cases would be likely to reach up to 25 million by 2025[24].

Cancer Incidence in United States of America (USA)

The American cancer society published in its report the number of new cancer cases and deaths by sex for the year 2016 as shown in figure 3. These estimates were based on 1998-2012 incidence data as reported by various agencies. Lung cancer ranked second amongst both sexes while 224,390 new lung cancer cases were expected in 2016. The same was responsible for more deaths than any other cancer in both genders. Among American women breast cancer was the most frequent cancer which had been projected to be diagnosed in 246,660 women ranking second as a cause of cancer death in women. Adenocarcinoma of prostate gland was expected to be the most common cancer in males, 180,890 new cases were predicted in 2016. For Oro-pharyngeal cancers incidence is twice as high in males as compared to females. 48,330 new cases and 9,570 deaths from these cancers were expected in 2016. Incidence trends for this cancer showed that from 2003 to 2012 the incidence rate among whites increased by 1.3% per year in men while it remained stable in women. This increase has been attributed to cancers of oropharynx, base of the tongue and tonsils that are related to HPV infection[25].

Cancer incidence in Europe

IARC population data sheet for European region shows an estimated 3,714,700 new cases and 1,932,800 deaths occurred in 2012 (figure 4).

ASRs for three most common cancers of breast, colorectum and lung were 66.5, 28.2 and 28.8, respectively. ASRs for three common cancers in men were: prostate (58.5), Lung (46.9) and colorectum (35.6). Mortality figure for same cancers were 11.5, 40.3 and 15.7, respectively. ASRs for three commonest cancers in women were: breast (66.5), colorectum (22.6), lung (14.4) and corresponding mortality rates were 16.0, 9.7 and 11.3 respectively. For lip and oral cavity cancer 45567 (2.3%) cases with an ASR of 7.1 and 18642 deaths (1.7) with an ASR of 2.9 has been reported[7,26].

Cancer incidence in South-East Asia

In South East Asia 1,724,300 new cancer cases and 1,171,300 deaths were recorded. The three most common cancers were breast, cervix uteri and lung having ASRs of 27.8, 20.5 and 10.5, respectively (figure 5).

ASRs for three common cancers in men were: Lung (15.7), lip and oral cavity (8.9), colorectum (8.9), with mortality ASRs of 14.2, 5.7 and 6.3, respectively. ASRs for three commonest cancers in women were: breast (27.8), cervix uteri (20.5), colorectum (6.3) and corresponding mortality ASRs were 12.9, 11.3 and 4.4, respectively[1].

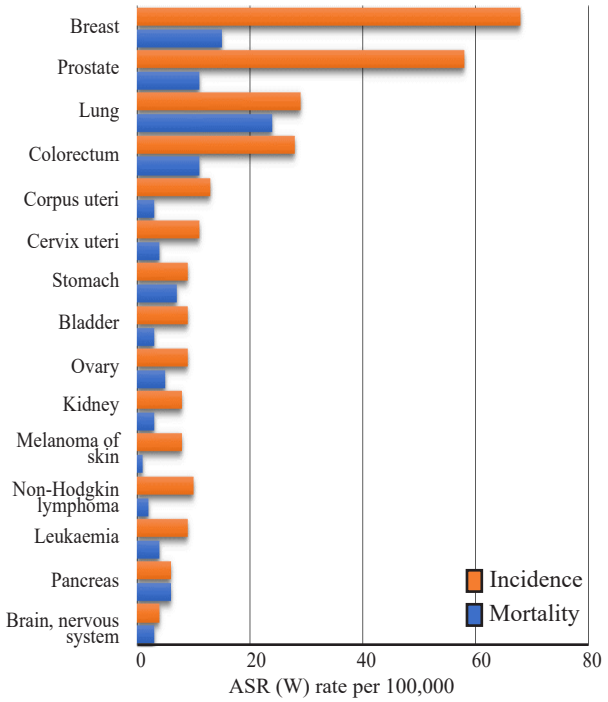

Figure 4. Estimated ASRs for incidence and mortality in Europe: both sexes [Source: Adapted and Modified from World Cancer Report, 2012]

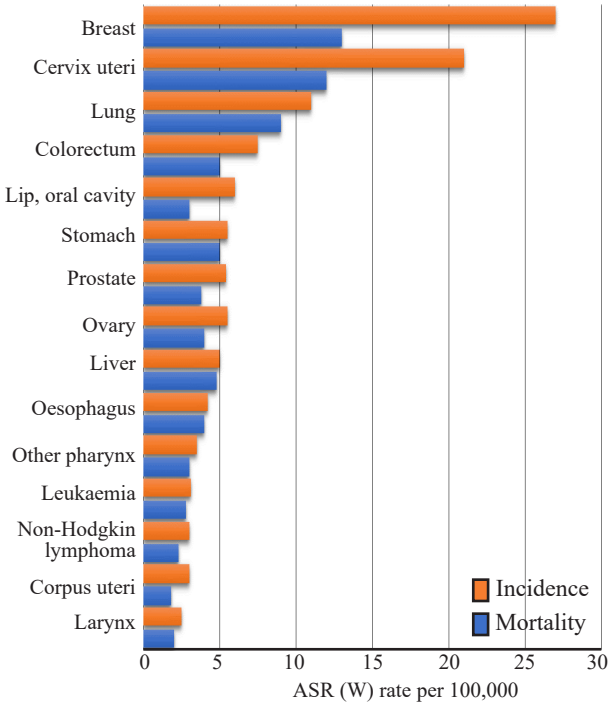

Figure 5. Estimated ASRs for incidence and mortality in South-East Asia: both sexes [Source: Adapted and Modified from World Cancer Report, 2012]

Cancer status in the neighboring countries

In India, having a population of 1.2 billion, approximately one million new cancer patients are registered per year. A substantial proportion of these cancer cases are attributed to avoidable causes like tobacco use, infections etc[27]. Consolidated report of seven population based cancer registries (PBCRs) for the years 2001-2004 reported 89,297 new cancer cases, out of which 44,497 (49.83%) were males and 44,800 (50.16%) were females. Age adjusted rates (AAR) per 100,000 population in males ranged from 43.8 in Barshi to 114.9 in Delhi. Figures 6 & 7 show data reported by cancer registry at dehli in graphical form.

Three leading sites of cancer in males (with their relative proportion and AARs in parentheses) were lung (10.5% and 12.8), larynx (5.9% And 7.5) and tongue (5.4% and 6.5). The leading cancer sites among females (Figure 7) were breast (25.1% and 29.2) followed by cervix uteri (14.9% and 17.6) and ovary (7.2% and 8.0)[28]. Similarly, the cancer registry at Mumbai reported the three leading sites of cancer in males (with their relative proportion and AARs in parentheses) as lung (8.2% and 8.9), mouth (7.7% and 6.9) and larynx (5.8% and 6.2). The leading cancer sites among females were breast (27.5% and 27.5) followed by cervix uteri (13.0% and 13.0) and ovary (7.3% and 7.3)[28].

In the neighboring country of Iran, the reported overall ASRs are 110.43 for men and 98.23 for women. Frequent cancers among males are those of esophagus, stomach, colon-rectum, bladder and leukemia. Cancers of breast, cervix uteri, stomach, esophagus, colon-rectum and are mostly seen in Iranian women[1]. In Iran cancer of stomach is the commonest cancer among males having an ASR 49.1 in certain areas. Adenocarcinoma prostate is the second one with an ASR of 15.6 (Tehran area). Among women, breast cancer is the commonest cancer having an ASR of 23.1.

In Sri Lanka, the top five cancer sites in males with respective ASRs are lip/ oral cavity/ pharynx (16.0), lungs (7.9), esophagus (5.7), colorectum (4.2) and lymphoma (3.9). Similarly in females the common cancers with respective ASRs are breast (20.6), cervix uteri (9.6), thyroid (6.4), ovary (6.7) and esophagus (6.4)[31,32].

Epidemiology of cancer in Pakistan

In Pakistan there are over 1.4 million cancer patients. Each year around 139,000 new cancer cases are reported accounting for 10.73% cancer cases among SAARC countries. Every year reported cancer-related deaths are 101,600 contributing 11.45% to those of SARRC countries[30]. Areas comprising Pakistan revealed variable cancer incidences [33-36]. Shaukat Khanum Memorial Cancer Hospital and Research Centre (SKMCH & RC) based cancer registry accumulated cancer data spread over 18-year duration from 1994 to 2012 (Table 1) [33]. In total 58,761 tumors including 55,974 malignant tumors were documented. In adults common malignancies

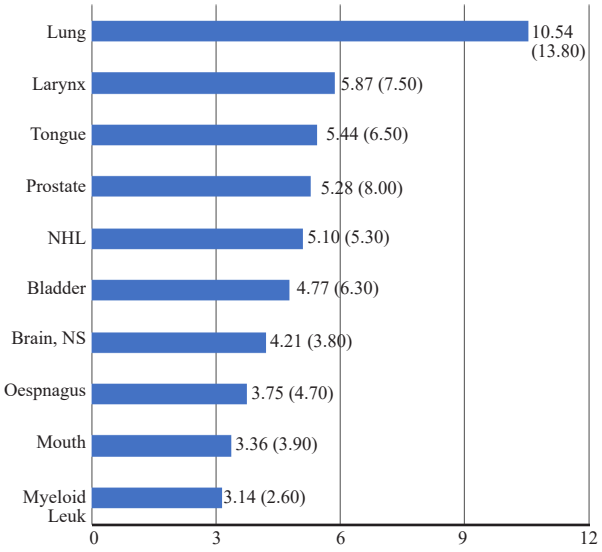

Figure 6. Leading cancer sites in males – Delhi (2001-2003) with age adjusted rates in parentheses [Source: Adapted and Modified from "Consolidated report of population based cancer registries 2001-2004"].

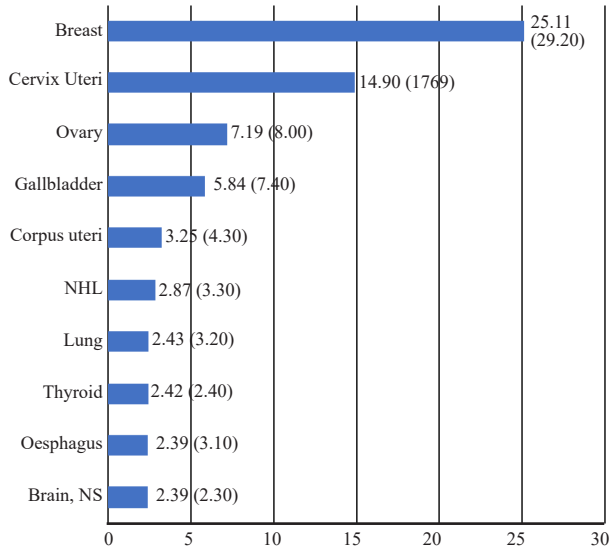

Figure 7. Leading cancer sites in females – Delhi (2001-2003) with ASRs [Source: Adapted and Modified from "Consolidated report of population based cancer registries 2001-2004"]

Top 3 malignancies	1-Count (%)	2-Count (%)	3-Count (%)	Total
All age-groups, both male/female combined	Ca breast 11,853 (21.18%)	Leukemia 3,368 (6.02%)	Lip & Oral cavity 3.336 (5.96%)	55,974
Adults (>18 years)	Ca breast 11,848 (23.81%)	Lip & Oral cavity 3,291 (6.61%)	Liver/intrahepatic bile ducts 2,836 (5.70%)	49,765
Adult males (>18 years)	Liver/intrahepatic bile ducts 2,076 (8.66%)	Lip & Oral cavity 2,047 (8.54%)	Non- Hodgkin's lymphoma 1,779 (7.42%)	23,971
Adult females (>18 years)	Ca breast 11,726 (45.46%)	Ovary & uterine adnexa 1,524 (5.91%)	Lip & Oral cavity 1,244 (4.82%)	25,794
Children (<18 years)	Acute lymphoblastric leukemia 1,345 (21.66%)	Hodgkin's lymphoma 1,099 (17.70%)	Non-Hodgkin's lymphoma 694 (11.18%)	6,209

Table 1. Common three malignancies among both genders for the period 1994-2012 at SKMCH & RC [Source: Modified and adapted from Badar and Mahmood, 2015]

were those of breast, lip, oral cavity, liver and intra-hepatic bile ducts, respectively. In adult males, in order of frequency common cancers were of liver/intrahepatic bile ducts, lip, oral cavity and Non-Hodgkin's lymphoma. Among adult females cancers of breast, ovary/ uterine adnexa, lip and oral cavity were common[33].

Karachi Cancer Registry (KCR) registered cancers in Karachi South district for 1995 to 1997. ASRs of 139.11 and 169.5 per 100,000 were reported in males and females, respectively. Mean ages for males and females for all cancers were 51.2 years/ 50.0 years, respectively. In men ASRs for cancers of lung, oral cavity, urinary bladder and larynx were 21.3, 14.2, 9.0 and 8.8, respectively. In females reported ASRs cancers of breast, oral cavity and ovary were 53.1, 14.5 and 10.9, respectively. Similarly, ASRs for overall cancers registered between 1998 and 2000 were 179.0/100000 and 204.1/100000 for males and females. Mean ages for males and females for all cancers were 49.5 and 53.7 years, respectively. For this period, reported ASRs in males for cancers of lung, larynx and urinary bladder were 25.5, 11.8 and 9.9, respectively. ASRs in women for cancers of breast, oesophagus and cervix were 69.1, 8.6 and 8.6, respectively[37,38,39].

The Karachi Institute of Radiotherapy and Nuclear Medicine (KIRAN) is a cancer treatment facility that caters for patients from a large area of Sindh province in Pakistan. The cancer registry placed at KIRAN published malignancies reported between 2000 to 2008 (18,351 cases for 9-year-period). In male patients proportion of reported malignancies was: head and neck (32.6%), gastrointestinal tract (6.9%) and

lymphomas (6.1%). In females: breast cancer (38.2%), head and neck cancer (15.1%) and cervical cancer (5.5%)[8]. Another hospital-based-registry at Aga Khan University Hospital (AHUH) has published retrospective data for 1989 to 1992. They reported 2632 malignant cases. Out of these common cancers in males were those of lung (15.2%), head and neck (10.6%) and lymphoma (10.2%). In females, in order of frequency breast cancer (32.5%), ovarian cancer (7.9%) and cancer of gall bladder (7.7%) were found to be common malignancies[40].

CONCLUSION:

Cancers are the leading cause of death in technologically advanced countries while concomitant with economic development have been acquiring the status of a major public health problem in developing countries. This disease has assumed the status of the second commonest cause of death due to non-communicable diseases in developing countries like Pakistan. Review of current and old cancer epidemiological data proves that in future a definitive majority of all new cancer cases will occur in those countries that come under low and middle income category of WHO classification.

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Review Article

Configuration of Circle of Willis and Its Clinical Significance

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ABSTRACT:

In occlusive vascular brain diseases, the structure of the circle of Willis is of immense importance. A high percentage of variations have been reported in the arteries forming circle of Willis. These have profound clinical implications. With advances in interventional radiological procedures, the interventional radiologists and neurosurgeons need to have thorough knowledge of these variations. This article will help readers understand the significance of anatomical variations and their clinical effects.

Key words: Circle of Willis, Anatomical variations, cerebral arteries

INTRODUCTION:

Cerebrovascular diseases present one of the leading problems of the modern medicine. Besides having a high mortality rate, these cause a high level of disability in those who survive a cerebrovascular accident. Cerebral perfusion depends on the status of the cerebral vessels as well as on the variations shown by these vessels, thus making it important to emphasize on these variations. As these variations are common they may have intense clinical implications[1].

Accurate knowledge of intracranial vascular anatomy is increasingly gaining importance with advances in neurosurgeries and radiological neurointerventions[2]. The pathologies of arteries at the base of brain can thus be tackled more effectively. In case of internal carotid artery occlusion, it is the arteries in the circle of Willis that serves as a major collateral channel but the size and patency of these arteries are variable[3].

The circle of Willis (CoW) is considered as major anastomosing channel which maintains ample cerebral blood flow[4]. In case of cerebral occlusion, morphology, size and presence of the contributing vessels influence its ability to redistribute blood flow[5].

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Cerebral vascular structures show numerous variations. Radiological recognization of these variations are essential in diagnosis, treatment and for safe performance of neurosurgical and interventional radiological procedures[6].

LITERATURE REVIEW:

Blood supply to brain is via paired internal carotid and vertebral arteries that anastomose at the base of the brain to form arterial ring called “the Circle of Willis”. It is named after Dr. Thomas Willis who first accurately described its anatomical and physiological significance. It is located in the subarachnoid space within the interpeduncular fossa[7]. The internal carotid artery branches to give off paired anterior cerebral arteries. The right and left anterior cerebral arteries (ACA) communicates to each other via anterior communicating artery (AComA) supplying the forebrain and constitutes the anterior circulation[8].

The two vertebral arteries joins at the mid medullary level to form single large median artery called basilar artery runs in the basilar groove of Pons and ends by dividing into terminal branch the right and left posterior cerebral artery (PCA) thereby constituting the posterior circulation supplying the hindbrain.

The anterior and posterior circulations communicate with each other via the posterior communicating artery(PComA)

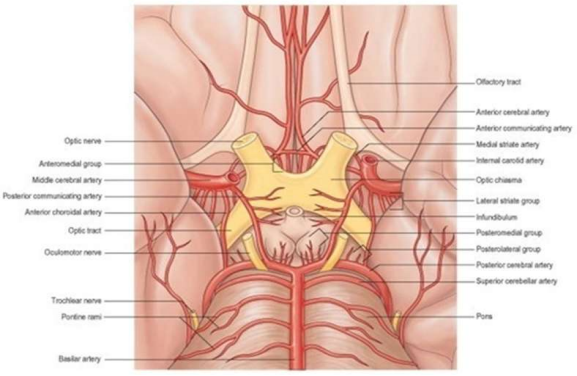

Figure 1: Circulus arteriousus showing formation of Circle of Willis and its different branches[9]

which is a branch of internal carotid artery thereby completing the arterial ring as shown in figure 1[10].

Surgically the posterior cerebral artery is divided into two parts: Pre communicating part (P1) –proximal portion of PCA where it originates from the basilar artery till it joins the PComA. Post communicating part (P2) – course distal to the junction with the posterior communicating artery[11].

The cerebral arterial circle of Willis pattern is considered classical text book type if all the component vessels (anterior and posterior cerebral arteries and anterior and posterior communicating arteries) are present; they are not duplicated or absent, contributing vessels arise from their typical source and their diameter is not less than 1 mm[12].

Development of Circle of Willis:

During intrauterine life developmental variations in the circle of Willis may be encountered[13]. The first stage at which variations can occur during embryogenesis is angiogenesis. As these cerebral arteries continue to develop anatomical variations occur that may affect arterial diseases in later life. The first artery to develop is the internal carotid artery at day 24 of embryonic life; providing blood to the primitive brain. As brain growth progresses, the brainstem and cerebellum enlarge; blood supply from the internal carotid artery becomes scanty, bringing about the development of the posterior circulation[14]. Internal carotid artery divides into anterior, middle and posterior cerebral artery. The posterior cerebral artery joins the basilar artery.

Posterior circulation begins to start consisting of primitive arterial branches originating mainly from proximal carotid-vertebrobasilar anastomosis and from distal carotid artery. The proximal portion of the posterior cerebral artery decreases in luminal caliber because of the hemodynamic stress and it is now called as posterior communicating artery (PComA) the distal portion of the PCA connects with the basilar artery hence the PComA becomes branch of ICA wheras the PCA becomes the branch of basilar artery.When the vertebral and basilar arteries fully develops and become independent from the internal carotid artery the carotid-vertebrobasilar anastomosis regresses forming two separate systems.The carotid system supplying forebrain and the vertebral system supplying the hind brain[15]. During these embryological stages multiple events occur that lead to the formation of anatomical variants.

Variants of arteries of circle of willis

Data from previous anatomical and radiological studies have shown that more than 50% of healthy subjects have anatomical variations and prevalence of an entire complete circle is 21 to 42%[16]. Typical configuration of CoW may show variations. Caliber of the vessels may vary often they are fenestrated, duplicated, triplicated, , hypoplastic or even aplastic as shown in figure 2. Vessels having luminal diameter less than 1mm are considered to be hypoplastic[17].

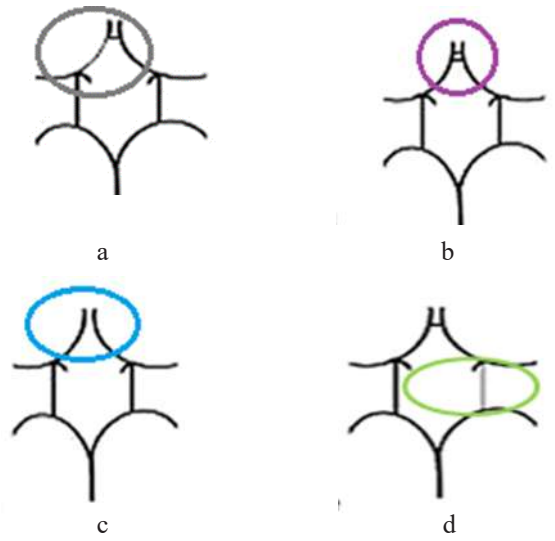

Figure 2: Schematic diagram showing the variations in the circle of Willis,
(a) Hypoplastic ACA. (b) Double ACoA. (c) Absent AcomA. (d) Hypoplastic PComA

Padget in 1984 divided the Circle of Willis into three configurations according to diameters of posterior cerebral artery (PCA) and posterior communicating artery (PComA): fetal, Adult and transitional. In fetal configuration, the diameter of PComA is greater than the diameter of P1 segment of PCA. Hence, the occipital lobes are supplied largely through the internal carotid arteries. In the adult configuration, PComA has smaller luminal diameter than the P1 that's why the blood supply to the occipital lobes is mainly via the vertebrobasilar system. In transitional configuration, PComA is equal in diameter to the P1 segment of the PCA. Such type of anatomical variations are important clinically as in atherosclerotic lesion of internal carotid arteries thrombus arising from atheromatous plaque may dislocate into posterior cerebral artery via the larger diameter of posterior communicating artery[19].

Clinical significance of variants of cow

For establishment of better collateral circulation through CoW, acquaintance between the two sides of the circle of Willis as well as link between the internal carotid and vertebrobasilar systems are equally important[20,21].

PComA and AComA play an important role if one of these arteries is thin/thread like. In such cases, collateral circulation through the circle may be impaired. Absence or hypoplasia of PComA is a known risk factor for cerebrovascular conditions such as ICA occlusion, minor strokes, border zone infarcts, transient ischemic attacks due to restricted collateral flow[22]. In absence of ICA occlusion, one of the contributing risk factor for ischemic stroke is PCA hypoplasia[23]. In case of ICA occlusion, hypoplastic PComA may be a risk factor for developing neurological de?cit[24].

In case of thromboembolic disease hypoplasia of anterior

cerebral arteries results in decreased collateral supply resulting in increased risk of infarction[25]. Miyazawa et al in 2011 suggested that incomplete anterior part of CoW (absent AComA, Hypoplastic or aplastic ACA)results in lacunaes in basal ganglia leading to lacunar stroke[26].

Many studies have documented association between cerebral aneurysm and variations in the arterial circle[27]. In diagnosis and management of cerebrovascular accidents, TIA and hemorrhagic stroke awareness about these variations like duplications, triplication, fenestrations and fetal arteries plays a critical role and may help in surgical planning[28,29].

A classical text book type of circulus arteriosus is bilaterally symmetrical arterial polygonal ring providing important collateral pathway to maintain blood flow to the brain tissues in case of vessel occlusion[30]. Anatomical variations are possibly determined genetically, develop during intrauterine life and persist even after birth[31]. There is a large variety of configurations of the CoW among both normal and diseased populations in different ethnic groups[32].

Previous data reported that the anterior circulation was complete in 68% and the posterior circulation was complete in 38% of cases[33]. Different studies put the occurrence of normal circle of Willis in the range between 28 to 52% in different populations[34,35]. A study conducted by Sande et al suggested that variations are common in posterior part of CoW (43 %) than in anterior part (16 %)[36].

Variations in the morphology of the circulus arteriosus alter the severity of symptoms of cerebrovascular diseases like stroke, aneurysms, infarcts and other vascular malformations. Clinically important association have been noticed between intracranial aneurysm and fenestration[37]. The framework of the circle of Willis becomes important in ascertaining the effectiveness of the circulation of brain in surgeries like aneurysm coiling AVM embolisation, and also internal carotid artery ligation[38]. The absence of some CoW elements may be fatal for patients with internal carotid artery stenosis[39]. Anatomical arrangement of the arteries in CoW plays a major role in the development of and its corrective surgery[40]. Persons with efficient collateral circulation have a lower risk of transient ischemic attack and stroke[41].

CONCLUSION:

Knowledge of variations in cerebral arterial circle is useful for various interventional radiological and surgical procedures. In patients undergoing cerebral surgery, a pre-operative examination of the structure and variations of the Circle of Willis through easily accessible and non-invasive techniques will decrease the potentially significant neurological complications and associated secondary risks of morbidity and mortality.

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Case Report

Kartagener's Syndrome Presenting As Bilateral Recurrent Nasal Polyposis In A Young Boy

Zeba Ahmed, Warda Waseem, Uroosa Saman

ABSTRACT:

Kartagener's syndrome is a very rare congenital disease consists of a classic triad, sinusitis, situs inversus and bronchiectasis. Approximately one half of patients with primary ciliary dyskinesia have situs inversus and Kartagener syndrome. We are presenting a case of Kartagener's syndrome in a 10-year-old boy presented with chronic sinusitis leading to bilateral multiple nasal polyposis. He also had situs inversus and chronic bronchiectasis. He had undergone surgery two years back for nasal polyposis but now again presenting as recurrent nasal polyposis. In order to prevent the dreadful complications correct diagnosis in early life is very important in such patients.

Keywords: sinusitis, primary ciliary dyskinesia, Kartagener's syndrome, situs inversus Bronchiectasis

INTRODUCTION:

Kartagener syndrome (KS) is an inherited autosomal recessive disorder. It causes defects in the action of ciliary movement, comprises of triad sinusitis, situs inversus and bronchiectasis. It was first described by Siewert1 and recognized as a congenital syndrome by Manes Kartagener in 1933[2].These patients usually present with recurrent respiratory infections and infertility in adulthood. Prevalence of Kartagener syndrome is 1;20,000 - 1:30,000[3]. We are presenting a case of Kartagener's syndrome in a 10 years old boy presented with chronic sinusitis leading to bilateral multiple nasal polyposis.

CASE REPORT:

A 10-year-old boy presented in outpatient department of Civil Hospital Karachi with bilateral nasal obstruction, rhinorrhea, sneezing, post-nasal dripping off and on since childhood. There was also impaired sense of smell and mild hearing loss on left side. There was no history of allergy, sleep apnea and weight loss but there was a history of fever, cough and recurrent chest infections in past. He also had history of surgical operation for nasal polyposis 2 years back.

On examination, he was a young boy of average built and height, afebrile, conscious and well oriented with no signs of pallor, icterus, cyanosis, clubbing, edema and raised JVP. Bilateral cervical lymph nodes were not palpable. While examining the nose, no obvious external nasal deformity was observed but there was slight widening of the nasal bridge (fig. 1). Anterior rhinoscopy showed bilateral, multiple, glistening, polypoidal masses in the nasal cavity, which do not bleed on touch. Nasal patency was almost absent on both sides with loss of sense of smell. Oral and ear examination was insignificant except some retraction of the tympanic membrane on the left side. On chest auscultation, there was no added sound on both sides. Heart sound could not appreciate on left side but rather present on the right side, with apex beat was palpable on 5th right inter coastal space. Rest of the examination was insignificant.

Plain x-ray of the nose and paranasal sinuses (Water's view) was done showing soft tissue opacity in both nasal cavities, maxillary sinuses, frontal sinuses and sphenoid sinuses on both sides (fig. 2). Plain x-ray chest (PA view) was done showing dextrocardia and bronchiectasis changes in both the lungs (fig. 3). CT scan of the nose and paranasal sinuses with contrast was done which revealed bilateral nasal polyposis along with moderate enlargement of the adenoids and some deviated nasal septum (fig 3 and 4). Ultrasonography of the whole abdomen was done which confirmed situs inversus and left kidney was distorted and shows loss of cortico-medullay junction and hydronephrosis. Pure tone audiogram showed mild conductive deafness in the left ear with normal hearing in the right ear and tympanogram showed type C curve on the left side and type A curve on the right side. Hematological investigations showed hemoglobin 10.5 gm/dl, total leucocyte count of 9.5 x 10^3/ml and slightly raise platelet count of 529 x 10^3/ml. Erythrocyte sedimentation rate (ESR) and serum electrolytes were also normal in range. Sweat test for chloride was also undertaken to rule out cystic fibrosis and it was negative.We planned surgical treatment for the recurrent nasal polyposis and endoscopic sinus surgery was performed bilaterally. Multiple nasal polypi were noticed bilaterally in the nasal cavity, maxillary, ethmoidal, frontal and sphenoidal sinuses along with frank pus at the antrum of left maxillary sinus which was removed. As it was the revision surgery on this patient, most of the land mark were not identifiable. After

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surgery he was advised for influenza vaccine and discharged on antibiotics, antihistamine and nasal decongest and steroidal sprays and called for regular follow up in ENT OPD. He was also referred to nephrology department for kidney related issue. During the follow-up period of 8 months, patient was alright regarding his nasal problem.

DISCUSSION:

Primary ciliary dyskinesia (PCD), also called as immotile ciliary syndrome or Kartagener's syndrome is a rare, ciliopathic autosomal recessive genetic disorder that causes defects in the action of cilia lining of the respiratory tract (both lower and upper, including sinuses, Eustachian tube and middle ear), fallopian tubes in female, and flagella of the sperm in the males[4]. It is defined as the combination of sinusitis, *situs inversus*, bronchiectasis and otitis media. Pseudostratified ciliated columnar cells that line the nasopharynx, middle ear, paranasal sinuses, larynx, trachea

Fig. 1 Patient with Kartagener's Syndrome (Reproduced with written permission of the patient's parents)

Fig.2 Plain X ray of the nose and PNS showing opacities in bilateral nasal cavity and sinuses

Fig.3 X Ray Chest P.A view showing cardiac shadow on the right side and bronchiectasis changes in the lungs

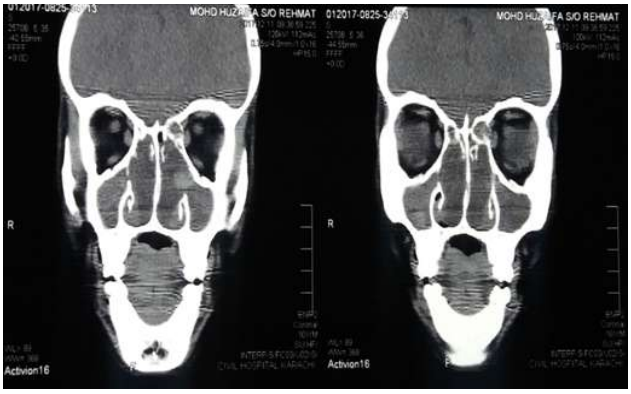

Fig.4 CT Scan of the Nose and PNS coronal view showing homogenous opacities in the nasal cavities and maxillary sinuses on both sides.

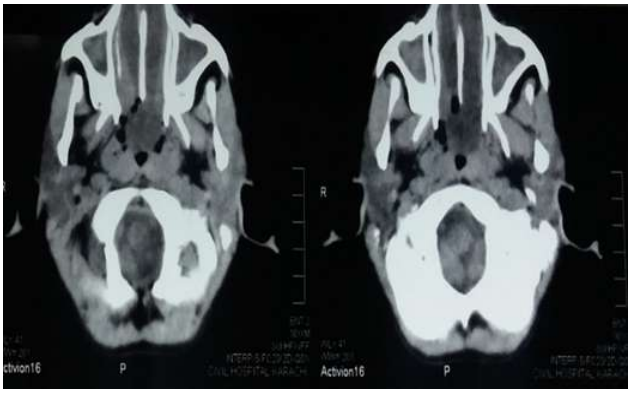

Fig.5 CT Scan of the nose and PNS in axial view showing similar findings

and bronchi are affected. Functional disturbance of the muco-ciliary clearance due to uncoordinated and ineffective ciliary movement can progress to long standing sino-nasal, aural, and pulmonary problems. More than 200 proteins and polypeptides are engaged in ciliary formation[5]. Any abnormality involving these structures may impair ciliary function.

PCD is a genetically heterogenous disorder affecting motile cilia which are made up of approximately 250 protein[6]. Around 90% of individuals with PCD have ultrastructural defects affecting proteins in the outer and/or inner dynein arm which give cilia their motility ,with roughly 38% of these defects caused by mutations on two genes DNAI1 and DNAH5, both of which code for protein found in outer ciliary dynein arm[7].

Clinical signs and symptoms can be tracked back to early childhood. There is usually a wide range of defects in ciliary ultrastructure and motility which impairs muco-ciliary clearance and thus causes sinopulmonary symptoms with differing severity. Nasal manifestations are chronic rhinitis or sinusitis and nasal polyposis, nasal obstruction and rhinorrhea. Sinusitis in Kartagener's syndrome is the least characteristic feature and can coexist with the absence or hypoplasia of one or more sinuses, nasal polyposis or sinus infection[8]. Ear problems includes otitis media with effusion, and recurrent otitis media. Chronic productive cough and recurrent pulmonary infections are the usual chest complaints. Hemoptysis may also be present. Dyspnea or wheezing usually indicates either widespread bronchiectasis changes or underlying chronic obstructive pulmonary disease.

Normal ciliary beating is also necessary for visceral rotation and orientation during embryonic development. Patients with KS may have either situs solitus i.e., dextrocardia only or situs inversus totalis, where all the visceral structures are on the opposite side[9]. Delay in diagnosis leads to progression of KS with complications i.e. bronchiectasis, pulmonary fibrosis, and finally impaired lung and heart function[10]. KS is often diagnosed incidentally on routine radiological examination, of chest X-ray that shows dextrocardia and situs inversus is on routine checkup. Computed Tomography (CT) of thorax, further shows malrotation or bronchiectasis changes and ultra-sonogram of abdomen reveal situs inversus totalis. CT of paranasal sinuses defines pan-sinusitis, polyposis or hypoplasia of sinuses helping in early diagnosis of disease. Audiometry and tympanometry aid in identifying conductive hearing loss and presence of fluid in the middle ear. Spirometry studies help to evaluate the severity of pulmonary involvement. Semen analysis for sperm motility and ultra-structure is helpful regarding fertility issues. Male patients with KS invariably are infertile, whereas females usually have reduced fertility[11]. Due to the absence of microscopic facility at every hospital, leaves the diagnosis to be made exclusively on clinical examination accompanied with imaging studies.

Anticipated treatment is required to relieve symptoms and to avoid irreversible complications. It comprises of medication, surgery, and some adjuvant therapies. For acute bacterial exacerbations and prophylaxis, antibiotics are indicated. Bronchodilators, inhaled corticosteroids, mucolytic agents, pneumococcal and influenza immunization and chest physiotherapy and positive expiratory pressure devices are recommended and are beneficial. Surgical treatment like functional endoscopic sinus surgery (FESS) is helpful in patients with nasal polyposis and chronic rhino sinusitis. A consistent postoperative follow is very important in preventing recurrence of disease and to reduce morbidities due to retained secretions, impaired muco-ciliary clearance and susceptibility to chronic recurrent airway infections. Lobectomy and pneumonectomy are recommended for localized lung damage with recurrent hemoptysis or respiratory exacerbations. Infertile patients can be treated by advanced micromanipulation techniques and by in vitro fertilization techniques[12]. Genetic testing carries the immense future potential for developing gene therapy and genetic counselling.

CONCLUSION:

Kartagener's syndrome is a very rare condition. Clinical follow-up at regular intervals is very important in these patients to prevent complications. It may exhibit variable and atypical clinical presentations and severity due to its multi-system involvement and reverse positioning of internal organs.

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Needle Stick And Sharp Related Injuries- Ethical Considerations, Prevention, And Management

Faisal Hanif, Umar Khurshid, Haroon Sabir Khan, Muhammad Zill-e-Humayun Mirza

Laboratory and Health care workers (HCW) are exposed to many occupational related hazards. Both are at considerable risk of acquiring infections. Needle stick/prick injuries (NSIs) can lead to blood borne infections such as HIV, Hepatitis B and Hepatitis C. NSIs are one of the most common biological hazards inside laboratory. These injuries can be sustained while handling a sharp or needle and more commonly during recapping and waste disposal. Risk of transmission after these injuries from infected patients to HCW are 3-30% for hepatitis B, 3% for hepatitis C, and 0.3% for HIV[1].

It is pertinent to mention that frequency of needle stick injuries is highest among nursing staff as reported by many published studies[2]. Most common causes of injury among indoor hospital patients is phlebotomy or intravenous infusions. Still the exact magnitude of NSI in Pakistan is not clear because of poor or almost no reporting, surveillance system exist[2,3].

Needle stick injuries (NSI) are responsible mainly for the transmission of blood related diseases. Hospital staff including doctors, nurses, and paramedics are at highest risk of such injuries. It is said that almost one half of the intravenous infusions in our region are hazardous not only for patients but also for health care provider. Recapping of syringe after use has been considered as the most frequent factor responsible for NSI although there are different causes of needle stick injuries. Accidental pricks in such cases are more likely to be by used infected needle; therefore, they are at considerable risk of acquiring such infections. In Pakistan, hepatitis B and C are the two main infectious diseases that can be transmitted through prick of infected needles and probability of hepatitis B transmission is 3-30%[4].

It is estimated that performing phlebotomy to draw blood for laboratory investigations is the most common cause of needle stick injury in hospital wards[5].

Ethical considerations in Needle stick injuries:

Apart from the academic and case management point of view; one pertinent aspect remains the non-presence of an explicit occupational exposure law dealing with such issues. The situation is complicated even further when it is analyzed that any post-exposure prophylaxis (PEP) rests on the presence or absence of the infecting agent in the source patient. Consider a situation in which the source patient or the attendants are unwilling to get the test done. Would it be ethical enough to perform an unconsented test on the individual's previously held samples? This, at times, may create an ethical issue – a right of the source patient to choose or decline a medical advice and the right of the health care worker in perusing a logical and recommended course of PEP after the source patient's status is ascertained. Realistically both the involved parties have stakes, risks and fears that need to be timely and elaborately addressed and discussed.

Most patients are happy to give permission for their blood to be tested but few refuses. It is because of the fears about its implications on jobs, health insurance and least but not the last they are afraid of social stigma and discrimination [6].

The complexity is not only of getting an informed consent; it's also because of the fact that asymptomatic carriage of infections is common. A quarter of HIV infected patients don't know about their disease and 26% of people cannot identify any particular risk factor. Any positive test on an unconsented sample is going to be followed by certain reactions. Revealing such a positive status to an individual may potentially make the patient liable to severe psychological stress apart from the social and physical effects this disclosure is going to have on them. The patient may perceive it as a violation of privacy and autonomy; fears of social stigma, tainted repute and social discrimination are well found concerns of the patient[7]. The resulting anxiety, of an unprepared mind, may even lead to distrust between the caregivers and the patient - a medical care avoiding behavior- none serving the interests of the patient or the people around the patient, initiate protective behavior in the source patient in which epidemiologically relevant information may be concealed and distorted – none helping the public health staff.

Whatever course of discussion is adapted and whatever course of ethical theories, be it the deontological approach or the utilitarian approach, be debated, the health care provider has to weigh the harms and benefits to both the source patient and the health care worker who by now has become a patient too.

Even in the West the opinion remains divided on the legality

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of unconsented testing in such circumstances. Law in the US is divided with some states mandating unconsented testing while others restricting such use[8]. General Medical Council in the UK also favours the second option. For us the quagmire is complex, with no relevant laws on the subject issue. However following are suggested to tackle the situation at hand.

1. All efforts can be made to explain the purpose, risks and benefits of the particular test. This can be preferably done by the health care provider supposed to treat the exposed patient. In situations where the patient is unwilling for consent the applicability of unconsented testing of any retained sample be explained to the patient.
2. If after all the deliberation the patient remains unconvinced – permission be granted for the unconsented sample testing. The authority conceding such test has to be identified and procedure for the documentation of such an event be devised. Feedback of the tested sample to the patient remains the right of the source patient who will be asked how to get informed of the results. Proper protocols to be made in facilities which embark upon the testing of unconsented testing.
3. When unconsented specimen is tested patient confidentiality has to be respected.
4. Is it ethical to allow Health care worker (doctors, nurses and paramedics) to work with sharps/needles without proper training to prevent sharp related injuries. Training on Universal Precaution Guidelines, protocols regarding post-exposure prophylaxis, and safety devices has to be provided to prevent such injuries among Health care workers.

Needle Stick Injury Protocol

In the following section we will discuss about the protocol to be followed after needle stick injury. [1,9,10]

Immediate care (On spot)

1. First step is to wash injured part with tap water and soap
2. If there is any exposure to mucosa like eyes, or if the wound size is large, irrigation with plentiful amounts of normal saline.
3. Use of bleach or antiseptics to clean area will not help.

Hospital Care at emergency department

1. First step is to irrigate and clean the wound.
2. Risk assessment of the patient
3. Next step is to assess if tetanus and/or hepatitis B prophylaxis is required or not. Health care staff are mostly vaccinated against hepatitis B.
4. It is the responsibility of employers to ensure that all vaccines and post exposure prophylaxis remain available to the employee at all time and at a reasonable location and at no cost.

Prophylaxis for HIV with three-step risk assessment approach

Assess necessity for anti-retrovirals based on an assessment of the risk by using the three-step approach as developed by the Center for Disease Control and Prevention (CDC).

Step 1: Determine exposure code

1. Do not panic and immediately expose and express the wound and encourage oozing of blood. Next inquire about the source material, it might be blood, body fluid or any potentially infectious material. If none of above, there is no risk of HIV transmission. If yes than what type of exposure has occurred
2. If the skin is intact and there is no visible injury, there is no risk of HIV transmission.
3. If the mucous membrane was exposed and the volume of fluid few drops, several drops or major splash? If few drops, the category is exposure code one. If several drops or major splash, the category becomes exposure code two.
4. Now if the contact was percutaneous and there was needle injury, the category is exposure code two.
5. If it was from a large-bore hollow needle, the category is exposure code three.

Step 2: Determine HIV status code

1. If the exposure source is HIV negative, no post exposure prophylaxis is required but if HIV positive, we have to check about low titer or high titer.
2. Low-titer exposures are asymptomatic patients with high CD4 counts: These can be placed in HIV status code one. High-titer exposures are patients with primary HIV infection having low CD4 counts. These are labelled as HIV status code two.
3. If HIV status is unknown or the source is unknown, the HIV status code is also unknown.

Step 3: Match exposure code with HIV status code to determine if any post exposure prophylaxis is indicated

Post exposure prophylaxis recommendations are discussed below.

1. Both Exposure and status code one: Post exposure prophylaxis may not require. Exposure type does not pose a known risk. It is a tricky situation. The exposed health care worker and the treating clinician need to decide if the risk for drug toxicity outweighs the benefit of post exposure prophylaxis.
2. Exposure code one and HIV status code two: Consider the basic regimen. Exposure type poses a negligible risk for HIV transmission. Again the exposed health care worker and the treating clinician need to decide if

the risk for drug toxicity outweighs the benefit of post exposure prophylaxis.

3. Exposure code two and HIV status code one: The basic regimen is recommended and the use of post exposure prophylaxis is very much appropriate in this case.
4. Both Exposure and status code two: the expanded regimen is recommended. Here exposure type represents an increased HIV transmission risk to the exposed person.
5. Exposure code three and HIV status code one or two: the expanded regimen is recommended. Here exposure type signifies an increased risk of HIV transmission.
6. HIV status code unknown and exposure code is two or three: If exposure code is high and the source is unknown, post exposure prophylaxis with basic regimen is recommended.

Prophylaxis for Hepatitis B

Hepatitis B prophylaxis measures are as follows:

1. The cases where individuals are previously vaccinated with known and good response to vaccine. No therapy required in all such cases.
2. The cases where individuals previously vaccinated and response to vaccine is not known. In this scenario send fresh blood sample for anti-HBS titer to check previous vaccination response and do administer prophylaxis (one dose of HBIG = 0.06 mL per kg intramuscular); booster dose of vaccination is also required.
3. The cases where individuals are unvaccinated. Immediately inject them with one dose of HBIG and initiate vaccination series for three injections.

There is no known effective post exposure prophylaxis for hepatitis C.

CONCLUSION:

In our setup occupational exposure to blood and body fluids due to needle stick and sharp related injuries is increasing among health care workers. Phlebotomy procedure and recapping of needles after drawing of blood are commonest procedures, leading to needle stick injuries. A system can be designed for initial training of safety precautions. Awareness campaigns regarding hazards of sharps and needle stick injuries can be introduced in hospital settings. Standard operating procedures intended at prevention from such injuries can be framed. There can be a reporting mechanism by introduction of incident reporting forms of all such injuries. HBV vaccine has proven to be highly effective in preventing infection in workers exposed to HBV. To date no vaccine exists to prevent HCV or HIV infection.

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Ethical Aspects of Organ Transplantation

Farhan Muhammad Qureshi

Dear Sir,

Organ transplantation has been a combination of the technical, the practical and the ethical since its initiation. Apart from the medical and surgical skillfulness and a sound knowledge of therapeutics and immunobiology, organ transplantation success requires not to harm to the recipient (patient) as well as the donor. Successful transplant attempt gives life and quality life to the organ recipients, however, there are issues such as organ trafficking, organ tourism and commercialism that serves to threat practically and ethically. Human organ trafficking is one of the most wicked crime committed and is believed to be the most profitable business globally[1]. Transplant tourism is the travelling of the well-off individual suffering from life threatening and irrevocable organ failure to other country usually poor country for organ transplantation[2]. Although commercialism is a part of our daily life nowadays and it is indispensable to a certain extent however, transplant commercialism is not only dangerous for recipients but also to their donors, physicians, surgeons as well as community. The Declaration on Organ Trafficking and Transplant Tourism of Istanbul defines as "ya policy or practice in which an organ is treated as a commodity, including by being bought or sold or used for material gain"[3]. Before launching of the renal transplant rule, Pakistan became the centre for illegal renal transplant for many years that includes Pakistan in one of the top five culprit countries for organ trafficking.

The fundamental principles of bioethics such as non-maleficence, beneficence, health maximization, efficiency, respect for autonomy, justice are need to be in consideration before taking decisions for organ transplantation. The primary objective of the policy makers must be the health security of the recipients and the donors along with the integrity that should be respected. Every independent individual has the right to decide and make rational choices on his own benefit. However, assessment of risk and benefit are required for fair decisions and equality and equity among human beings.

Multiple factors has been involved in organ trafficking in Pakistan like poverty, unemployment, literacy, inaccessibility and unavailability of healthcare facilities, poor infrastructure and social services and neglecting the bill for human organ transplantation formulated in 2007 by Government of Pakistan. Organ trafficking and commercialism can be halt if implementation of the transplantation law follow efficiently. Health care facilities for the victims of organ trafficking especially post-operative cases should be improved.

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Instructions to Author

The Journal of Bahria University Medical and Dental College abbreviated as JBUMDC is a peer reviewed quarterly multidisciplinary biomedical journal of basic and clinical health sciences. It accepts manuscripts prepared in accordance with the "Uniform Requirements for Submission of Manuscripts for Biomedical Journals, updated December 2015", adopted by International Committee of Medical Journal Editors (ICMJE) & PMDC guidelines for medical & Dental journals. The Journal will encompass manuscripts from all fields of biomedical sciences in the form of Editorial (Invited/Editor), Original Article, Review Article (narrative reviews and systematic reviews), short communication, (Commentary), specical communication, brief report, recent advances, book review, personal views, case study, clinical images/visual vignette and letter to edtior.

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Type the manuscript on ISO A4 (212 × 297 mm), with margins of at least 25 mm (1 inch). Type or print on only one side of the paper. Use double spacing throughout the manuscript. Start each section on new page. Number pages consecutively, beginning with the title page. Put the page number in the lower right-hand corner of each page.

Contents of Manuscript for submission:

Submission items include a Covering letter, Letter of undertaking duly signed by all authors, Ethicel Review Committee (ERC) Letter, Title page and the Manuscript [Abstract, Key words, Introduction, Methodology, Results, Discussion, Conclusion, Acknowledgement, Authorship, Conflict of interest, References, Tables , Figures]**.** Title page should have complete title of the manuscript, the names of all authors with qualifications, their department, affiliation, telephone number, e-mail, corresponding author, address for correspondence, short running title, source of funding (grant/equipment/drugs), number of figures and tables, total word count, total number of pages.

1. Abstract

It should have no more than 150 words for unstructured abstracts or 250 words for structured abstracts. The abstract should state the purpose of the study(objective), basic procedures (methodology with study design, subjects/animals, place & duration of study, drug/chemical/equipment, procedure or protocol), main findings (results) and conclusion. It should emphasize new and important aspects of the study. Below the abstract provide, 3-10 key words that will assist indexers in cross-indexing the article and may be published with the abstract.

2. Introduction

State the purpose of the article and summarize the rationale for the study. Give only strictly pertinent references and do not include data or conclusions from the work being reported.

3. Methodology:

Describe your selection of the observational or experimental subjects (patients or laboratory animals, including controls) clearly. Identify the age, sex, and other important characteristics of the subjects. Identify the methods, apparatus (give the manufacturer's name and address in parentheses), and procedures in sufficient detail to allow other workers to reproduce the results. Identify precisely all drugs and chemicals used, including generic name(s), dose(s), and route(s) of administration. For randomized clinical trials provide information on all major study elements, including the protocol (study population, interventions or exposures, outcomes, and the rationale for statistical analysis), assignment of interventions (methods of randomization, concealment of allocation to treatment groups), and the method of masking (blinding). Authors submitting review manuscripts should include a section describing the methods used for locating, selecting, extracting, and synthesizing data. These methods should also be summarized in the abstract. All studies must be approved by the relevant Ethics Committee/Institution Review Board of the respective institutions.

4. Results

Present your results in logical sequence in the text, tables, and illustrations. Do not repeat in the text all the data in the tables or illustrations; emphasize or summarize only important observations. Describe appropriate indicators of measurement error or uncertainty such as confidence intervals, P values. Report complications of treatment and dropouts from a clinical trial. Specify any general-use computer programs employed for analysis.

5. Discussion and Conclusion

Emphasize the new and important aspects of the study and the conclusions that follow from them. Do not repeat in detail data or other material given in the Introduction or the Results section. Include in the Discussion section the implications of the findings and their limitations, including implications for future research. Relate the observations to other relevant studies. Link the conclusions with the goals of the study.

6. Acknowledgment

List all contributors who do not meet the criteria for authorship, such as a person who provided purely technical help, writing assistance, or a department chair who provided only general support. Financial and material support should also be acknowledged.

7. Authorship

Authorship credit is based only on the criteria laid down by International committee of Medical Journal Editors (http://www.icmje.org/recommendations/browse/roles-and-responsibilibies/defining-the-role-of-authore-and-contributors. html).1) substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; 2) drafting the article or revising it critically for important intellectual content; and 3) final approval of the version to be published. 4) Agreement to be Accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All Conditions must be met. Authors should provide a description of what each contributed.

8. Conflict of interest

All authors have to disclose and submit any financial /personnel relationship that might bias and inappropriately influence their work.

9. References

Majority of the references must be from last five years. Local references must also be included. Vancouver style should be followed. Examples are:

a) Standard journal article

List the first six authors followed by et al.
I)Less than 6 authors:

Vega KJ, Pina I, Krevsky B. Heart transplantation is associated with an increased risk for pancreato-biliary disease. Ann Intern Med 1996; 1;124 (11):980-3

II) More than six authors:

Parkin DM, Clayton D, Black RJ, Masuyer E, Friedl HP, Ivanov E, et al. Childhood leukaemia in Europe after Chernobyl: 5 year follow-up. Br J Cancer 1996;73:1006-12

b) Organization as author

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

c) No author given

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

d) Chapter in a book

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

e) Newspaper

Hasan Mansoor. Excessive use of drugs creating resistance to antibiotics. The Dawn 2013, 24 June; sect. Metropolitan (col.1-4)

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Type or print out each table with double spacing on a separate sheet of paper. Number tables consecutively in the order of their first citation in the text and supply a brief title for each. Give each column a short or abbreviated heading. Place explanatory matter in footnotes. Explain in footnotes all nonstandard abbreviations that are used in each table. Identify statistical measures of variations, such as standard deviation and standard error of the mean. Do not use internal horizontal and vertical rules.

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Units of Measurement

Measurements of length, height, weight, and volume should be reported in metric units. Temperatures in degrees Celsius, Blood pressure in millimeters of mercury and all hematologic and clinical chemistry measurements in the metric system in terms of the International System of Units (SI).

Abbreviations and Symbols

Use only standard abbreviations. Avoid abbreviations in the title and abstract. The full term for which an abbreviation stands should precede its first use in the text unless it is a standard unit of measurement.

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2	Review Article	Unstructured (150)	3-6	3000-3500	40-60	4	2
3	Original Article	Structured (250)	3-10	2500-3000	20-30	4	3
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		3. Reproducible work (guide lines, questionnaire)	Mention Source, Accessed on, Retrieval date				
5	Short Communication /Commentary/ Opinions/ Perspective	-	-	1200-1500	15-20	2	1
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